



Understanding New Beef Indexes

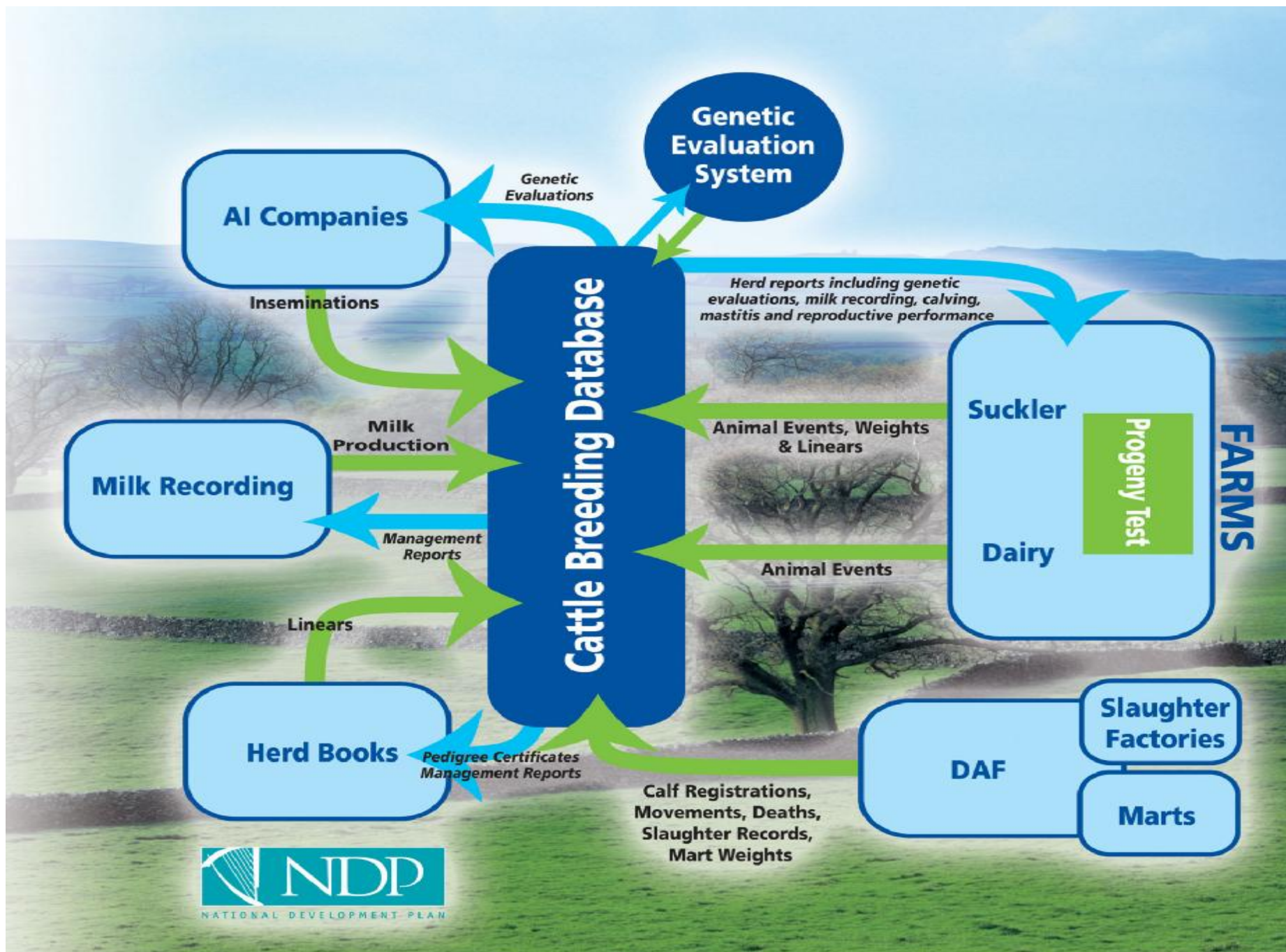
***Irish Angus Munster Branch
Hibernian Hotel, Mallow, March 2006***



Introduction



- Price of product is constant or decreasing but costs of production are increasing
- Genetic improvement is **proven to increase profitability**
- Genetic improvement is permanent & cumulative
- Aim of new Beef Indexes is to identify the best animals so breeders can maximise profitability



