



IRISH CATTLE BREEDING FEDERATION

Developments in ICBF Beef €uro-Stars.

Industry Consultation
Meeting.

26th April 2012.



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Agenda

- Background & recommendations – Michael.
- Economic values – Paul/Noirin.
- Impact on current Indexes – Ross.
- Index options - Andrew
- Future research – Andrew
 - Accuracy of maternal proofs – Noirin/Andrew
- Presentation, publication & roll-out – Andrew.



1. Background.

- Euro-Stars introduced in 2007.
- Facilitating gain in terminal traits.
- Concern re: maternal traits.
- Request for original group to be reformed
- Terms Reference: *To advise on the further development of information services (Euro-Stars) provided by ICBF to support the breeding of more profitable beef cattle in Ireland*".

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Approach taken.

- Team of 13 people; stakeholders (7) and technical support (6).
- Series of six meetings.
- Submissions from industry.
- Process: Economic values -> impact on indexes -> index selection -> recommendations.
- Today is overview of the process.

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Recommendation (1)

Economic Values.

- To use the Teagasc Grange Farm Systems model as the basis for future development in economic values for ICBF beef Euro-Star system's.
- To incorporate three new traits into future economic indexes (polledness, docility and meat eating quality premium).

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Recommendation (2)

Construction of Indexes (i)

- To introduce a new **Terminal** index, for the identification of sires suitable for breeding high profit animals (males and females) for slaughter. This index would replace the current weanling export sub-index and carcass sub-index. It would be published in the units of €/progeny.

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Recommendation (2)

Construction of Indexes (ii)

- To introduce a new **Maternal** index, for the identification of animals (sires and/or suckler female replacements), suitable for breeding and selecting high profit replacement females. The index would replace the current milk and fertility sub-index. The index would include maternal cow traits and terminal traits and would be published in the units of €/progeny.

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Recommendations (2)

Construction of indexes (iii)

- To introduce a new **Dairy** beef index, for the identification of sires suitable for use on dairy cows. The index would be published in units of €/progeny.
- To cease publishing the Suckler Beef Value as an overall index and instead promote the appropriate use of the above three indexes.

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Recommendations (3)

Future research work (i)

- ICBF and Teagasc to continue development work on economic values and traits of interest, with this work reported through regular herdbook and industry consultation meetings. Priority areas of work include; (i) stock bull functionality (trait and economic value), (ii) calving and docility (non-linearity of economic values), (iii) calving traits, including the use of birth weigh data (trait and economic value), (iv) feed intake/efficiency for suckler females (trait and economic value), (v) premiums for meat eating quality, (trait and economic value) and (vi) sensitivity of economic values to changes to the definition of systems (e.g., calf to steer system versus bull beef system).

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Recommendations (3)

Future research work (ii)

- ICBF and Teagasc to work with industry stakeholders regarding accuracy of Maternal evaluations, with these results reported through regular herdbook and industry consultation meetings.
 - Opportunity to meet directly with individual stakeholders.

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Recommendations (4). Presentation, publication & roll-out.

- That an implementation group be established to oversee the presentation, publication and roll-out of these new indexes.

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Economics of production traits for beef breeding indexes

Paul Crosson

Livestock Systems Research Department, Animal & Grassland Research and Innovation Centre,
Teagasc, Grange

Presentation at ICBF industry meeting, 26 April 2012

Objective

- To assign economic values to the breeding traits that affect profitability so that breeding indexes can accurately reflect economic gains made at farm level by improving these traits



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Farm system overview

Farm area (ha)	40.0
Cows calving	65.7
Farm stocking rate (organic N/ha)	210
Weaning weight – mean of heifers and steers (kg)	317
Carcass weight – mean of heifers and steers (kg)	372
Mature cow weight (kg)	611
Percentage grass	62%
Percentage silage	30%
Percentage concentrate	8%
Mean annual R3 steer price (€/kg)	3.78
Gross margin per cow calving (€)	492
Gross margin per ha (€)	809
Net margin per cow calving (€)	127
Net margin per cow calving* (€)	-942

*Including land and labour



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Output traits

1. Weight for age (carcass weight)
2. Maternal weaning weight (milk effect)



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Calculation of weanling and beef prices

- Beef price = €3.78/kg = ~€2.16/kg live
 - Need to add premium to calculate weanling price
- ICBF weanling prices 2007-2011:
 - Males, €1.97/kg live; Heifers, €1.84/kg live
- Bord Bia beef prices 2007-2011:
 - Males, €3.19/kg carcass; Heifers, €3.26/kg carcass
- Weanling premium: males, 10.2%; heifers, 1.1%



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Maternal weaning weight

- **Calculations:**
 - pre-weaning calf performance increased by 10% compared to the base scenario
 - output increased but milk production costs also increased
 - $EV = (\text{increase in output} - \text{increased milk feed costs}) / \text{increase in weaning weight}$

Economic value = €1.74/kg live



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Maternal weaning weight - example

- Suckler cows with a maternal weaning weight advantage of 25 kg
- Progeny of these cows increase profitability by:
 - $25 \text{ kg} \times €1.74/\text{kg live} = €43.50 \text{ per weanling}$
 - For a cow herd producing 50 weanlings, this is worth
 - $€43.50/\text{head} \times 50 \text{ weanlings} = €2,175$



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Weight for age (carcass weight)

- Economic value = €3.78/kg carcass
- Weanling premium ~ cost for finishing system of €51/head
- Carcass weight = 391 kg = €0.13/kg carcass
- Revised EV = €3.78 – €0.13 = €3.65/kg carcass



