



Implementation of changes in EBI

Date: 16th November 2022

Margaret Kelleher

EBI updates event

Corrin mart



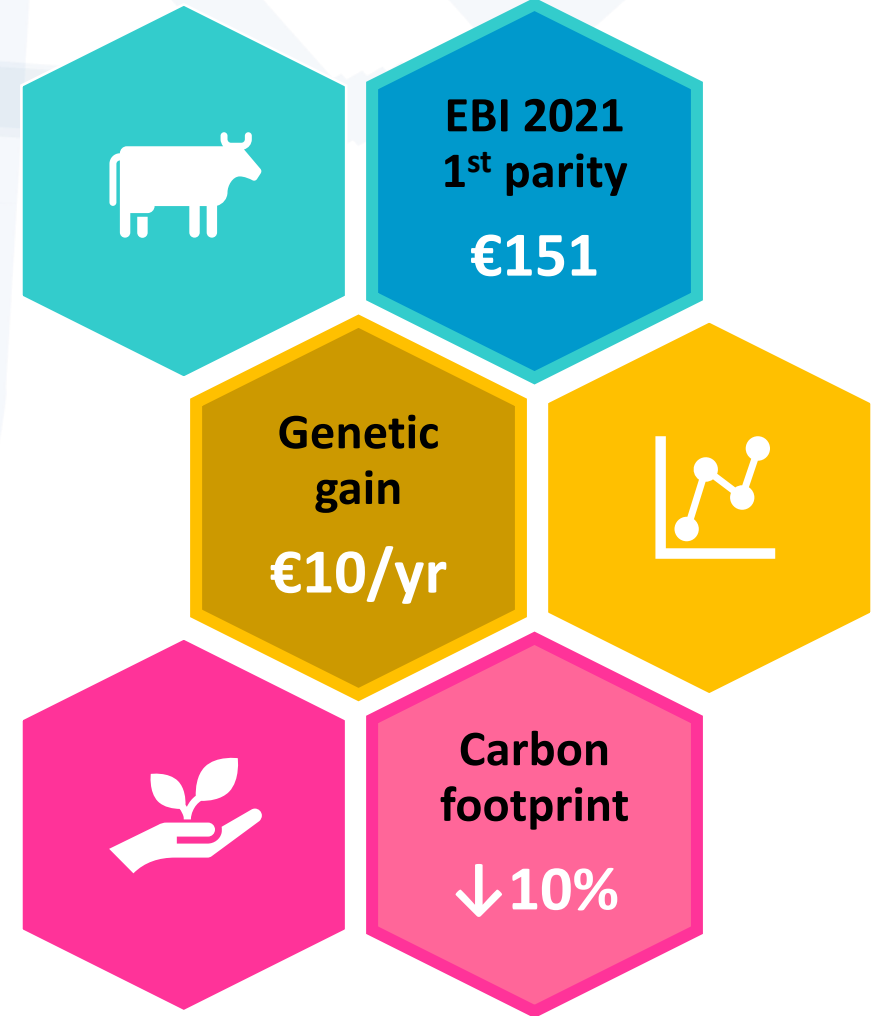
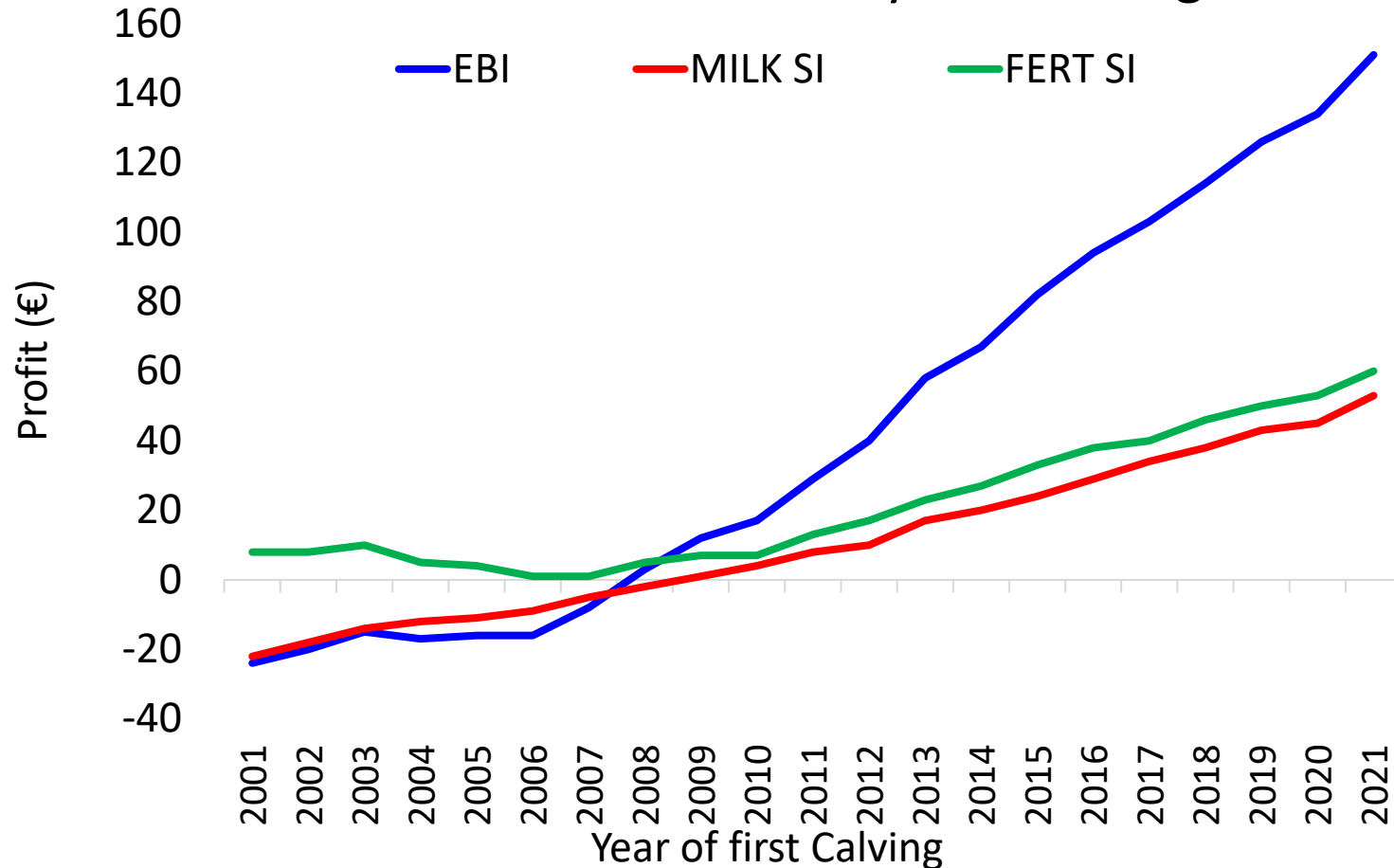
An Roinn Talmhaíochta,
Bia agus Mara
Department of Agriculture,
Food and the Marine



AgTech - it's in our DNA

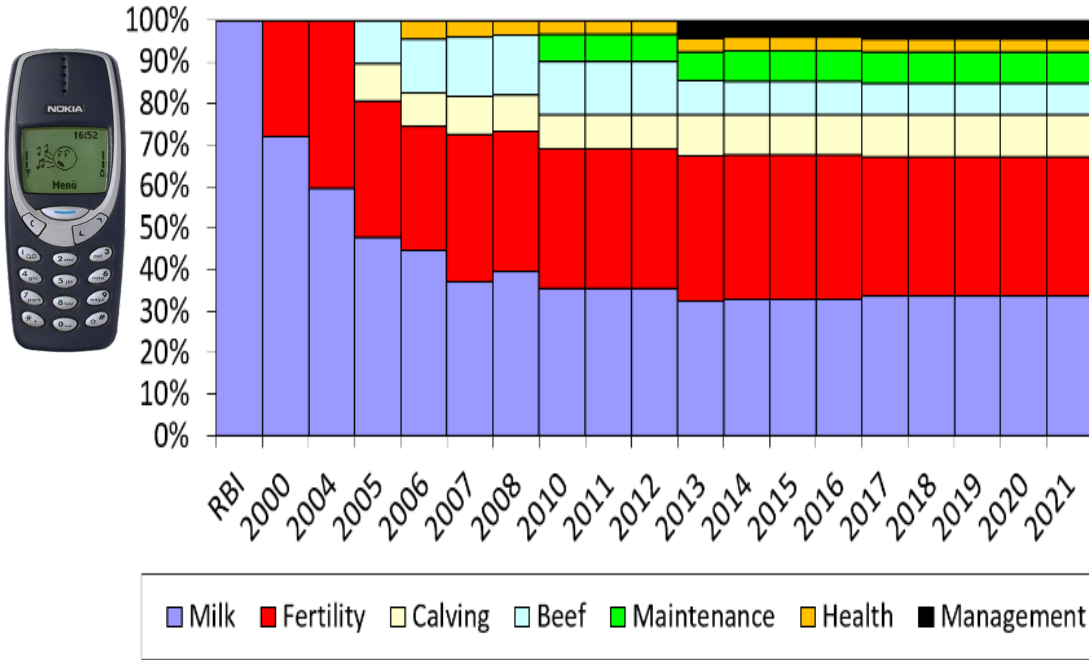
EBI: Where we are?