Bull Details				Progeny Test (EPD)					Tully	On-Farm BLUP			Calving Survey		Sen
Code	BULL NAME	AI station	Breed	Rel	Growth Kgs	Conf Score	Fat Score	% Kill Out	FCE	Rel	Muscle	Skeleta;	% CD	GL Days	Price
BJP	BOHEY JASPER	PG/NW	AA	0.57	9.2	0.74	0.48	1.96	.	.	.	.	3.5	279	€ 8
DVE	DRUMDEEVIN DANCER	PG/NW	AA	0.66	8.5	0.68	0.39	0.94	.	.	.	.	1.7	280	€ 8
KJE	KBJ JETTA 64 D	PG/NW	AA	0.58	19.2	0.69	0.36	1.50	.	.	.	.	6.3	281	€ 8
LHL	LAHEENS LARRY	DOVEA AI	AA	0.67	1.0	0.50	0.34	0.89	.	.	.	.	1.3	281	€ 8
LJP	LAVALLY JACKPOT	PG/NW	AA	0.50	13.1	0.62	0.50	1.36	92	.	.	.	2.6	279	€ 6
MTL	MINIT OF LISS	PG/NW	AA	0.50	7.9	0.79	0.55	1.46	134	.	.	.	1.0	279	€ 8
PBO	PROUD BOY OF DUNLEVER	PG/NW	AA	0.59	-0.3	0.57	0.29	1.72	.	.	.	.	1.6	280	€ 8
RHG	RAINBOW HILLS GOVERNOR 128X	PG/NW	AA	0.55	12.6	0.61	0.36	1.69	.	.	.	.	8.8	281	€ 10
RHD	RAINBOW HILLS INDEPENDENCE 117	PG/NW	AA	0.65	14.7	0.89	0.46	2.33	.	.	.	.	3.3	281	€ 10
RUH	ROOSE ULAH														€ 8
AVT	AVIATEUR DU														€ 8
JOK	JOKER DU PO														€ 8
BIG	BUTINEUR DU														€ 8
NEZ	NOTEZ LE ET														€ 8
FPS	FRIPON DE SC														€ 8
GUY	GENERAL DU														€ 10
NRO	NERO														€ 8
TIY	TINTIN DE MY														€ 10
VDC	VICTORIEUX D														€ 12
BSK	BARRACKS DU														€ 8
CF44	DOONALLY CF														€ 8
CF43	DOONALLY DO														€ 8
CF49	DOONALLY FA														€ 8
CF46	DOONALLY FA														€ 8
CF47	DOONALLY FE														€ 8
CF48	DOONALLY FL														€ 8
CF41	ENFIELD CLOV														€ 8
HKI	HARA KIRI														€ 12
HWN	HOLLOWTREE														€ 8
KFC	KNOCKANE FL														€ 8
MDO	MOGADOR														€ 8
BWT	BAWNGARRIF														€ 8
CJO	CLASHAGAD J														€ 8
CKT	CLONAKENNY														€ 8
CFB	CLOONFREE E														€ 8
GDS	GOLDENFIELD														€ 8
RCE	RATHCOR EXP														€ 8
SBD	SHINAGH BAN														€ 7
BHH	BARNHILL HAN														€ 8
BHO	BREEMOUNT I														€ 8
BHY	BARNHILL HAF														€ 8
FL17	BOLIDE														€ 7
CIO	CORBALLY IDC														€ 8
DGA	DERG ALAN	PG/NW	LM	0.69	20.1	1.08	-0.07	3.57	.	0.86	97	85	3.1	287	€ 8
DAD	DUHALLOW AIDEN	MUNSTER AI	LM	0.63	28.2	1.07	-0.24	3.58	129	0.68	121	97	4.0	285	€ 7
DWB	DUHALLOW BRENDAN	MUNSTER AI	LM	0.68	30.5	0.94	-0.19	2.59	129	0.68	104	80	4.3	285	€ 7
KHH	KNOCKNAGREE HAWTHORN	MUNSTER AI	LM	0.58	11.8	0.85	-0.06	3.10	106	0.88	108	101	3.5	285	€ 7
PYR	POULNASHERRY CRUSADER	MUNSTER AI	LM	0.60	32.6	1.16	0.03	3.64	119	0.90	108	95	0.6	286	€ 7
BKY	BALLAGAN KELLY	MUNSTER AI	ST	0.61	36.3	0.79	0.21	1.76	107	0.75	83	78	5.0	284	€ 7
DFI	DOLFI (ET)	DOVEA AI	ST	0.64	23.5	0.61	0.08	1.07	.	.	.	.	1.1	284	€ 10
DBO	DRUMNEIL BOLERO	PG/NW	ST	0.66	21.7	0.66	-0.05	1.60	.	0.62	75	109	3.4	283	€ 8
FBX	FREIGHDUFF BRENDAN	PG/NW	ST	0.50	29.5	0.83	0.11	1.53	126	0.91	125	86	4.0	284	€ 12

ICBF Active Beef Bull List 2004 –

- Proofs from;
 - Ø Central progeny test (commercial data)
 - Ø Tully central performance test (pedigree data)
 - Ø On-farm BLUP (pedigree data)
 - Ø AI Calving survey (commercial data)
- Systems not connected & not comparable.
- No €-value?
- Which bull is best?



Key Profit (€) Data.



<i><u>Data</u></i>	<i><u>Source</u></i>
• ID & Ancestry	Animal Events
• Calving Performance	Animal Events
• Weaning weight & calf value	Marts
• Linear scores	Linear scorers
• Carcass data	Factories
• Feed Intake	Tully
• Data collected on some 50 beef traits!	
• Need to simplify into which traits are most important.	

Data file after edits

Trait	Extraction date	
	<i>Jun-05</i>	<i>Nov-05</i>
height withers	48,876	53,256
width at withers	47,879	50,066
length back	47,881	52,246
pelvic length	47,881	50,063
width behind withers	47,879	52,246
loin development	48,872	53,255
dev hind quarter	48,905	53,285
Live weight	34,464	35,636
Carcass weight	133,022	138,255
carcass conf	132,802	138,035
carcass fat	132,786	137,998
cull cow	24,160	26,646
weaning weight	30,699	32,590
Feed Intake	1,512	1,778
Total data records	827,618	875,355
Extra		47,737

Predictor traits:

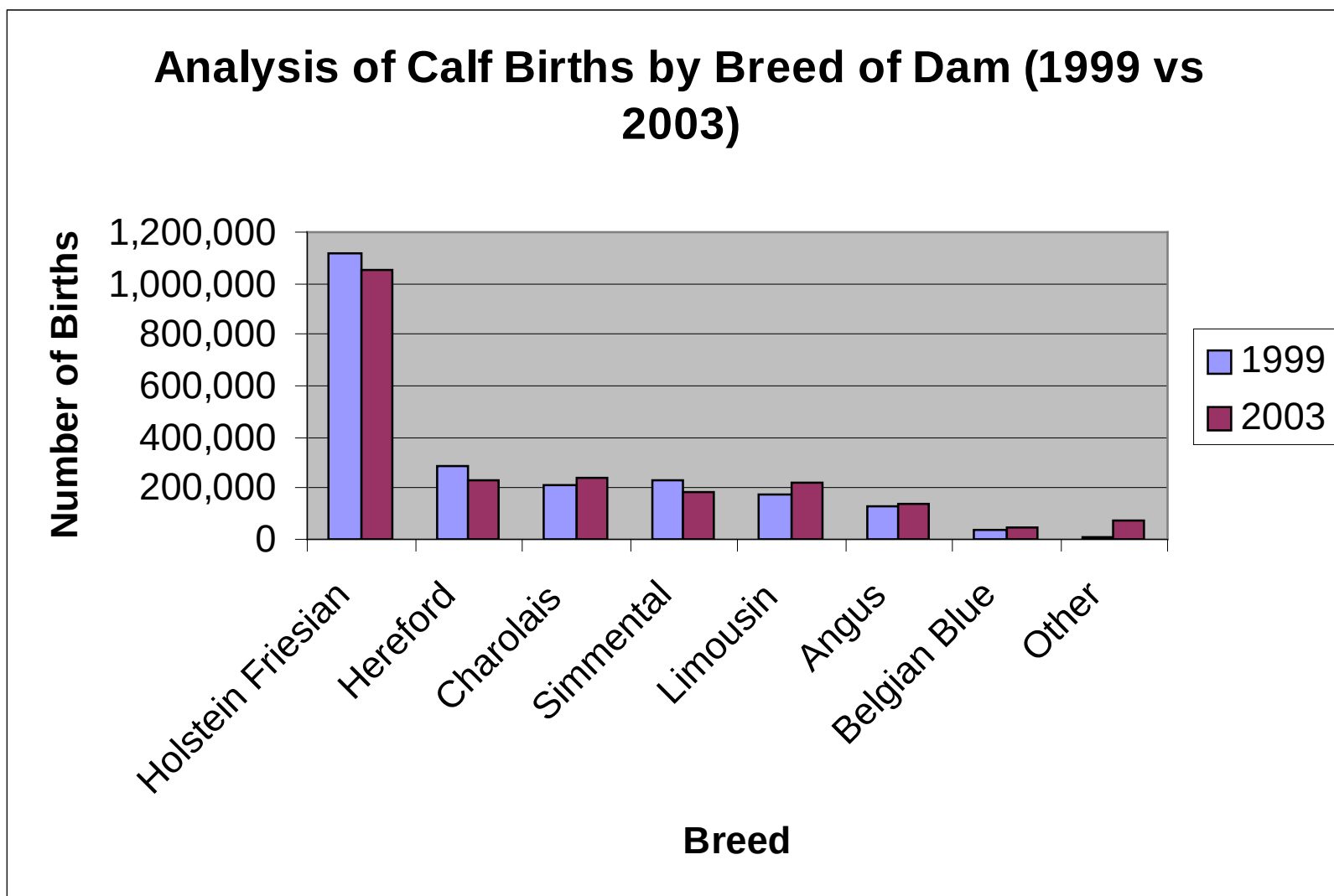
- ***Correlated to goal traits***
- ***Heritable***
- ***Measurable***
- ***Available early***

Goal traits:

- ***Economically important***
- ***Heritable***



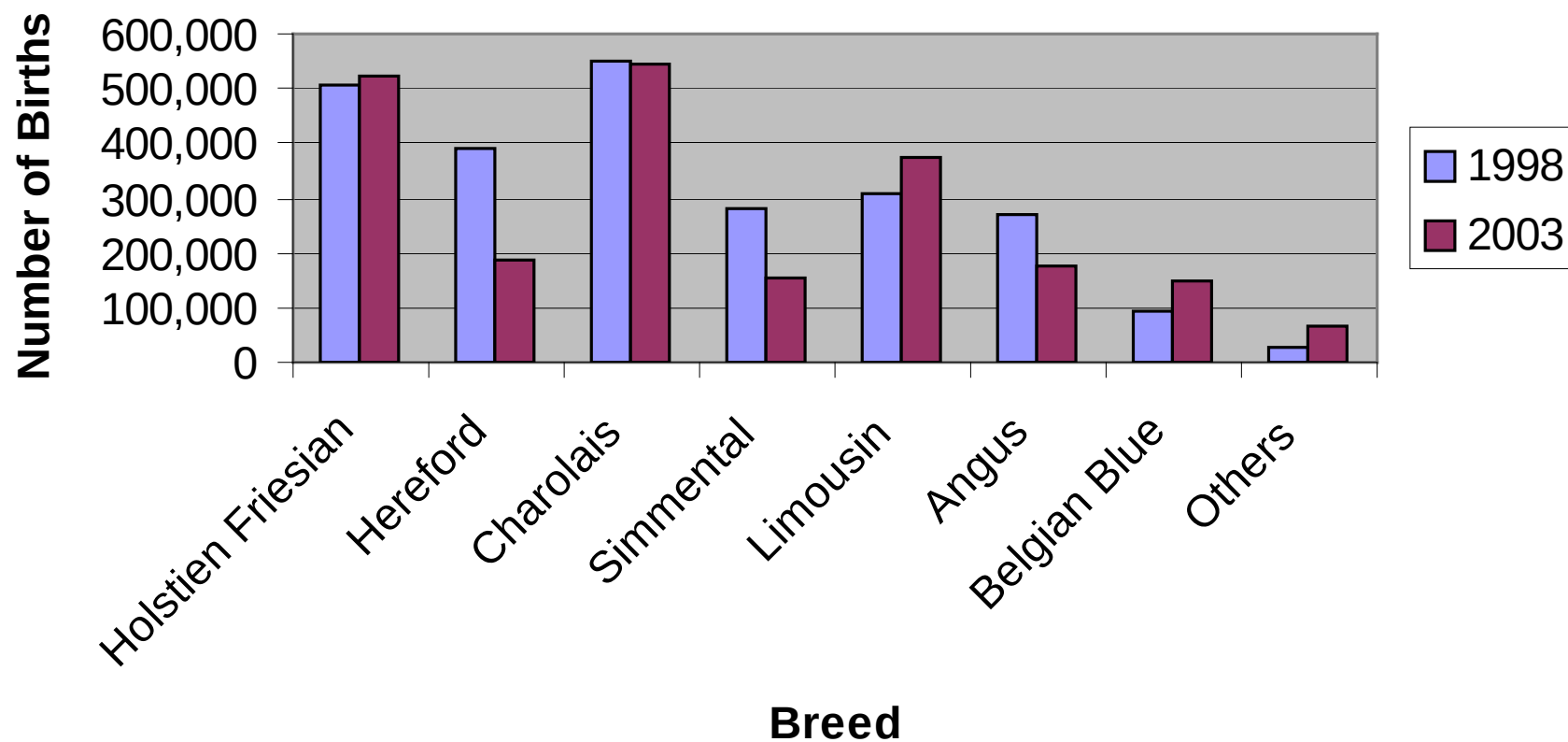
Trends - Breeds of Dams





Trends - Breed of Sires

Analysis of Calf Births by Breed of Sire (1998 vs. 2003)





Index & sub-index presentation

- Future - information on “Total Beef Merit” and 4 “beef sub-indices”.
 - Calving Performance (Difficulty, Gestation, Mortality)
 - Calf Quality (Weight, Conformation)
 - Production & Slaughter (Weight, Conf., Fat, Feed)
 - Maternal (Fertility, Survival, Milk, Feed)
 - Total Beef EBI (combination of above)
- Farmers will be able to rank all animals on basis of €/progeny – **increased profit for beef farmers.**



Total Beef Index



Index	Trait		%	Explanation
BPSI (€) Beef Production Sub - Index	Carcass Weight	(Kgs)	55%	This Sub-Index will estimate how good a bull is at producing progeny with high value carcasses. Bulls that are producing cattle that have a high carcass weight for age, good conformation at kill out and good lifetime feed efficiency will score highly.
	Weaning Weight	(Kgs)	20%	
	Carcass Conformation	(Grade)	12%	
	Dry Matter Intake	(Kgs)	8%	
	Carcass Fat	(Grade)	5%	
WCSI (€) Weaned Calf Sub - Index				This Sub-Index will estimate how good a bull is at producing high value weanlings for sale. Suckler farmers who are selling their weanlings should look more closely at bulls in this Sub Index.
	Weaning Weight	(Kgs)	31%	
	Calf Quality	(€)	69%	
BCSI (€) Beef Calving Sub - Index				This Sub-Index puts a direct cost on calving problems estimated for each bull when used in a Suckler Herd. It puts a direct cost on calving problems estimated for each bull. It takes into account calving difficulty, gestation length and mortality.
	Calving Difficulty	(%)	46%	
	Gestation Length	(Days)	28%	
	Calf Mortality	(%)	27%	
DCSI (€) Dairy Calving Sub - Index				This Sub-Index puts a direct cost on calving problems estimated for each bull when used in a Dairy Herd. It is very similar to the beef calving index, except that the economic impact of using a “difficult” calving bull on the dairy herd is much higher – d
	Calving Difficulty	(%)	35%	
	Gestation Length	(Days)	55%	
	Calf Mortality	(%)	10%	
MSI (€) Maternal Sub - Index	Cow Survival	(%)	14%	This Sub-Index is to be used where a suckler farmer is choosing a bull to breed replacements from.
	Calving Interval	(Days)	20%	
	Age at First Calving	(Days)	11%	
	Maternal Calving Difficulty	(%)	14%	
	Maternal Weaning Weight	(Kgs)	39%	
	Cull Cow Carcass Weight	(Kgs)	2%	



What will the indexes look like?



Brd	Code	Name	Total	BCSI	BPSI	WCSI	MSI
AA	MTL	MINIT OF LISS		€3	€45	€54	
BB	IVH	VAN HET NEGENBONDER IMRE		-€22	€117	€188	
CH	NWK	ENFIELD NEWLOOK		-€27	€160	€144	
HE	GDS	GOLDENFIELD 1 SUPERSTAR (P)		-€9	€53	€34	
LM	ORO	ORTOLAN		-€21	€87	€122	
SI	HKG	HILLCREST KING		-€24	€117	€95	

- Differences of €100 within & across breeds (€0.30/kg) already identified.
- All breeds compared on same scale.
- Beef, weaning & calving complete.
- **No maternal and total indexes yet.**
- **But start using new indexes for terminal sire breeding.**



Do the indexes work?



- Indexes accurately rank animals
- Large differences within breeds
- CH more profitable than AA for “beef slaughter”

		Raw		PTA	
CH	BPSI	Cwt	Conf	Cwt	Conf
Top20%	€139	377.7	9.2	39.4	2.3
40-60%	€93	337.7	7.6	26.8	1.9
Btm20%	€44	319.0	7.0	12	1.4
Ave	€93	347.4	8.1	26.3	1.8

		Raw		PTA	
Angus	BPSI	Cwt	Conf	Cwt	Conf
Top20%	€37	323.8	6.5	11.5	1.3
40-60%	€11	292.1	5.8	2.7	1.1
Btm20%	-€25	286.8	6.1	-8.6	1.2
Ave	€8	301.7	6.2	2	1.2



Do the indexes work?