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Production cost traits

1. Progeny intake
2. Cow mature weight
 - Heifer intake
 - Cow intake
 - Cull value
3. Gestation length
4. Calving difficulty



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Progeny feed intake

- Increase in feed costs arising from heavier progeny
 - economic value = increased feed costs / increased feed demand = -€0.16/kg DM
- Example:
 - Comparing two yearlings from turnout to housing and then to finish
 - Average liveweights of 500 kg and 550 kg
$$€0.16/\text{kg DM} \times 1 \text{ kg DM intake (@ 2\% of BW)} = €0.16/\text{day per head}$$
$$\text{Over 300 days} = €48 \text{ per head}$$

Mature weight – heifer intake

- Heavier cow herd requires heavier heifers at breeding and calving
 - Thus, this traits accounts for increase in heifer feed costs per kg change in cow mature weight (expressed as carcass)
 - Economic value is -€2.28/kg carcass

Mature weight – cow intake

- Heavier cow herd have greater maintenance costs
 - Thus, this traits accounts for increase in feed costs per kg change in cow mature weight (expressed as carcass)
- Economic value is -€0.571/kg carcass

Cow mature weight – cull value

- Heavier cows result in greater cull values
- Cull value equals the cull price payable
- Thus, economic value is €3.04/ kg carcass

Cow mature weight – Example

Mature weight	600 kg	700 kg	Diff
Cow intake EV	€0.57/kg carcass	€0.57/kg carcass	
Maintenance cost	€171/cow	€200/cow	-€29/cow
Heifer intake EV	€2.28/kg carcass	€2.28/kg carcass	
Heifer cost	€684/heifer	€798/heifer	
Per cow	€137/cow	€160/cow	-€23/cow
Cull EV	€3.04/kg carcass	€3.04/kg carcass	
Per cow	€182/cow annually	€213/cow annually	€31/cow
Overall impact			-€21/cow (-€0.21/kg)
50 cow herd			-€1,050/farm

Gestation length

- Direct effect of gestation length on farm margin
- Four components:
 - increase replacement rate (increase by 0.24% per day; Amer et al., 2001)
 - reduce age at weaning (and slaughter) by one day
 - reduce the length of the grazing season for suckler cows by one day BUT
 - Lighter progeny = lower feed costs
- Economic impact:
 - Reduction in margin/cow of €1.72 for each day increase in GL

Example of effect of gestation length

- Using a bull with an expected GL of 288 days
 - Mean for late maturing sires is 286 days – thus 2 days

longer GL

- Bull breeds 50 calves on a farm in a year:

$$2 \text{ days} \times \text{€}1.72 \text{ per day} \times 50 \text{ calves} = \text{€}172/\text{farm}$$



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Calving difficulty

- Higher costs (replacement heifer, labour and veterinary) have led to increased calving difficulty costs

Trait	Modelled
Direct calving difficulty (€/‰ change)	-5.31
Maternal calving difficulty (€/‰ change)	-2.29



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Fertility traits

1. Survival
2. Calving interval
3. Age at first calving



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Cow survival

- Comparing two replacement rates
 - Lower sales of prime beef (lower numbers and lighter carcasses (since more of the progeny are from first calvers))
 - Higher labour costs at calving for heifers BUT
 - Increase in sales of cull beef
 - Lower feed costs (lighter progeny)
- Economic impact:
 - reduce margins by €4.00/cow for each % increase in replacement rate



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Example of effect of survival

- Comparing two cow herds with replacement rates

of 16% and 20%

- For a cow herd of 50 cows & calves the impact is

$$4 \times \text{€}4.00 \text{ per percent unit change} \times 50 \text{ cows} =$$

€800/farm



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Calving interval

- Change in calving pattern
 - Using industry data – stratified based on varying percentages of the herd calved in the first 75 days and varying calving intervals
 - Shows lighter carcass weights and higher feed costs when modelled
 - Corresponding differences in CI and profitability
 - Economic value = change in profit/change in CI = -€2. 20



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Example of effect of calving interval

- Comparing two cow herds with calving intervals of

365 vs. 400

- For a cow herd of 50 cows & calves the impact is

35 days x €2.20 per day x 50 cows = €3,850/farm



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Age at first calving

- Calculations:
 - age at first calving of 24 months of age compared to 36 months of age
 - increase feed requirements (land area required)
 - EV = change in profitability per additional day of age at calving = -€1.65/heifer calving



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Example of effect of age at first calving

- Comparing two cow herds with heifers first calving

at 28 and 30 months

- For a cow herd of 50 cows with 10 first calving heifers

$$62 \text{ days} \times \text{€}1.65 \text{ per day} \times 10 \text{ heifers} = \text{€}1,023/\text{farm}$$



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Current and revised EVs

Trait	Current	Proposed
Gestation length (€/day)	-2.12	-1.72
Direct weaning weight (€/kg live)	1.80	-
Direct carcass weight (€/kg carcass)	3.20	3.78
Progeny intake (€/kg DM)	-0.13	-0.16
Survival (€/ % decrease)	2.94	2.04
Calving interval (€/day)	-1.37	-2.20
Age at first calving (€/day)	-0.96	-1.65
Maternal weaning weight (€/kg live)	1.80	1.74
Mature weight - heifer intake (€/kg carcass)	-1.22	-2.28
Mature weight - cow intake (€/kg carcass)	-0.41	-0.57
Mature weight - cull value (€/kg carcass)	2.80	3.04
Direct calving difficulty (€/ % change)	-2.96	-5.31
Maternal calving difficulty (€/ % change)	-1.81	-2.29