Genetic Trends in EBI by first calving



EBI is selecting for a more profitable and environmentally efficient cow for Irish farmers!

EBI: Why change?



- New data, methods and technology
- Market price changes
- Policy changes

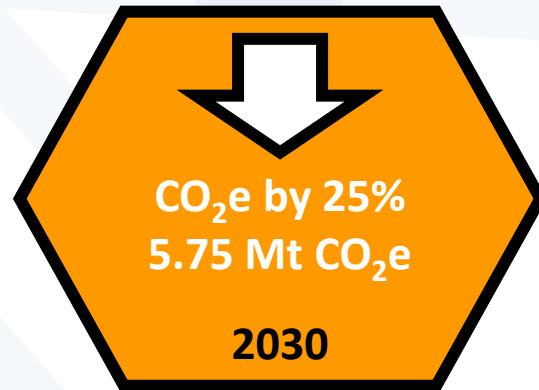
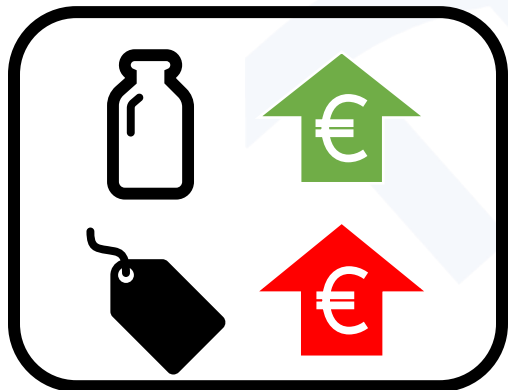
Table: Trends in direction in National breeding programme

Index (€)	Dairy females 2022*	Top 20 bulls on EBI	Top 20 Used Sires 2022**
EBI	188	361	304
Milk sub-index	68	103	103
Fertility sub-index	78	187	144
Calving sub-index	35	53	51
Beef sub-index	-13	-13	-13
Health sub-index	6	13	7
Maintenance sub-index	13	15	9
Management sub-index	2	3	4