- Indexes accurately rank animals
- Large differences within breeds
- AA more profitable than CH for “beef calving”

		Raw Data		PTA's	
Angus	BCSI	GL	Cdiff	P_CD	P_GL
Top20%	€6	281.8	5.0%	-3.4	0.6
40-60%	€1	282.2	3.0%	-2.1	0.9
Btm20%	-€6	283.8	10.0%	-0.1	1.5
Ave	€0	282.8	6.0%	-1.8	1

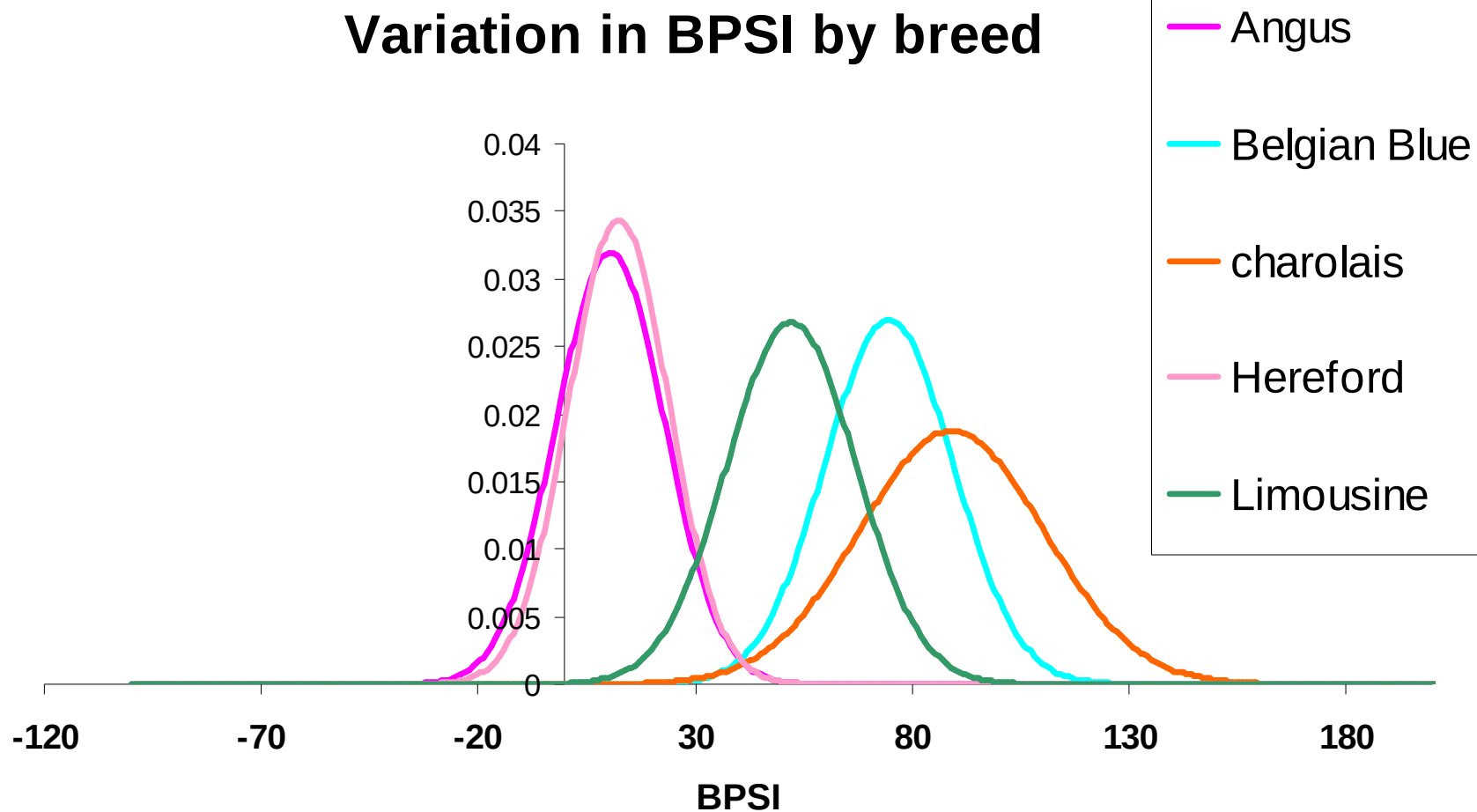
		Raw Data		PTA's	
CH	BCSI	GL	Cdiff	P_CD	P_GL
Top20%	-€17	285.6	7.0%	2.5	2.7
40-60%	-€22	287.5	5.0%	4.4	3.2
Btm20%	-€29	287.9	18.0%	6.8	3.7
Ave	-€22	286.9	10.0%	4.5	3.2