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Summary

Trait	Current	Proposed
5. Key output trait increased		
Direct carcass weight (€/kg carcass)	3.20	3.78
4. Calving interval trait increased		
Calving interval (€/day)	-1.37	-2.20
Age at first calving (€/day)	-0.96	-1.65
Maternal weaning weight (€/kg live)	1.80	1.74
Mature weight - heifer intake (€/kg carcass)	-1.22	-2.28
Mature weight - cow intake (€/kg carcass)	-0.41	-0.57
Mature weight - cull value (€/kg carcass)	2.80	3.04
Direct calving difficulty (€/ % change)	-2.96	-5.31
Maternal calving difficulty (€/ % change)	-1.81	-2.29



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Summary

Trait	Current	Proposed
Gestation length (€/day)	-2.12	-1.72
Direct weaning weight (€/kg live)	1.80	-
3. Survival trait increased (labour)		
Survival (€/ % decrease)	2.94	4.00
Calving interval (€/day)	-1.37	-2.20
Age at first calving (€/day)	-0.96	-1.65
Maternal weaning weight (€/kg live)	1.80	1.74
Mature weight - heifer intake (€/kg carcass)	-1.22	-2.28
Mature weight - cow intake (€/kg carcass)	-0.41	-0.57
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Maternal calving difficulty (€/ % change)	-1.81	-2.29



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Summary

Trait	Current	Proposed
Gestation length (€/day)	-2.12	-1.72
2. Feed cost traits increased		
Progeny intake (€/kg DM)	-0.13	-0.16
Survival (€/ % decrease)	2.94	2.04
Calving interval (€/day)	-1.37	-2.20
Age at first calving (€/day)	-0.96	-1.65
Maternal weaning weight (€/kg live)	1.80	1.74
Mature weight - heifer intake (€/kg carcass)	-1.22	-2.28
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Direct calving difficulty (€/ % change)	-2.96	-5.31
Maternal calving difficulty (€/ % change)	-1.81	-2.29



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Summary

Trait	Current	Proposed
Gestation length (€/day)	-2.12	-1.72
1. Calving difficulty value much more negative		
Progeny intake (€/kg DM)	-0.13	-0.16
Survival (€/ % decrease)	2.94	2.04
Calving interval (€/day)	-1.37	-2.20
Age at first calving (€/day)	-0.96	-1.65
Maternal weaning weight (€/kg live)	1.80	1.74
Mature weight - heifer intake (€/kg carcass)	-1.22	-2.28
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Direct calving difficulty (€/ % change)	-2.96	-5.31
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Next steps

- Sensitivity of economic values to price and production system changes
- Integration of new traits into the Grange Beef Systems Model
- Further analysis of existing traits (maternal) and new traits (meat quality, nutrient partitioning, etc.)



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**Thank you
Questions?**

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A beef index for dairy cows

N McHugh, S McParland, A Cromie
& P French



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Background

- Currently 60% of dairy cows are bred to dairy bulls
- Increase in the dairy cow population of 4-5% per annum from 2011 → 1.65 million by 2020
- Substantial increase in beef cross calves from the dairy herd
- Sexed semen → reduction in the use of dairy bulls → increase proportion bred to beef bulls



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Objective:

Develop a breeding index for dairy farmers → select beef bulls



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Requirements for developing an index

1. Knowledge of the traits of interest
2. Genetic parameters for the traits:
 - Heritability estimates
 - Genetic variation
3. Economic values for each traits



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Traits influencing decision

Calving difficulty

Calf mortality

Gestation length

Calf price

Suckler cow breeding value – will the dairy farmer be rewarded?



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Economic Values



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Calving difficulty

- Currently - €6.01 per % increase in the proportion of difficulty calvings per cow calving
- Accounts for costs associated with:
 - labour, vet
 - dead calf, dead cow
 - barren cow



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Calving difficulty

	Caesarean	Vet called	No vet called	Slight
Stockman hours (@ €20.18/hr)	6	4	4	1
Veterinarian	Should this be treated as a linear effect??			
Probability of a dead cow (@ €1411/cow)	0.09	0.07	0.07	0.01
Reduced reproductive success (@ €1020/cow)	0.08	0.01	0.01	0.01
Lost milk (litres; @ €0.27/litre)	683.75	160.23	160.23	61.83
Calving interval (days; @ €3/day)	Economic value: -€6.01			6.34
Number of services (@ €10/service)	0.55	0.14	0.14	0.06
Calving cost relative to no assistance	921	358	273	93

Economic values

Calf mortality

- Accounts for stillborns and calves dying **before 28 days of age:**
 - A dead calf plus knacker cost €15
 - Taken as the calf price at birth (€211 average price 2010-2012)
- Currently **-€2.26** per 1% increase

Economic values

Gestation length

- Currently **-€2.30** per day per cow calving
- Accounts for:
 - Loss in milk sales
 - Change in the feed budget

Economic values

Calf price

- €1.00
- Economic value implicitly assumed within the EBV of calf price



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EBVs - calf price

- Males and females from dairy cows
- Age 2 - 84 days
- Price €2- 450 weight unknown