*Based on 346k dairy females born in 2022 YTD

**Based on 20 most heavily used sires in 2022 YTD

Relative gain Y N



Categories of change



Addition of a new sub-index or trait

Last new sub-index
Management 2013

Last new traits

Milking temperament
& Milking time 2013



Upgrade of existing evaluation or trait

Last upgraded evaluation

Calving split 2020
Females in genomic
reference population 2020

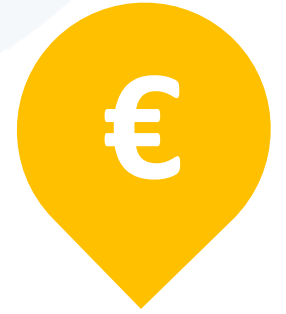
Last upgraded trait

Liveweight replaces cull
cow weight 2018



Base change

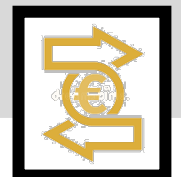
Last base change
Milk & Fertility 2016



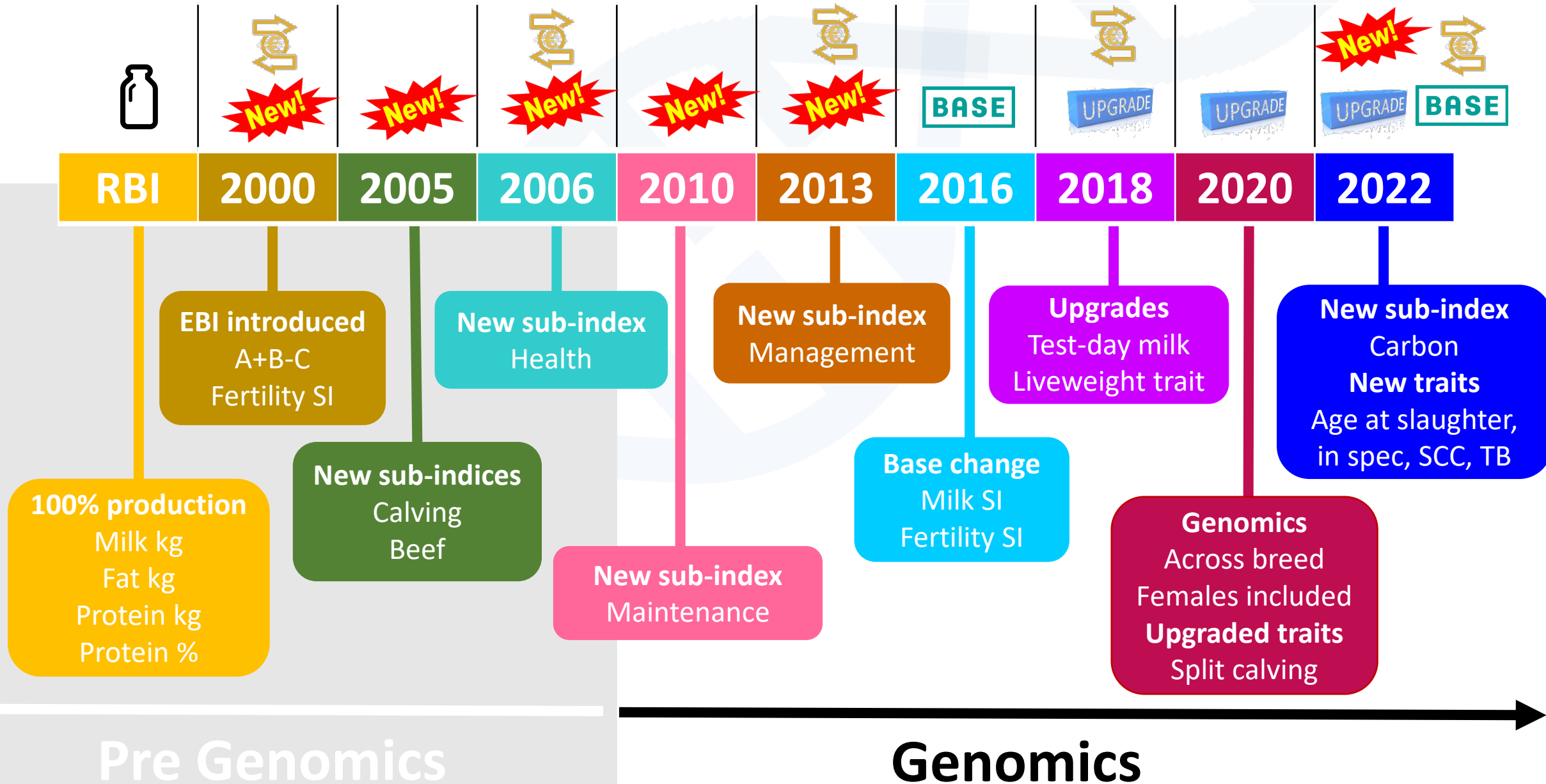
Update of Economic values

Last economic update

EBI: every 4-5 years
Beef SI: not since 2013

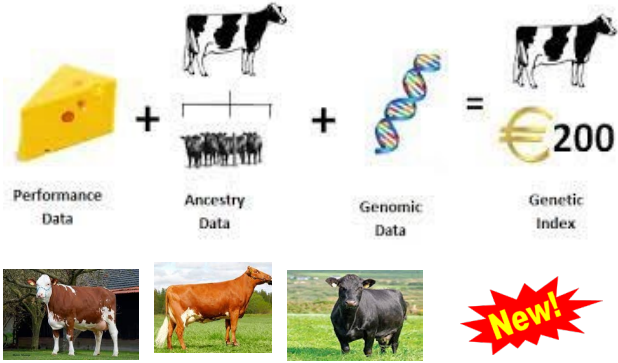


Timeline of changes in EBI

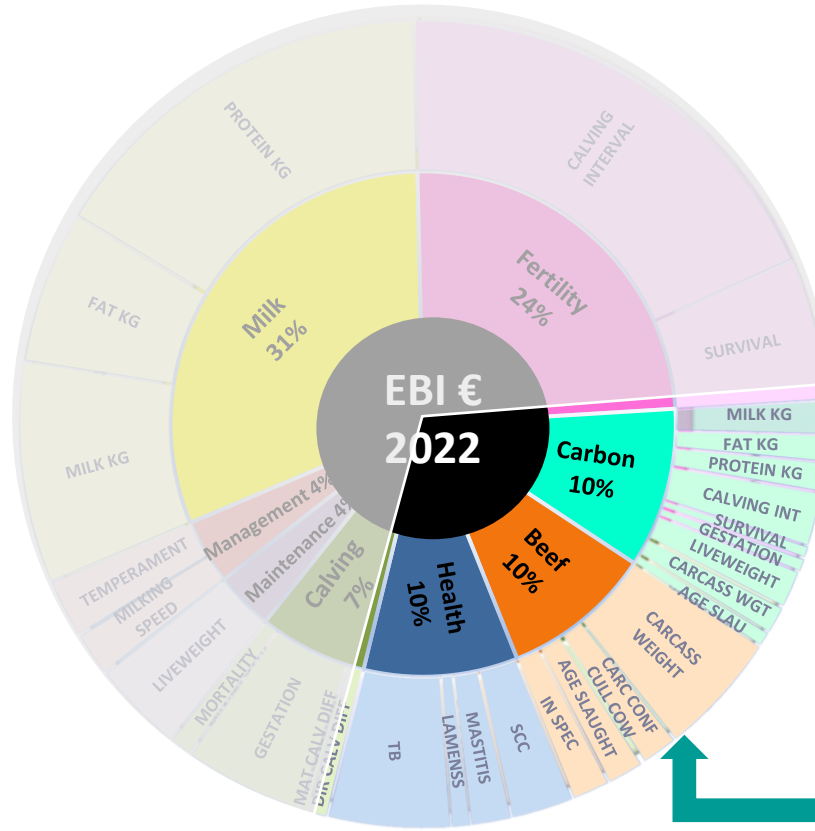
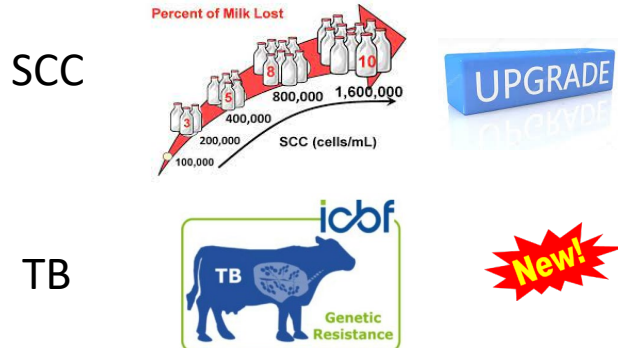


Pending EBI changes

Genomics for minor breeds



Health sub-index



Carbon sub-index



Beef sub-index

Age at slaughter



BASE

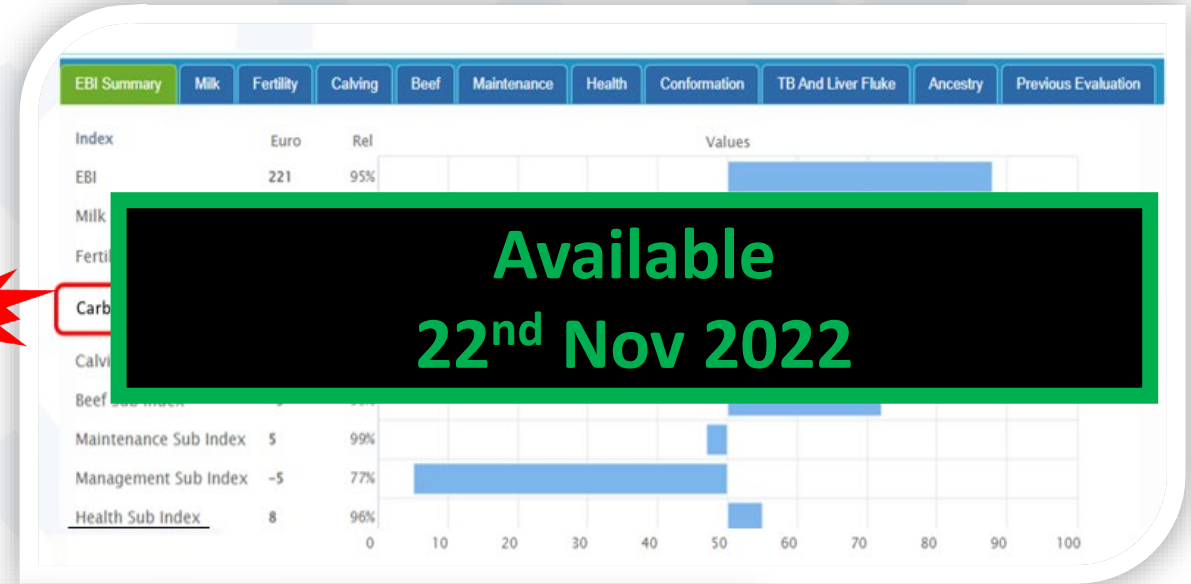
Carcass specifications

Progeny Carcass traits

Carbon Sub-Index

- New sub-index included in EBI
- Direct selection to reduce GHG emissions
- Faster gains to aid in meeting climate targets set
- Permanent and cumulative benefits with breeding

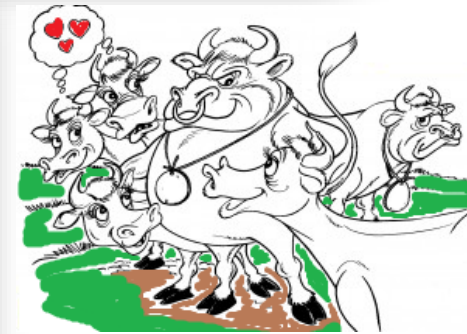
New!



How to use?

- ✓ HerdPlus scorecard on EBI reports/profiles will show you where your herd Carbon SI is currently at
- ✓ Look up bulls suitable for your herd

Scorecard (Oct 2022)	My Herd	National Average	Top 10%	Herd % Rank	Star Rating
Herd EBI	€173	€140	€177	89%	★★★★★
Milk Sub-Index	€52	€43	€59	80%	★★★★☆
Fertility Sub-Index	€78	€66	€82	85%	★★★★★
Carbon Sub-Index	€	€	€	%	☆☆☆☆☆
Calving Sub-Index	€35	€28	€36	87%	★★★★★
Beef Sub-Index	€-12	€-11	€-7	42%	★★★★☆
Maintenance Sub-Index	€12	€13	€20	33%	★★★★☆
Management Sub-Index	€1	€1	€3	30%	★★★★☆
Health Sub-Index	€6	€3	€6	90%	★★★★★