Beef Production Sub Index

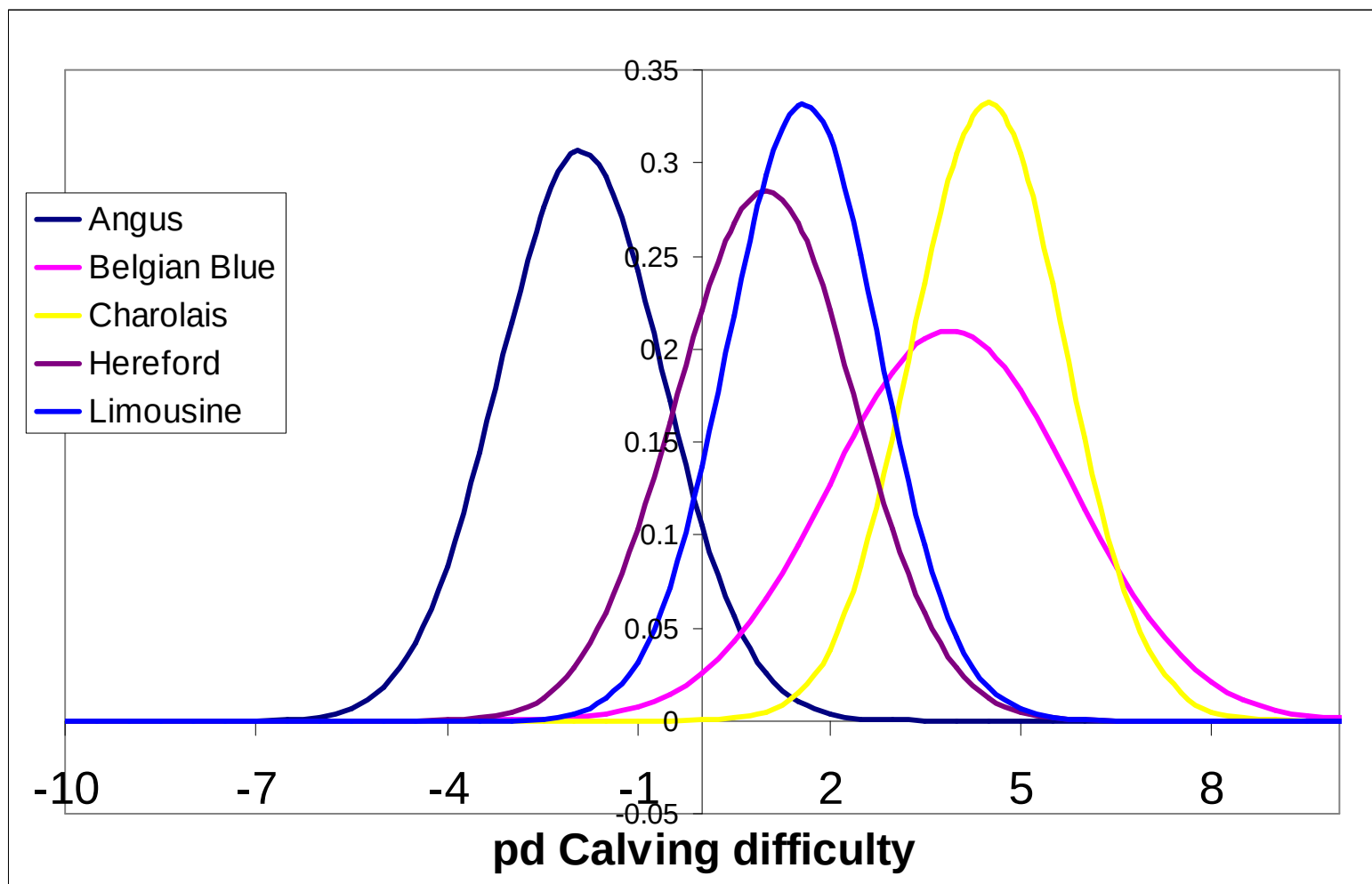


Variation in BPSI by breed





Calving Difficulty





Using the new indexes



Bull	DCSI	BSCI	Rel- DCSI	BPSI	WSCI	Rel-WCSI	Rel-BPSI
FIN	3.80	2.93	58	53.29	64.98	37	53
BFF	14.47	13.12	96	-14.10	15.23	54	92
Difference	-10.67	-10.19		67.39	49.75		

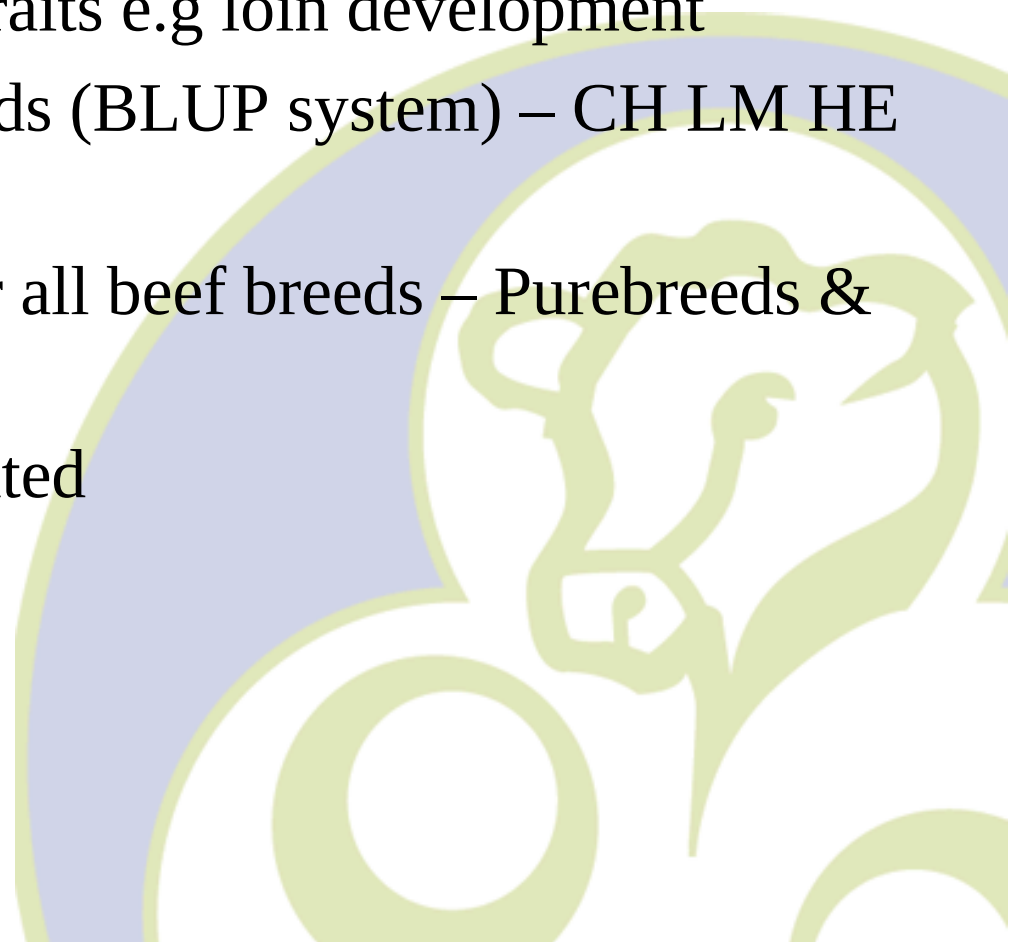
- BFF will leave offspring that cost ~€10 less in terms of calving difficulty
- FIN will leave offspring that are worth ~€67 more at slaughtered
- FIN will leave offspring that are worth ~€50 more at weaning