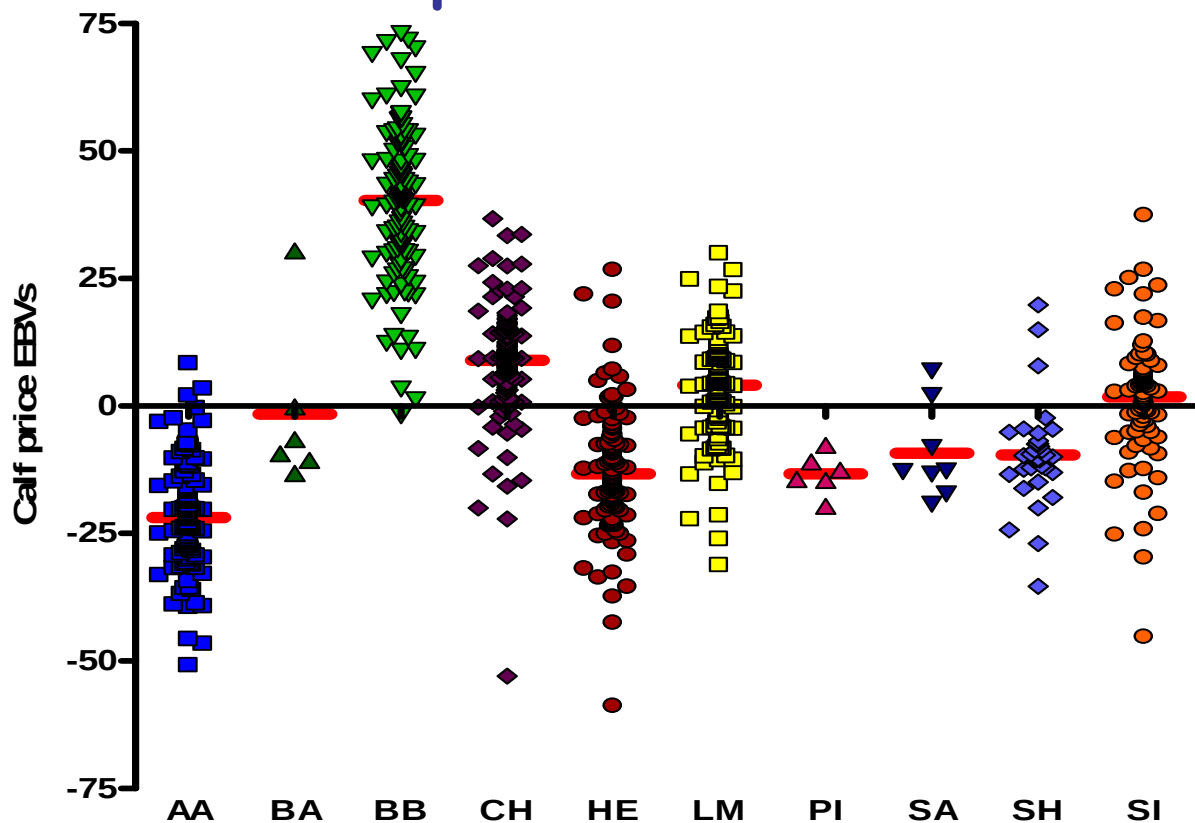
	2009		2010		2011		
	Female	Breed Proportions:				Female	Male
AaX	102	AA 38%				187	214
BbX	225	He 27%				301	328
ChX	209	BB 20%, LM 11%				305	351
HeX	128					223	257
LmX	145	184	146	182		234	267
SiX	172	213	165	212		264	287

EBVs - calf price

- Range -€59 to €73
- Breed averages

breed	EBV
AA	-21.85
BA	-1.61
BB	40.38
CH	9.01
HE	-13.36
LM	4.11
PI	-13.31
SA	-9.30
SH	-9.58
SI	1.82

EBVs - calf price



Derivation of index

EBVs already available for direct calving difficulty, stillbirth and gestation length

Simply multiply these by respective economic weightings

Sum up all values:

$$\text{Index} = -6.01 * \text{EBV}_{\text{calving}} - 2.26 * \text{EBV}_{\text{mortality}} - 2.30 * \text{EBV}_{\text{gestation}} + 1 * \text{EBV}_{\text{calf_price}}$$



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Results to date...

Dairy beef index favours selection on bulls with high EBVs for calf price (i.e. BB bulls)

Not enough emphasis placed on calving difficulty

- Bulls with high calving difficulty appearing at top of the list

More research:

- non-linear effect of calving difficulty
- Functionality of bulls



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4. Impact of new Economic Values.

- Comparison of indexes.
- Example bulls.
- Impact of changes.

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Comparison of Indexes.

Euro-Indexes		SBV - Current			SBV - New			New Maternal			New Terminal		
Index	Traits	EV	% wt	% wt	EV	% wt	% wt	EV	% wt	% wt	EV	% wt	% wt
Calving	Calving Difficulty	-2.46	72		-5.31	87		-5.31	87		-5.31	87	
	Gestation Length	-2.37	19	9	-1.72	8	14	-1.72	8	8	-1.72	8	32
	Calf Mortality	-5.34	9		-5.34	5		-5.34	5		-5.34	5	
Weanling Export	Weaning Weight	1.55		4						0			0
	Calf Quality	2.58				0							
Beef Carcass	Weaning Weight	1.55											
	Carcass Weight	2.5	46		2.95	56		2.95	56		2.95	56	
	Carcass Conf	11.45	12	36	14.8	16	29	14.77	16	17	14.8	16	68
	Carcass Fat	-6.49	6		-7.86	7		-7.86	7		-7.86	7	
	Feed Intake	-0.1	17		-0.12	21		-0.12	21		-0.12	21	
Daughter Fertility	Cow Survival	16.6	30		22	27		22	27				
	Calving Interval	-7.51	33	10	-12.1	37	12	-12.1	37	23			0
	Age at First Calv	-1.38	28		-1.96	28		-1.96	28				
	Maternal CD%	-9.98	10		-12.6	9		-12.6	9				
Dau Milk	Maternal Wean WT	9.9	100	11	9.96	100	9	9.96	100	19			0
Maternal Calf Calving	Calving Difficulty	-9.22			-19.9			-19.9					
	Gestation Length	-8.86		10	-6.43		15	-6.43		14			0
	Calf Mortality	-20			-20			-20					
Maternal Calf Beef	Carcass Weight	6.14			7.26			7.26					
	Carcass Conf	28.18		21	36.4		21	36.35		19			
	Carcass Fat	15.98			-19.4			-19.4					
	Feed Intake	-0.24			-0.31			-0.31					