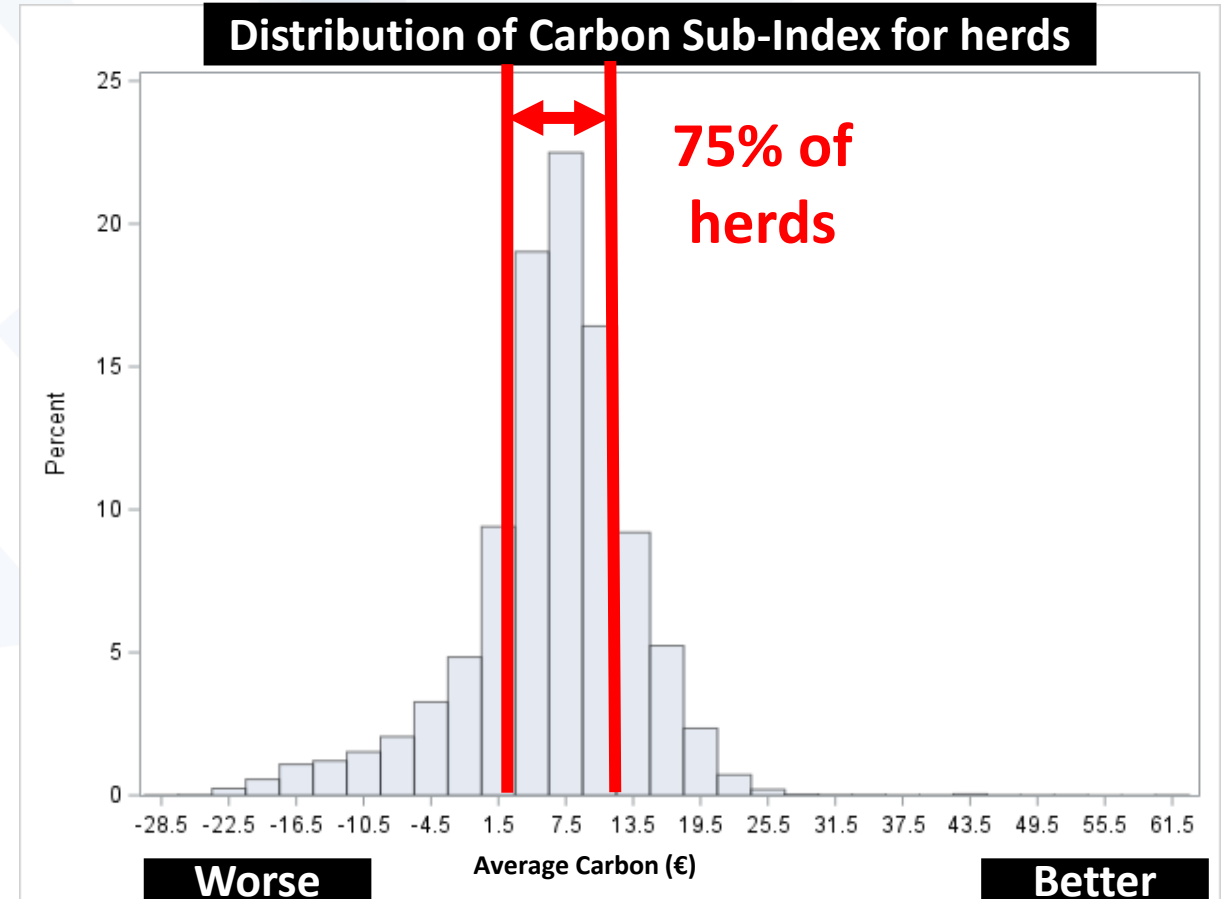
Carbon Sub-Index Values

Table: Summary statistics on Carbon sub-index values by different cohorts

Group	No.	Mean	SD	Min	Max
Top 100 bulls	100	€11	€9	-€7	€34
Active bulls	1,260	€1	€19	-€45	€56

- Average Carbon sub-index value for top 100 bulls is €11
- Average Carbon sub-index value for herds is €6

Improve Carbon sub-index by selecting team of bulls better than your own herd average for Carbon sub-index



Beef sub-index

Age at slaughter **New!**



BASE

Carcass specifications **New!**

Progeny Carcass traits

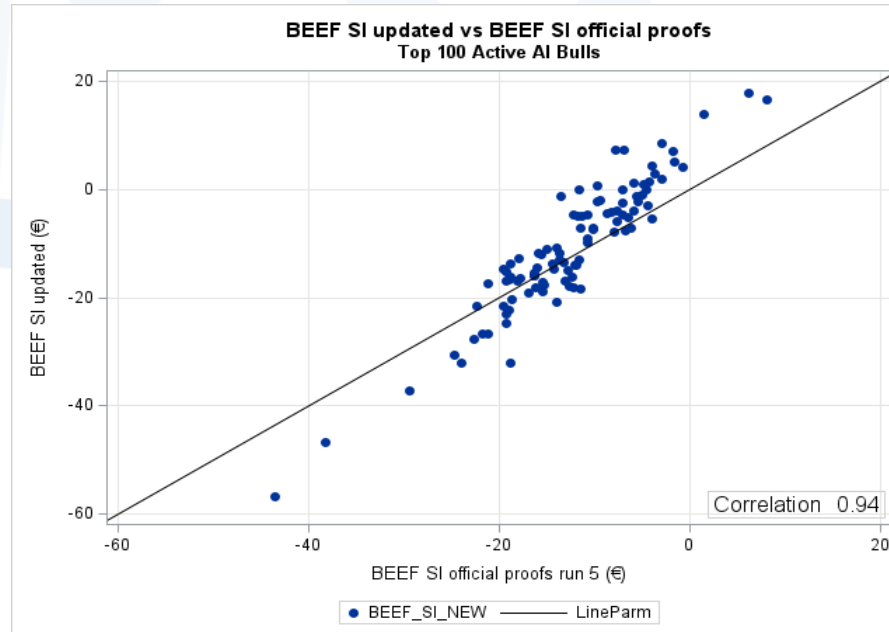
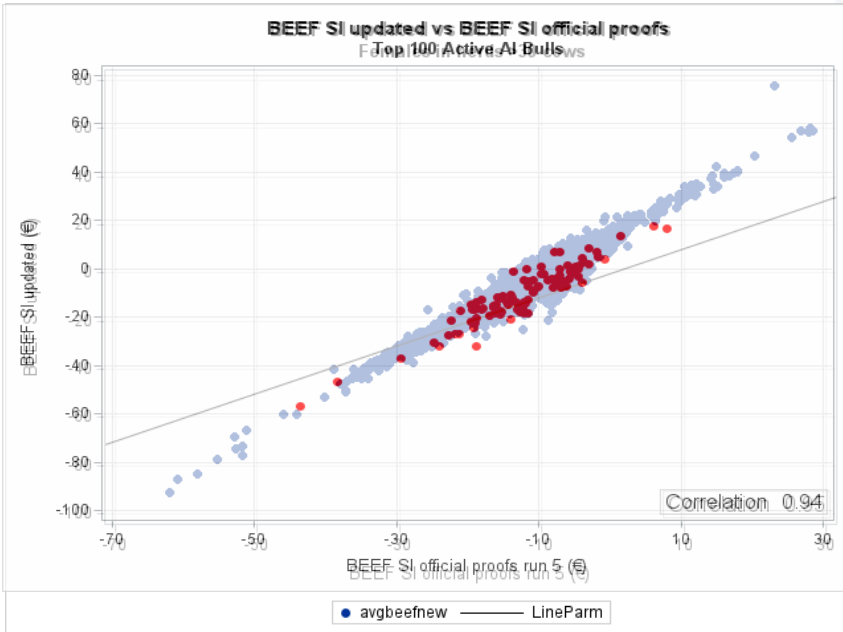


Beef Sub-Index

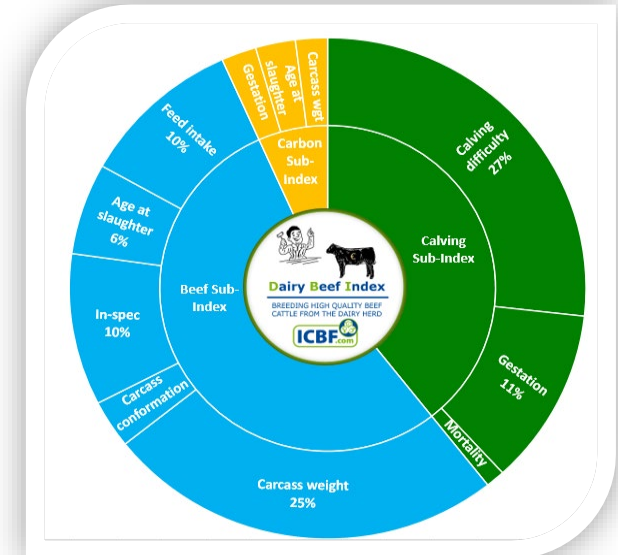
Table: Summary statistics on Beef sub-index current and new values

Group	Evaluation	No.	Mean	SD	Min	Max
Top 100 bulls	CURRENT	100	-12	2	-44	8
	NEW	100	-11	12	-57	18
Herd	CURRENT	10,871	-12	5	-62	28
	NEW	10,871	-4	9	-91	78