New Beef Linear Evaluations

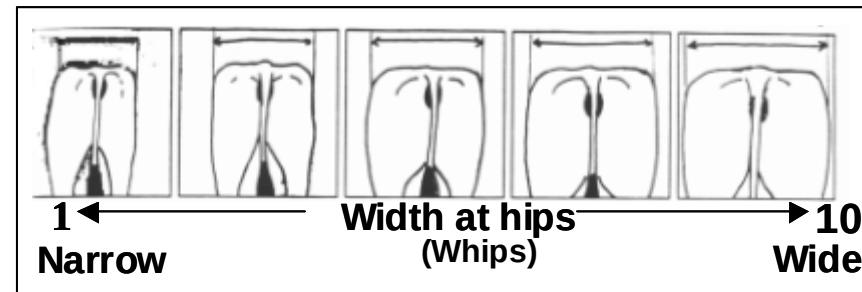
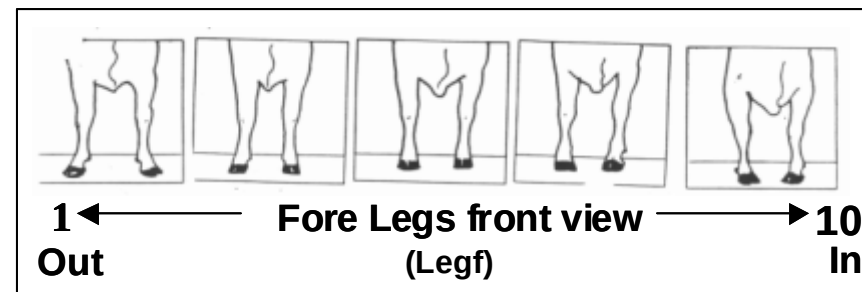
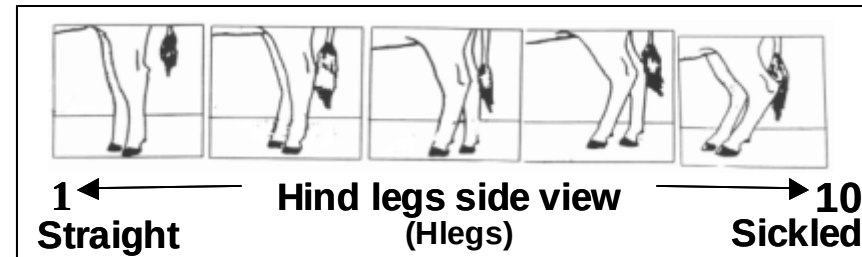
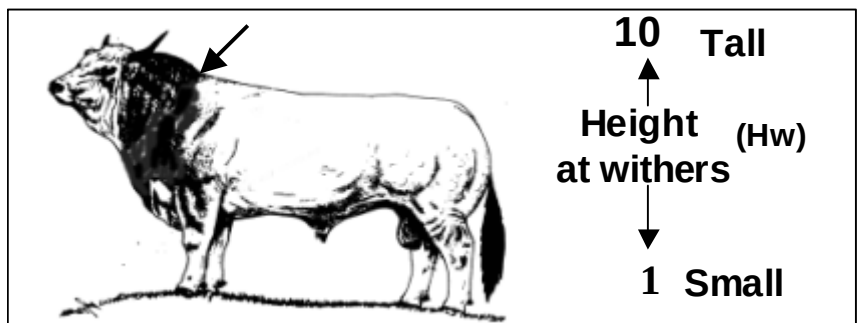
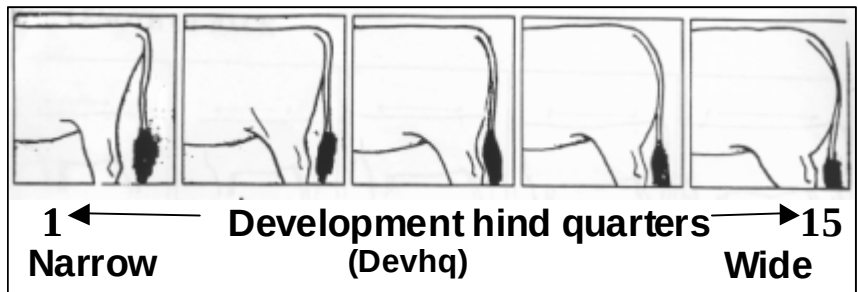
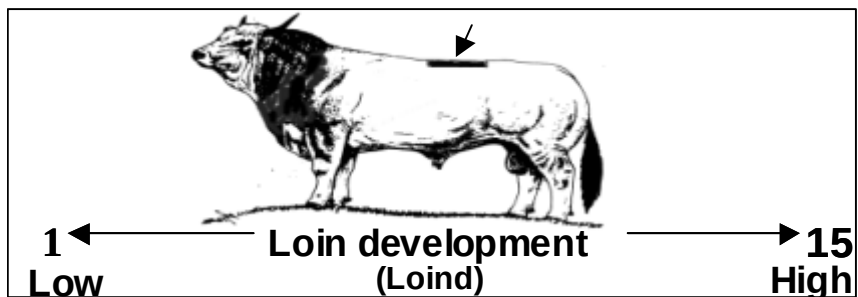
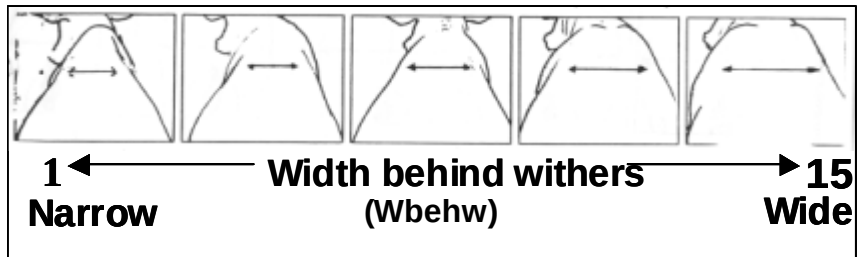


- Can be used for direct selection e.g. docility, locomotion
- Can be used as predictor traits e.g loin development
- Previously only for 4 breeds (BLUP system) – CH LM HE SM
- Linear scores available for all beef breeds – Purebreeds & Crossbreeds
- 14 linear type traits evaluated



Beef Linear Scoring Guide

Linear scoring describes an animal by assigning scores to traits.