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Impact of EV's – CF43 vs TOH

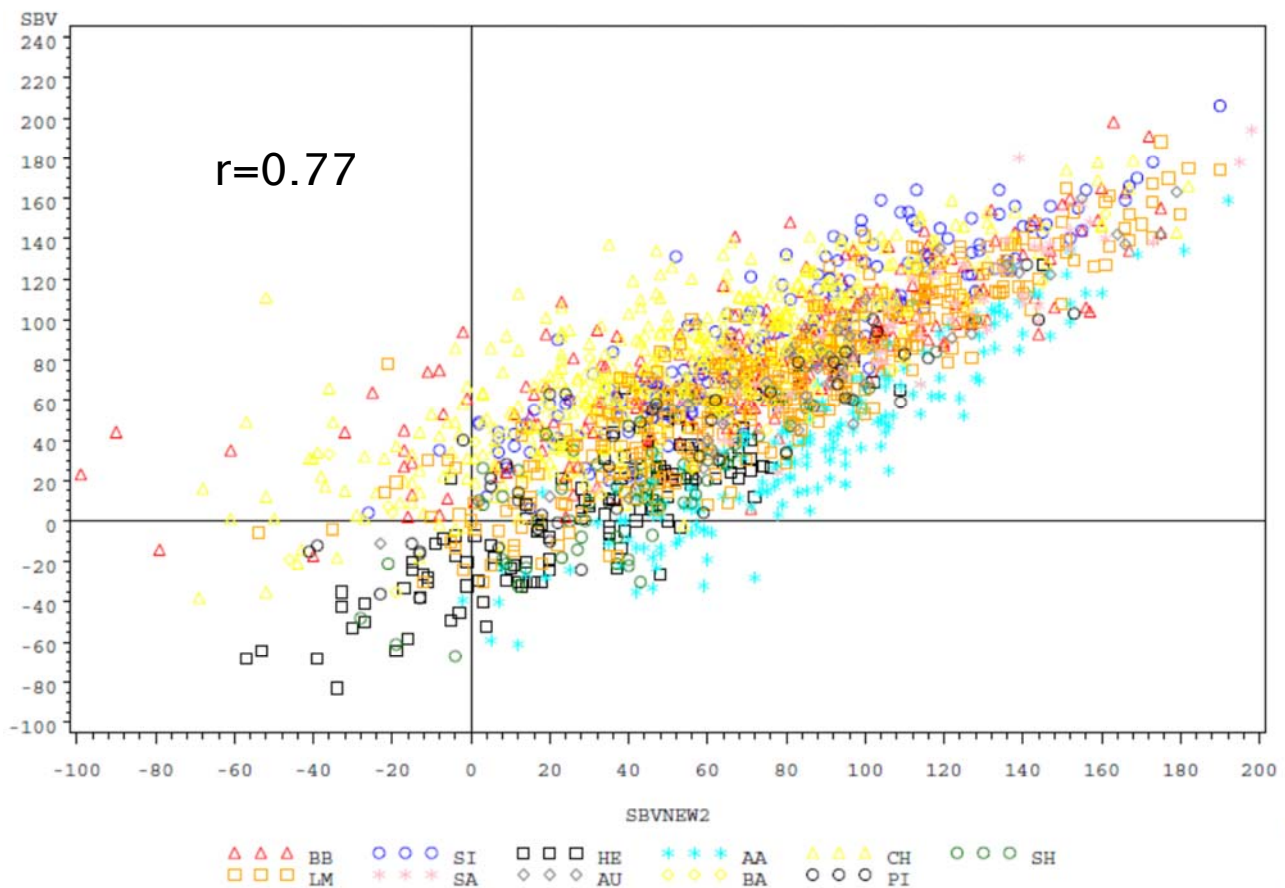
Trait	Economic Values		CF43			TOH		
	Current	New	PTA	€	€-value	PTA	€	€-value
Calving diff*	-€2.96	-€5.27	4.4	€3	€7	15.3	-€18	-€38
Gestation*	-€2.12	-€1.72	1.9	-€3	-€2	2.1	-€4	-€3
Mortality*	-€5.34	-€5.34	-0.1	€1	€1	1.5	-€6	-€6
Weaning weight*	€1.80	€1.80	4.9	€1	€1	21.8	€5	€5
Weanling price per kg	€3.00	€3.00	24.7	€10	€10	34.5	€13	€13
Feed intake*	-€0.13	-€0.16	0.4	-€9	-€11	0	-€1	-€1
Carcass wt*	€3.20	€3.78	26.4	€41	€46	35.6	€55	€61
Carcass conf*	€14.67	€18.93	1.8	€12	€16	2	€14	€19
Carcass fat*	-€6.49	-€7.86	0.2	-€1	-€1	-1.1	€4	€5
Age 1st Calving	-€0.96	-€1.63	-20	€6	€11	8.7	-€3	-€5
Maternal cdiff	-€1.81	-€2.29	5.9	€0	€0	3.9	€5	€6
Maternal wean wt	€1.80	€1.81	1.7	€4	€4	-3.3	-€7	-€8
Calving interval	-€1.37	-€2.20	-5.7	€10	€16	3.3	-€6	-€9
Survival	€2.94	€4.00	2	€8	€10	0.8	€3	€4
Mature wt heifer intake	-€1.22	-€2.28		-€6	-€11		-€20	-€37
Mature wt cow intake	-€0.41	-€0.57		-€8	-€11		-€25	-€35
Cull cow wt	€2.80	€3.04	14.8	€7	€8	48.4	€24	€26
Maternal Calf				€48	€52		€67	€26
Overall				€128	€151		€122	€45