Overlay of top 100 bulls on herd population



Use DBI to pick beef bulls

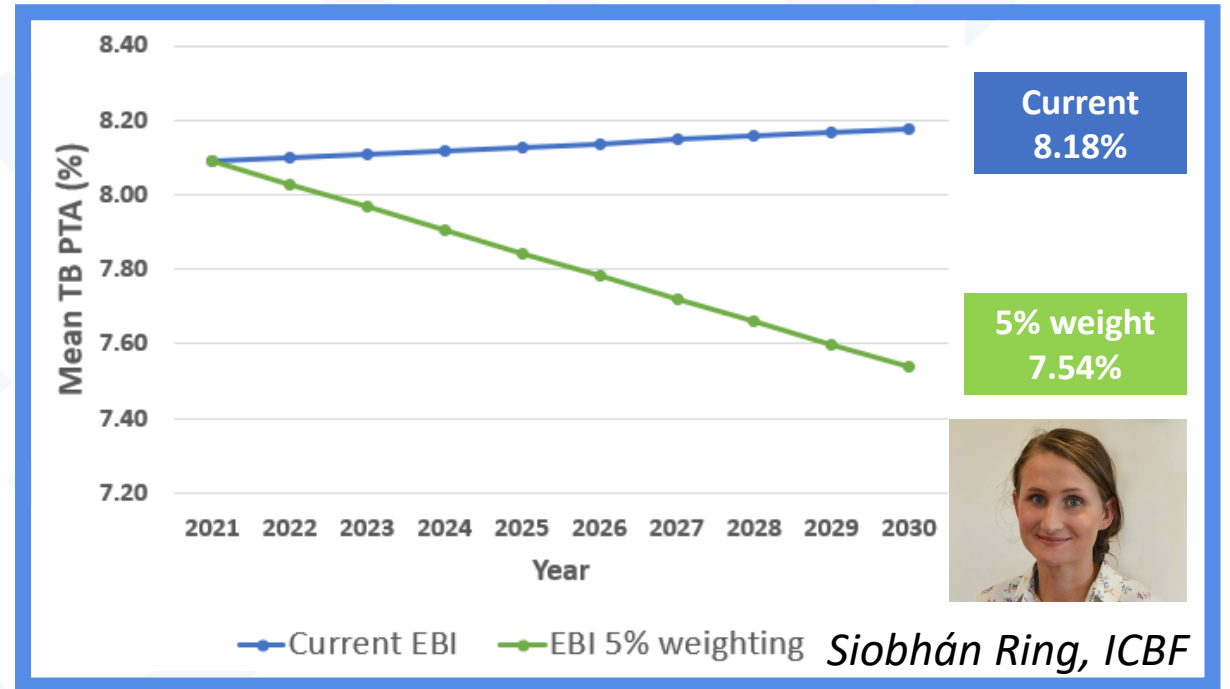


Health Sub-Index

Health sub-index

SCC

TB



Health Sub Index

Health Sub Index	PTA	Rel	Values	
Lameness (%)	-.02	98%		More
SCC	-.11	99%		More
Mastitis (%)	-.02	99%		More
TB (%)	6.25	99%		Less

UPGRADE

New!

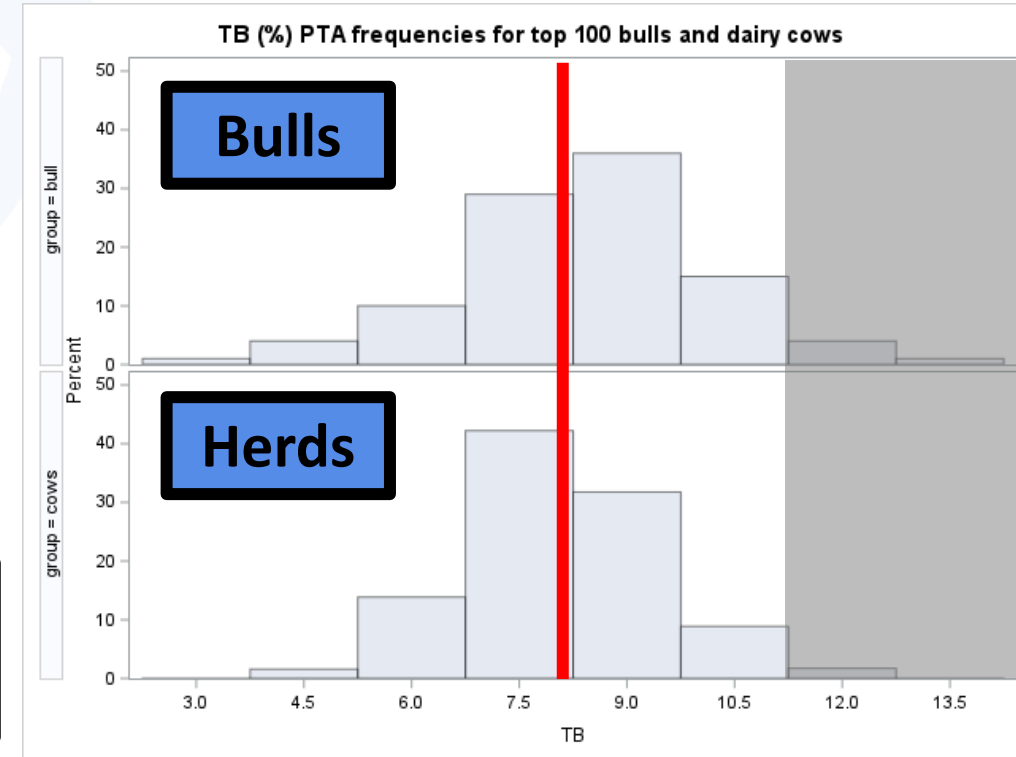
Health Sub-Index Values

Table: Summary statistics on Health sub-index, SCC and TB current and new values

	Group	Evaluation	No.	Mean	SD	Min	Max
Health SI (€)	Top 100 bulls	CURRENT	100	11	7	-9	27
		NEW	100	10	9	-8	41
	Herd	CURRENT	10,871	-4	9	-91	78
		NEW	10,871	-12	5	-62	28
SCC (PTA)	Top 100 bulls	CURRENT	100	-0.07	0.08	-0.26	0.13
		NEW	100	-0.08	0.06	-0.26	0.07
	Herd	CURRENT	10,871	-0.02	0.02	-0.23	0.07
		NEW	10,871	-0.08	0.03	-0.31	0.22
TB (PTA)	Top 100 bulls	CURRENT	100	8	2.0	3	13
	Herd	NEW	10,871	8	0.5	4	13

Desirable

- ↑ Health sub-index value
- ↓ SCC PTA value
- ↓ TB PTA value

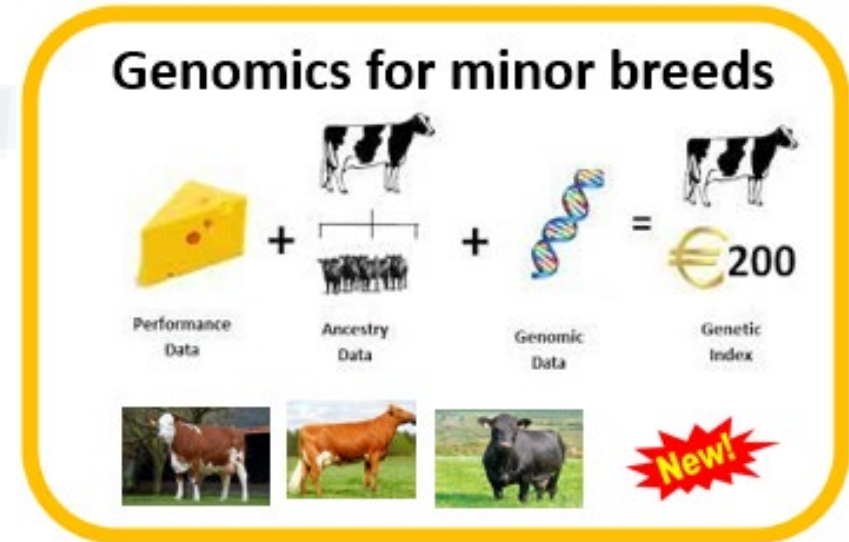


Updated SCC has ↑ variation: Beneficial for selection
Want ↓ TB values to reduce TB prevalence