Locomotion (Loc) - Level of correctness when animal walks
1 <-----> 10
Poor Good

Docility (Doc) - Degree of tameness of animal at inspection
1 <-----> 10
Not Docile Docile



Beef Linear Scoring Guide



Trait	Min	Max
	1	15
Width at withers (watw)	Narrow	Wide
Width behind withers (wbehw)	Narrow	Wide
Loin development (loind)	Low	High
Develop of hind quarters (devhq)	Narrow	Wide
Thigh width (thw)	Narrow	Wide
	1	10
Fore legs front view (legf)	Out	In
Height at withers (hw)	Small	Tall
Length of back (lenb)	Short	Long
Length of pelvis (lenp)	Short	Long
Hind legs side view (hlegs)	Straight	Sickled
Width at hips (whips)	Narrow	Wide
Hind legs rear view (hlegr)	Hocks in	Hocks out
Docility (doc)	Not Docile	Docile
Locomotion (loc)	Poor	Good



PTA - Angus



	Min	Max
watw	-0.515	0.75
wbehw	-0.520	0.275
loind	-0.571	0.513
devhq	-0.632	0.209
thw	-0.398	0.341
legf	-0.105	0.09
hw	-0.415	0.305
lenb	-0.305	0.235
lenp	-0.346	0.297
hlegs	-0.111	0.147
whips	-0.479	0.369
hlegr	-0.066	0.101
doc	-0.455	0.245
loc	-0.075	0.065

*Predicted Transmitting Ability (PTA) is expressed on the same scale as the linear scores.

Beef EBI Animal Report – What does all the data mean?

BPSI - Beef Production Sub Index

Her progeny, **if slaughtered**, would on average return an extra profit of **€117**

WCSI - Weaned Calf Sub Index

Her progeny, **if sold as weanlings**, will on average return an extra profit of **€115**

MSI - Maternal Sub Index

Not yet available

EBI - Economic Breeding Index

The total profit (€), that her progeny will return, on average. Will be available when Maternal Index is published.

BCSI - Beef Calving Sub Index

The **calving costs** associated with her progeny, in a Suckler herd, will be on average **€21**

DCSI - Dairy Calving Sub Index

The **calving costs** associated with her progeny, in a Dairy herd, will be on average **€35**

Sire AI Code/Tag number
Date of Birth
Tag number

Pedigree Information			Economic Indexes						PTA's Calving			PTA's Beef				PTA's Maternal			
Animal ID	DOB	Sire ID	EBI	BPSI	WCSI	BCSI	DCSI	MSI	C Diff	Mort	GL	Cwt	Wwt	C Conf	DFI	Wwt	CI	Surv	Doc
Name	Sex	Sire Name	Rel	Rel	Rel	Rel	Rel	Rel	%	%	days	kg	kg	grade	kg	kg	days	%	
Breed	Dam Name / ID	Mat GSire ID																	
IE123456780125	02/12/04	HHX		€ 117	€ 115	-€ 20	-€ 35		4.4	1.5	2.3	33.8	20.2	2.2	0				
H VERONA	F	H HARRY				25%	26%												
CH (100%)	H HILDA	JPR																	

Animal Pedigree Name
e.g. H Verona = Highfield Verona

Sex
Breed

Sire Name

Maternal Grand Sire ID

Dam Name / ID

C Diff – Calving Difficulty (%)
The Calving Difficulty of her progeny, will be on average, **4.4 % higher**, than the Reference Base

DOC – Docility
High Docility values indicate a quiet bloodline. Low Docility figures indicate a less docile bloodline.

Reference Base
The '**Reference Base**' consists of 102 Holstein Friesian Sires born between 1988 & 1992

Mort – Mortality (%)
Her Progeny will, on average, have a mortality percentage that is, **1.5% higher**, than the Reference Base (5.6%)

DFI – Daily Feed Intake (Kg)
The Daily Feed Intake of her progeny will on average, **be equal to**, the Reference Base (10Kg DMI/Day)

Reliability
The '**Reliability**' value is an indication of the amount of available information. An animal with a record of performance on itself may have a reliability of 40%. A Sire with 200 progeny could have reliability over 90%.
The reliability % of an animals index should always be taken into account when making a breeding decision.

GL – Gestation Length (days)
The Gestation Length of her progeny, will be on average, **2.3 days longer**, than the Reference Base (282 Days)

C Conf – Carcass Conformation (grade)
The Carcass Conformation of her progeny will be on average, **2.2 Grade units higher**, than the Reference Base (4.36)

C Wt – Carcass Weight (Kg)
The Carcass weights of her progeny, will be on average, **33.8 Kgs heavier**, than the Reference Base (314Kg)

W Wt – Weaning Weight (Kg)
The Weaning weights of her progeny, will be on average, **20.2 Kgs heavier**, than the Reference Base (248Kg)



New beef Indexes – Roll-out plan



- New beef EBI reports posted in coming weeks
- ICBF Active Beef Bull List
- Period of “major change” in indexes
- Huge opportunities for breeders & industry (€)
- **Working together, higher profit can be achieved.**