Impact on indexes.

	SBV	SBV_new	SBV_new+3 traits
SBV	1.00		
SBV_new	0.78	1.00	
SBV_new+3 traits	0.77	0.98	1.00

- SBV = Current Suckler Beef Value.
- SBV_new = Current Suckler Beef Value with new economic values.
- SBV_new+3 traits = Current Suckler Beef Value with new economic values and 3 new traits

SBV current vs SBV new EWs plus 3 new traits



Selecting Top100 bulls.

	Calving Diff%	Carcass wt kg	Carcass conf (1-15)	Calving Int days	Maternal Milk kg	Maternal CD%
SBV	6.4	28.4	1.73	0.5	5.9	6.6
SBV_new	4.7	24.9	1.7	-1	7.3	7.1
SBV_new +3 traits	4.7	24.8	1.69	-1.1	7.7	7.4

- New economic values will result in:
 - Less calving problems, better fertility & more milk.
 - Less genetic gain in carcass traits

4. Selection of indexes.

- Submissions invited from stakeholders.
- Excellent feedback and pointers.
- Discussed at industry and herdbook technical meetings.

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Submissions - Key feedback.

- Focus on maternal & cost of production traits.
- Maternal and terminal indexes, only some support for an overall index.
- Request for a dairy beef index.
- Continue with Euro-Stars, but greater differentiation.

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Indexes – Key questions.

- Terminal – Which traits. Can this index replace weanling export and carcass?
- Maternal – how much weight on “pure” maternal? Do we need a separate index for females?
- Overall – do we need an overall?

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Terminal Index.

- Cost of calving (CD%, gestation length & mortality) should be included.
- Correlations between New terminal & weanling export & carcass are high (~0.70).

	Weanling export	Carcass	New Terminal
Weanling export	1.00		
Carcass	0.88	1.00	
New Terminal	0.61	0.83	1.00

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Maternal & overall Index.

Five indexes considered.

- **SBV_New_+3traits** - Suckler Beef Value, new economic values, new traits. 23% weighting on maternal index.
- **Terminal** - New terminal index. Includes calving, carcass weight for age, carcass conformation, fat score, and feed intake.
- **Maternal** - New maternal index. Includes Terminal + Maternal Cow traits. Maternal cow = Maternal milk, CI days, Survival%, Age at first calving, maternal calving difficulty and cull cow weight.
- **Maternal Cow** - Maternal cow traits only.
- **Commercial Heifer replacement** - Maternal cow + component of direct calving and terminal, reflecting the value of progeny.

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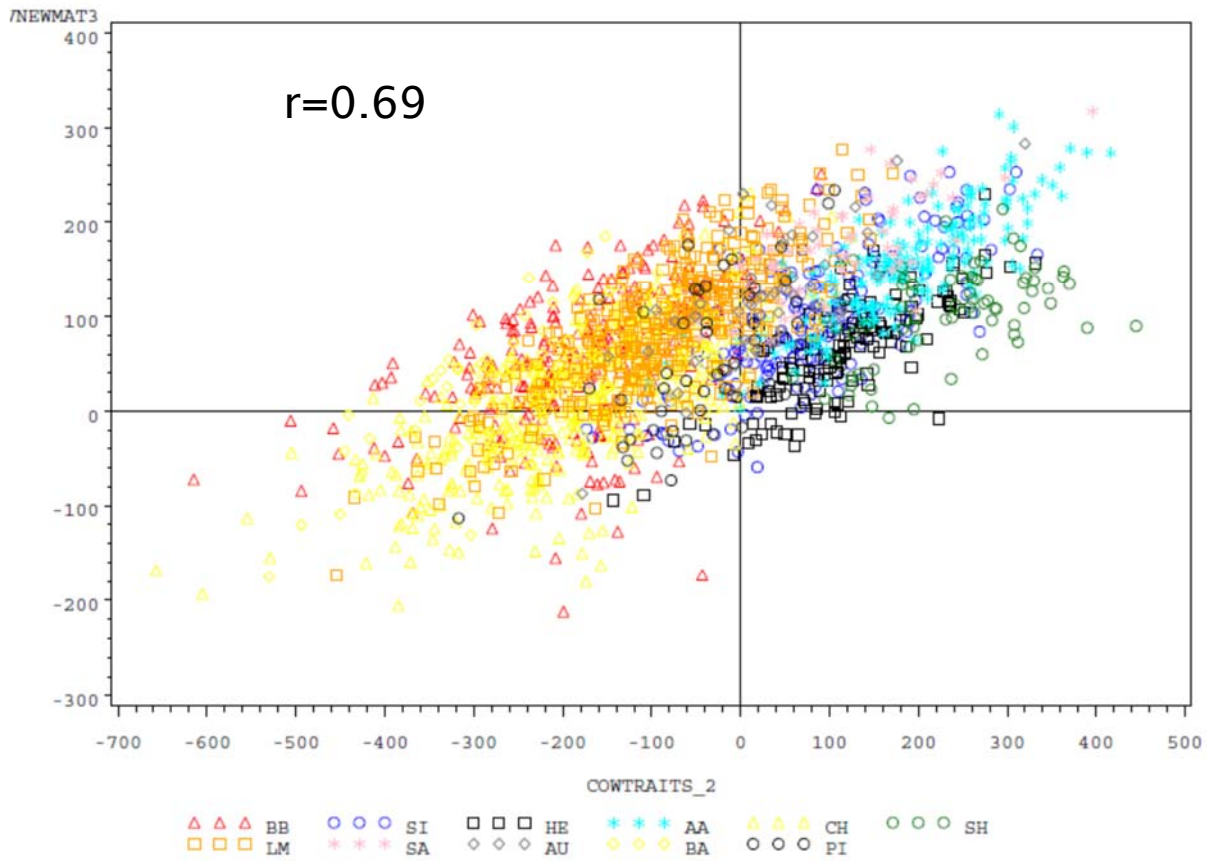
Correlations in indexes.