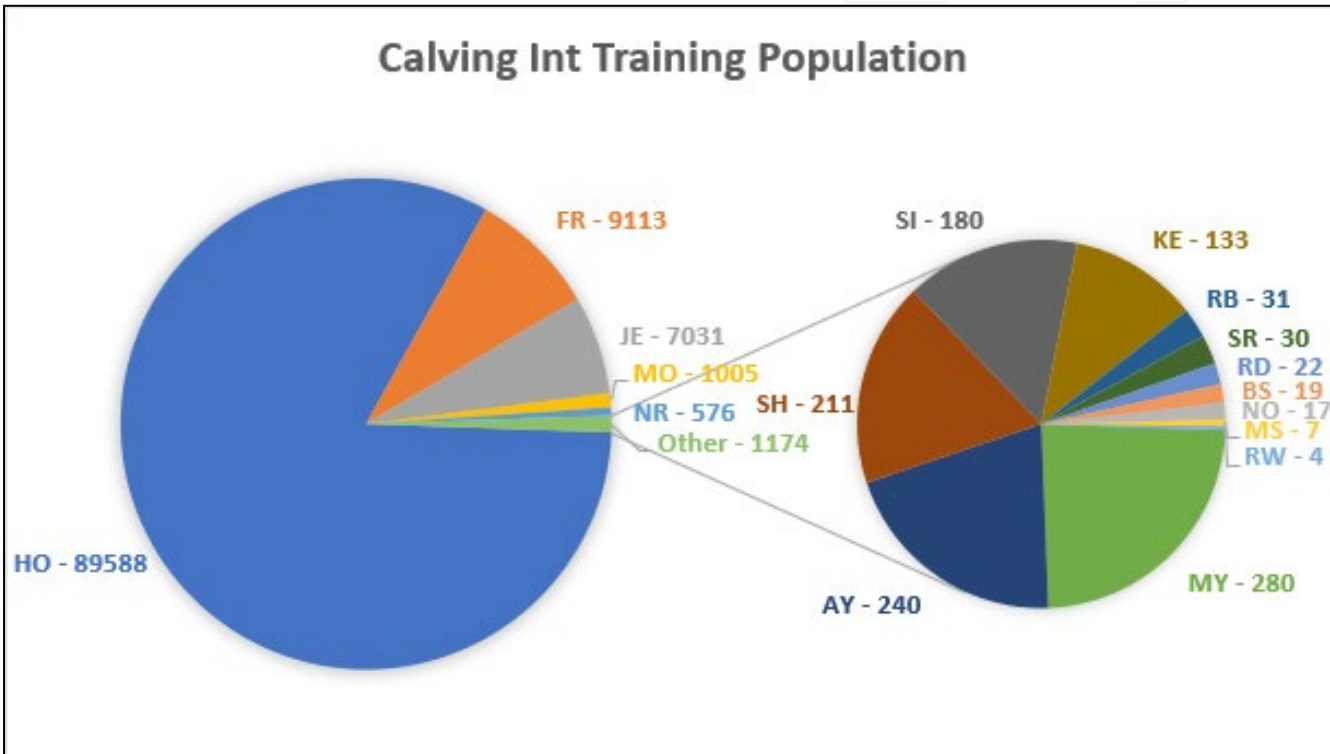
Genomics for minor breeds

- Across breed genomic evaluations introduced in 2020
- 10 new breeds being included in 2022

Brown Swiss	Fleckvieh	MRI	Shorthorn	Swedish Red
Normandy	Milking Shorthorn	Kerry	Red Danish	Rotbunt



Calving Int Training Population

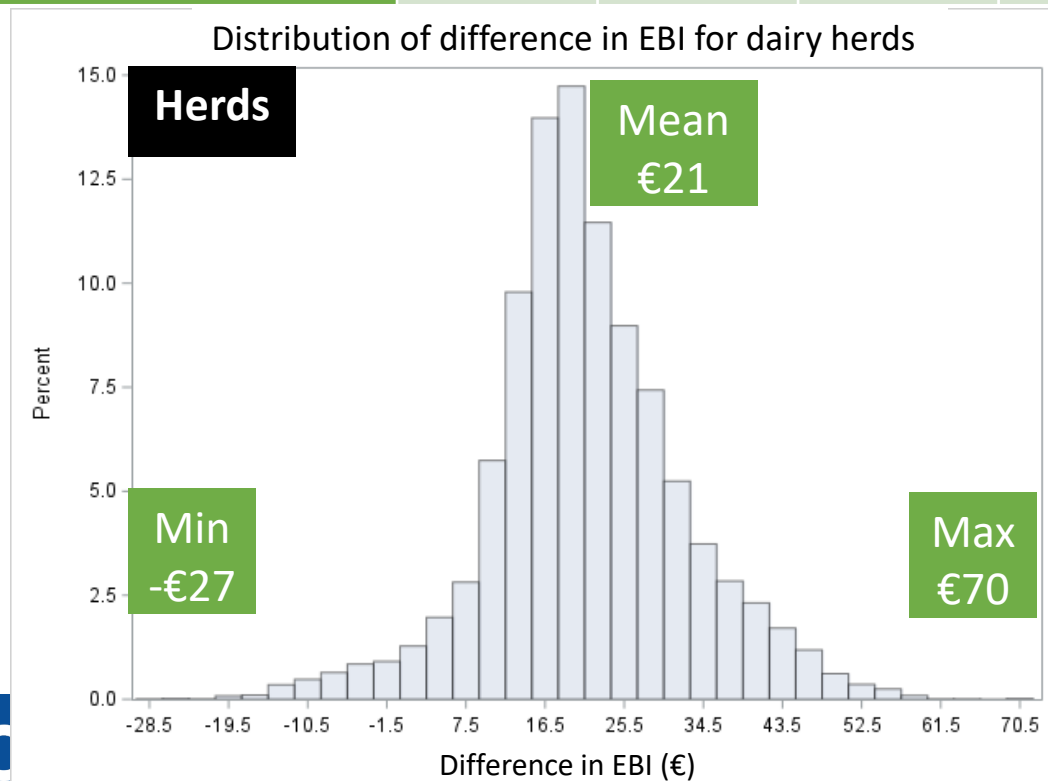
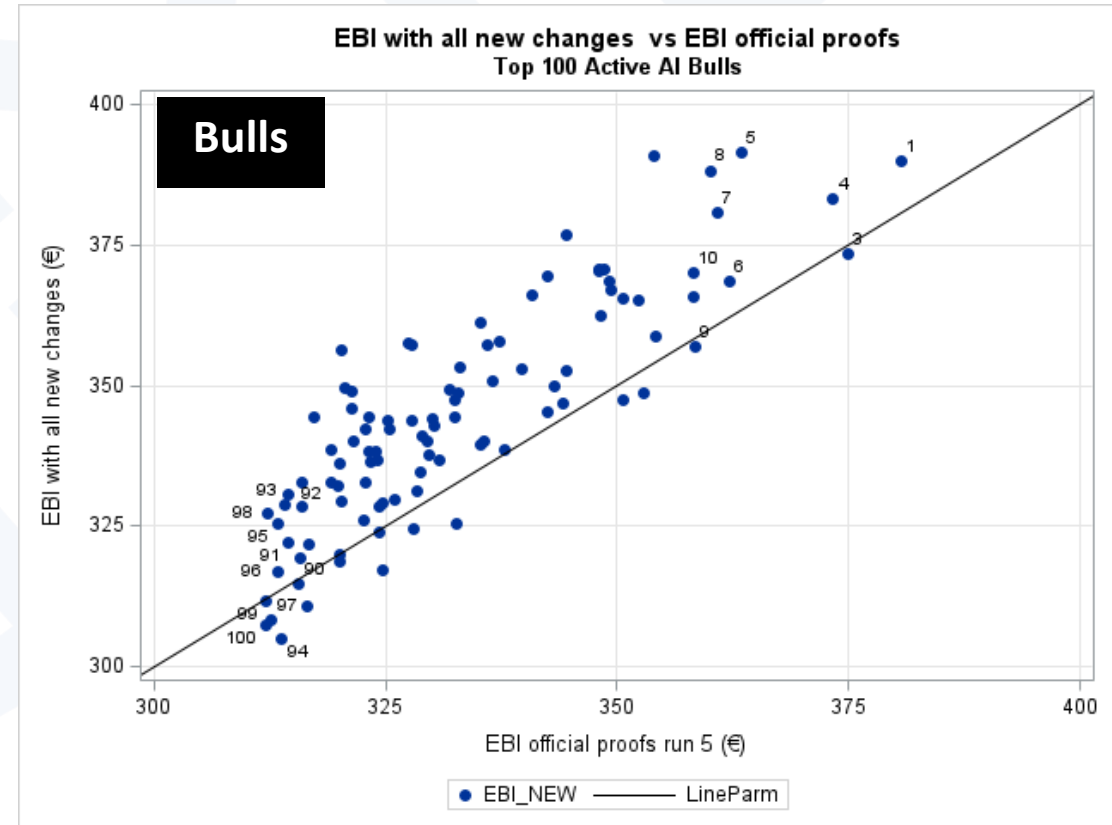


Impact

- More data available to do it
- Faster genetic gain
- Increased reliability of proofs
- Parentage verifications
- Increased traceability
- Select better replacements

Impact of all the changes overall

Index/Sub-index	Top 100 bulls		Herds (n=10,872)	
	Current	New	Current	New
EBI	333	345	136	157
Carbon sub-index		11		6
Beef sub-index	-12	-11	-12	-4
Health sub-index	11	10	4	10



Top 100:

- ☐ Mean change +€12
- ☐ 75% change range +€4 to +€19
- ☐ 92 out of 100 bulls stay in top 100 list

Are all the small cows getting higher EBI?

Maintenance Sub-index	Mature live-weight	Number herds	Percent	Mean change EBI	Mean Carbon (€)	Mean Beef SI (€)	Mean Health SI (€)
€10 or less	590kg or more	2126	20%	€11	-4	1	12
€10 to €15	560-590kg	5481	50%	€23	7	-1	10
€15 to €20	540-560kg	2173	20%	€26	11	-6	10
€20 plus	540kg or less	1091	10%	€22	16	-22	7.6

☐ Mean EBI change for all herds +€21

☐ Mean EBI changes for all herds split by maintenance sub-index:

- Maintenance greater than €10 have similar trends for EBI changes
- Maintenance less than €10 on average only increase by half compared to others

↑ Maintenance ↑ Carbon

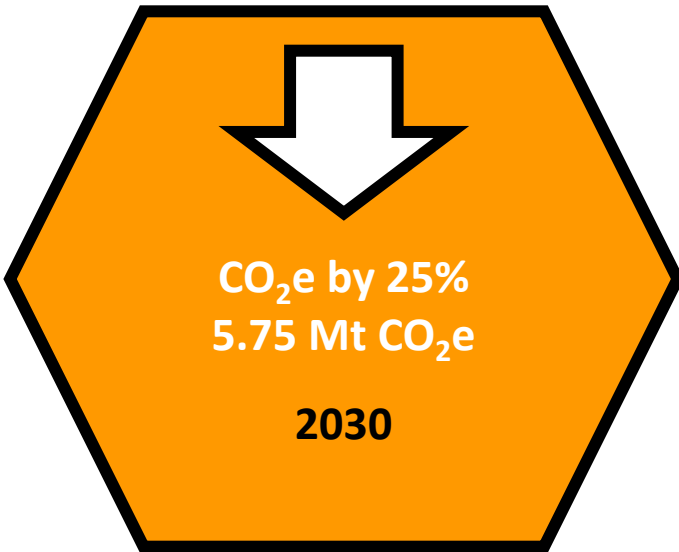
↑ Carbon ↓ Beef

↑ Maintenance ↓ Health

Similar change in EBI for all group except large cows

Lots of variance/scope in each group

Do we meet our Climate targets?

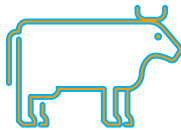


Breeding target = 1.2 MT or 21% of total target

- ❑ 0.8 Mt in dairy herds = 14% of total target
- ❑ 0.4 Mt in beef herds = 7% of total target

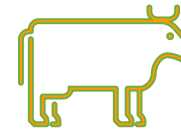
**EBI
current**

↓11.86 kg
CO₂e



**EBI
new**

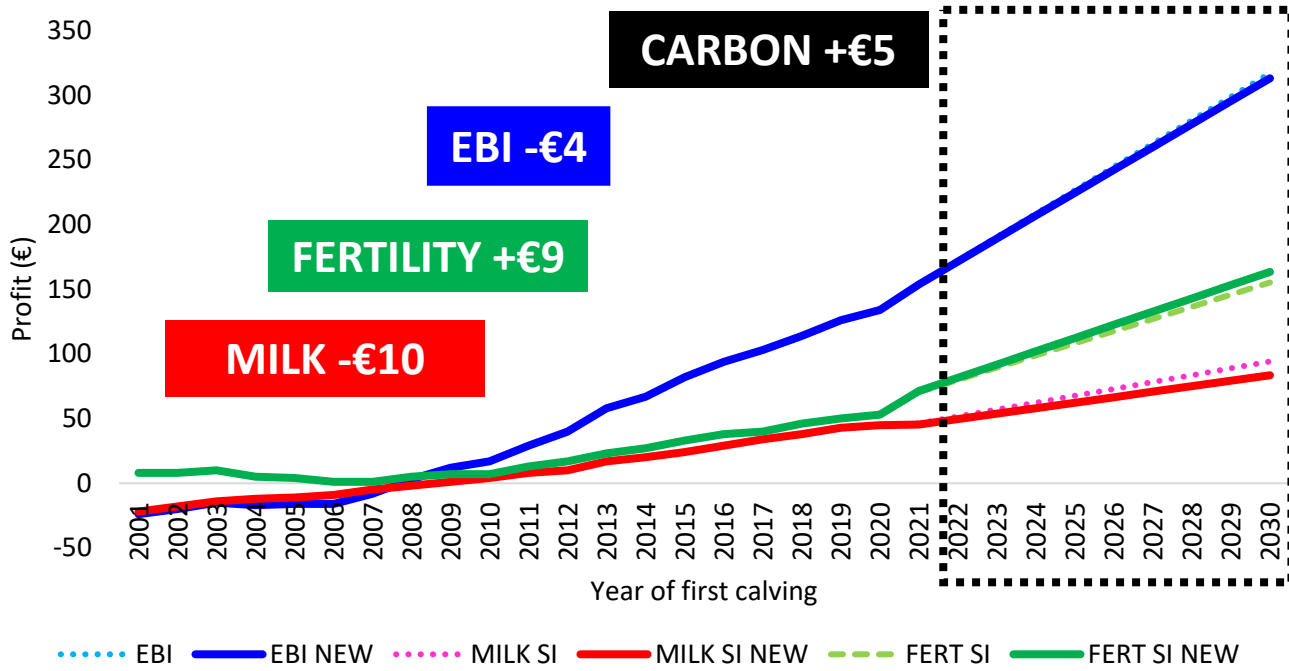
↓18.41 kg
CO₂e



- Breeding for EBI reduces GHG emissions
- New EBI 55% more efficient at reducing GHG emissions: **↓6.55 kg CO₂e**
- At 1.6 million dairy cows: **↓30 Kt CO₂e** per year or **↓300 Kt CO₂e** over 10 years
- **Accelerate performance** with adoption? **↓400 Kt CO₂e** over 10 years
- Future changes can **enhance mitigation** – potential to double efforts? : **↓600-800 Kt CO₂e**
Direct methane, adjust weightings, less replacements, dairy-beef