	SBV_new+3 traits	Terminal	Maternal	Maternal Cow	Comm heifer Replacement
SBV_new+3 traits	1.00				
Terminal	0.58	1.00			
Maternal	0.88	0.19	1.00		
Maternal Cow	0.31	-0.57	0.69	1.00	
Heifer Replacement	0.50	-0.39	0.83	0.98	1.00

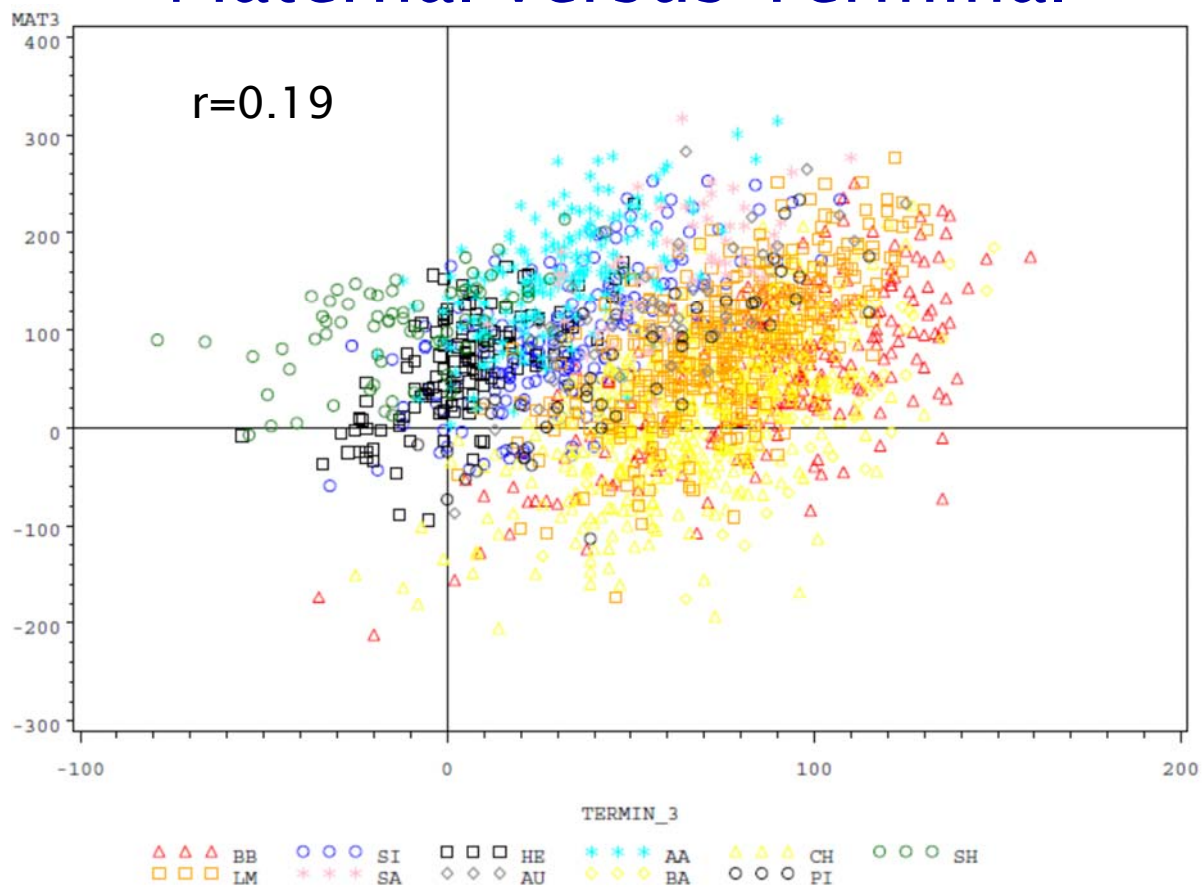
70



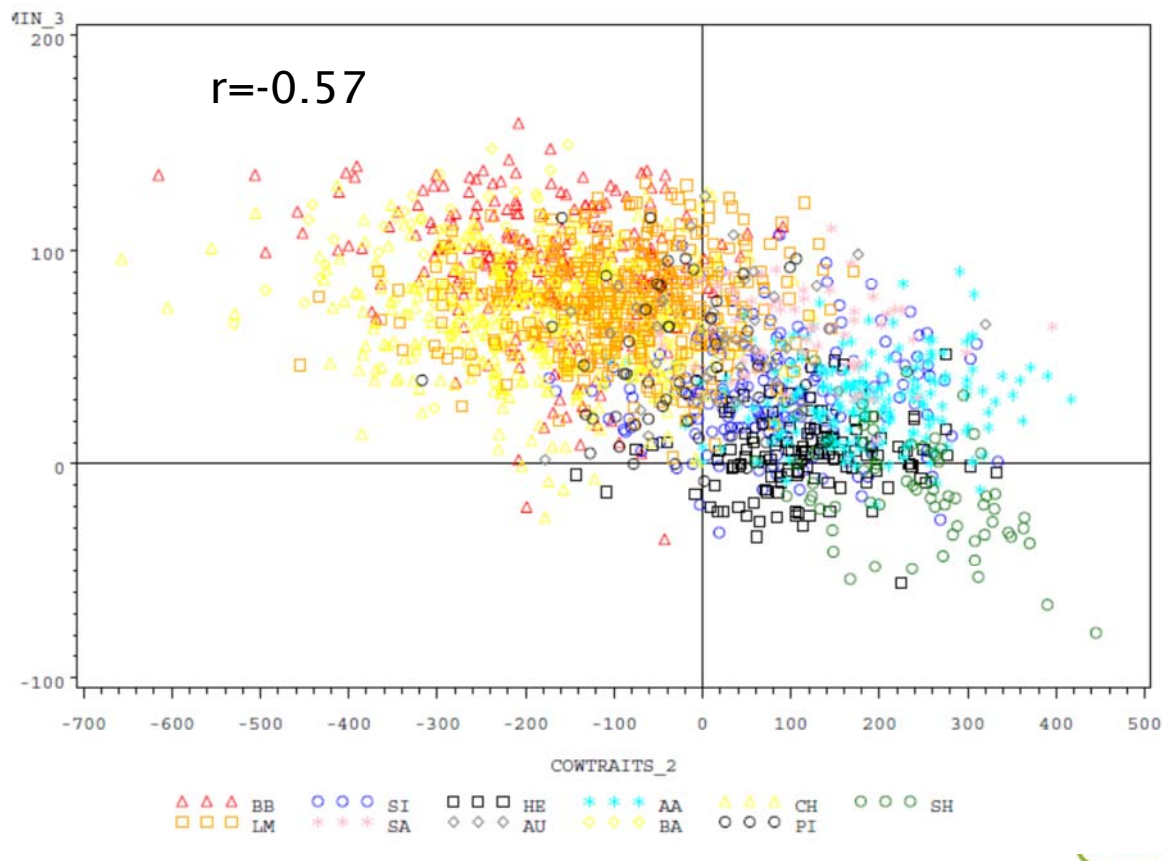
Maternal versus Maternal Cow



Maternal versus Terminal



Maternal Cow versus Terminal



Selecting top 100 bulls. Impact on key traits.

	Calving Diff%	Carcass wt kg	Carcass conf (1-15)	Calving Int days	Maternal milk kg	Maternal CD%
SBV_new+3 traits	4.7	24.8	1.7	-1.1	7.7	7.4
Terminal	6.7	28.3	2.3	2.8	0.4	9.9
Maternal	3.8	18.6	1.3	-2.9	11.4	7.5
Maternal cow	3.4	2.9	0.5	-6.1	13.8	8.1
Comm heifer replacement	3.1	6.3	0.7	-5.7	14.1	8.1

- Maternal – improvements across all traits.
- Maternal cow – big reductions in terminal traits.

Selecting top 100 bulls. Impact on farm profit.

	SBV_new + 3 traits	Terminal	Maternal	Maternal Cow	Comm Heifer replacement
SBV_new+3 new traits	€162	€101	€221	€78	€512
Terminal	€128	€126	€133	-€179	-€174
Maternal	€155	€78	€234	€180	€747
Maternal cow	€94	€13	€179	€298	€910
Comm Heifer replacement	€114	€30	€204	€288	€930

- Maternal – 80% & 82% of gain in pure maternal & heifer replacement. 95% of gain in overall profit.
- Maternal cow – losses in overall profit to large (-42%).

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Outcomes.

- New terminal index.
- New maternal index.
 - For selection of bulls and replacement females.
 - Maternal = Maternal Cow + Terminal.
- No requirement for an overall index.

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Priorities for future research

- Stock bull functionality.
- Calving and docility (non-linearity of economic values),
- Calving traits, including the use of birth weigh data. Maternal Calving Difficulty.
- Feed intake/efficiency for suckler females
- Premiums for meat eating quality,
- Sensitivity of economic values to changes to the definition of systems (e.g., calf to steer system versus bull beef system).
- Others.....

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Presentation, publication & roll-out.

- Initial work undertaken.
 - Catalogue – index page & main page.
 - Conference – major Teagasc/ICBF conference planned for September.
 - Marts – “Flagging” 4 & 5 star maternal females at time of mart sale.
- Establishment of implementation group.

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Summary.

- Rigorous, transparent process followed.
- Group are positive about outcomes.
 - Increased focus on maternal and cost of production traits.
 - Continued improvement in terminal traits.
- Move to implementation ahead of Autumn breeding season.