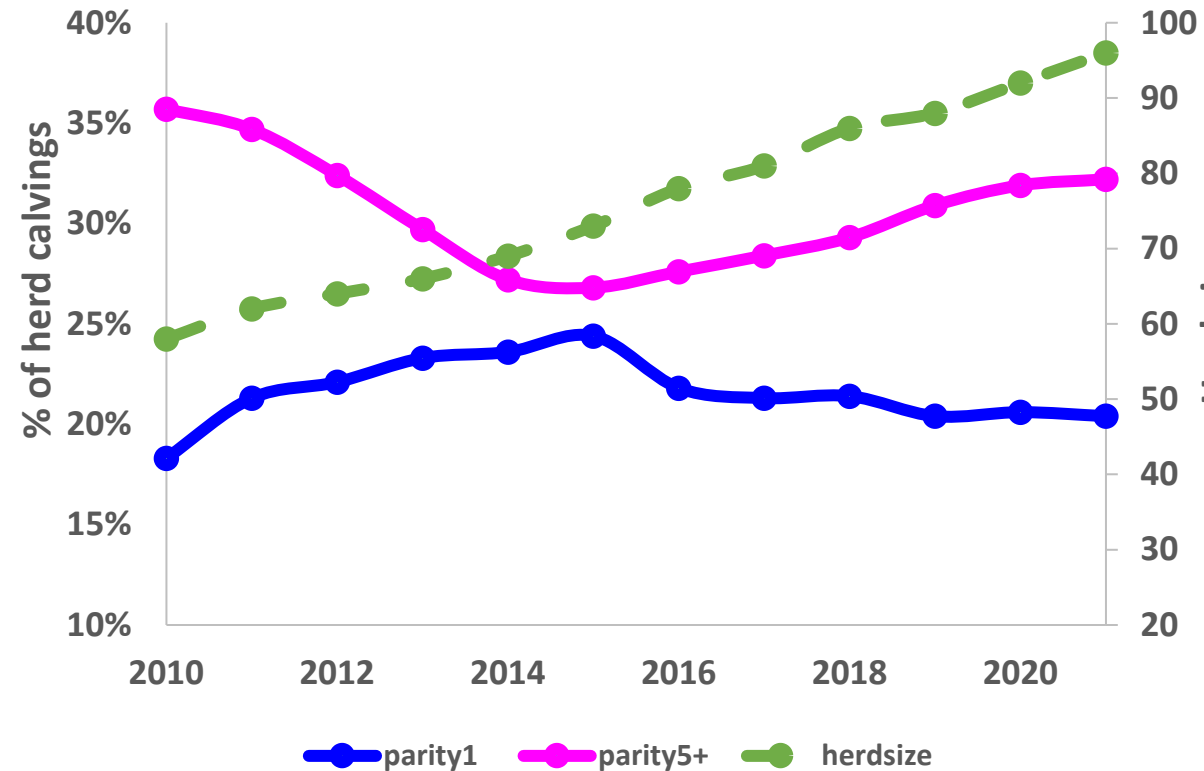
What will the cow of 2030 look like?

Predicted genetic trends into the future



- Genetic correlation between current and new EBI 0.96 is strong
- Genetic gain to continue
- Some changes in gains

Dairy Herd Parity profile



- Increased emphasis on improved fertility will provide more mature cows produce with a lower replacement requirement

Where will farmers see the changes?

- Herd reports
- Online profiles
- Animal search
- Catalogues
- Active bull lists



Carbon Sub Index breakdown

Date of Evaluation	Index Trait	PTA	* Carbon Cost	(€) Contribution PTA * Carbon Cost
Oct 2022	Milk Sub Index			-22.31
	Milk (kg)	483.00	-0.01	-4.83
	Fat (kg)	21.99	-0.37	-8.14
	Prot (kg)	21.89	-0.44	-9.54
	Fertility Sub Index			8.56
	Calving Interval (days)	-4.62	-1.46	6.75
	Survival (%)	1.82	1.12	1.81
	Calving Sub Index			2.37
	Gestation Length (days)	-2.58	-0.92	2.37
	Beef Sub Index			-6.51
	Carcass Weight (kg)	-0.30	-0.53	0.16
	Age of Slaughter (days)	15.51	-0.43	-6.67
	Maintenance Sub Index			-6.20
	Live WT (kg)	20.00	-0.31	-6.20
	Total Carbon Sub Index			-43.73

* Based on an €50/tonne carbon price

HerdPlus
Profit through Science
Call 023-8820452

Economic Breeding Index (EBI) Herd Summary - Oct 2022TEST



Report Date: 07/11/2022 (TEST Evaluation)

Herd Owner:

Herd No:

Snapshot of your herd
based on the 07-NOV-22

1. EBI Herd Summary

Average EBI for all dairy cows with; (i) a known sire (or milk recorded progeny with a known sire) and (ii) are currently on your farm.

* Number of animals that are missing an EBI result

Animal Group	Num of Cows	Milk Kg Fat Prot %	Surv% CI Days	Milk	Fertility	Carbon	Calv	Beef	Maint	Mgmt	Health	EBI €
Cows with EBI	152	52		€ 66	€ 94	€ 4	€ 37	€ -7	€ 10	€ 3	€ 6	€ 213
Missing EBI*	0	10.5 0.15	2.6									
Total Cows	152	8.4 0.12	-4.9									
1st Lactation	30	112		€ 90	€ 104	€ 1	€ 42	€ -8	€ 10	€ 2	€ 2	€ 243
2nd Lactation		15.7 0.20	2.8									
		11.5 0.13	-5.5									

Where will farmers see the changes?

ICBF Dairy Active Bull List

Help

Bulls with an EBI reliability% > 35% and an overall Calving Difficulty reliability% > 70% (based on 23% heifer rel% and 77% cow rel%) with > 50 dairy calving records are included
 (Bulls of breeds other than genomically tested HolFR have to have a daughter proven production proof (along with relevant calving of data) to make the active bull list.)

Evaluation Date: May 2022

Bull Details								EBI Details			EBI Sub-Indexes					Calving Difficulty Details				Semen Details					
Rk	Code	Bull Name	Sire	Main Breed	Herd Book Status	HO %	GI	EBI €	Rel %	Proof Source	Milk	Fert	Carbon	Calv	Beef	Maint	Mgt	Health	Risk of Dairy Heifer CDWT	Dairy Heifer CD%	Dairy Cow CD%	Dairy Calv Recs	Avail	Price	Supplier
1	FR7289	(J)CAPPAUNAC ARAMAX	FR4728	HO	PED	84	No	304	90	GS	80	197	-1	59	-3	9	0	12	Low	5.4	1.8	80	Low	20	NOBC
2	FR7143	(J)TISAXON TROOPER	FR4728	HO	PED	81	Yes	303	90	GS	94	201	0	47	-17	23	2	13	Moderate	7.0	2.4	785	Medium	20	NOBC
3	FR6481	BROWNIE BARNA SRM	FR4717	HO	SRM	89	Yes	307	90	GS	107	178	-3	54	-4	7	4	11	Low	6.6	2.3	1404	High	22	Doves
4	FR6439	(J)OAKFARM BEHNS ZEUS	FR4728	HO	PED	78	Yes	357	98	GS	100	178	8	54	-17	19	4	18	Low	2.7	2.0	582	Medium	20	NOBC
5	FR0047	(J)STAMULLEN LUNASA SRM	FR4008	HO	SRM	89	Yes	300	98	GS	80	183	11	54	-3	23	-1	14	Low	0.0	2.0	277	Medium	20	NOBC
6	FR6484	RIVERSIDE PIVOTAL B74 SRM	FR4728	HO	SRM	78	Yes	353	90	GS	107	178	-5	52	-16	17	2	14	Low	4.8	2.0	2402	High	22	Doves
7	FR6989	(J)BALLINROE XAAR	FR4728	HO	PED	83	Yes	352	98	GS	108	172	10	58	-16	27	3	8	Low	5.3	2.5	381	Medium	20	NOBC
8	FR0049	(J)KILFEACLE DANZIG	FR4728	HO	PED	84	Yes	340	90	GS	100	175	-3	01	-0	11	0	-2	Low	4.8	2.3	383	Medium	20	NOBC
9	FR7047	(J)BAURMILLA PISTOL SRM	FR4728	HO	SRM	76	Yes	340	90	GS	119	172	19	42	-12	14	7	5	Low	6.6	2.4	788	Low	20	NOBC
10	FR7038	DUNGORMAN EDDIE SRM	FR4728	HO	SRM	72	No	344	98	GS	123	187	13	48	-10	10	1	5	Low	3.8	2.0	160	Medium	18	Doves
11	FR7107	IG MUIHEMOR HUBER	FR4800	HO	XSR	56	Yes	343	98	GS	94	186	6	51	-23	18	10	8	Low	3.7	2.0	251	Medium	20	NOBC
12	FR6778	(J)KILBALLY SUGARHILL SRM	FR4728	HO	SRM	76	Yes	341	90	GS	97	168	10	53	-5	12	1	0	Low	2.4	2.0	329	Medium	20	NOBC
13	FR7020	(J)TOWNROCHE TURBO	FR4513	HO	PED	72	Yes	337	91	GS	111	155	-1	53	-3	8	1	5	Low	5.5	2.1	618	Medium	20	NOBC
14	FR0051	WATERPARK HECTOR	FR4728	HO	PED	72	No	333	98	GS	90	155	15	74	-7	12	9	1	Low	4.0	1.9	348	High	14	Boya AI


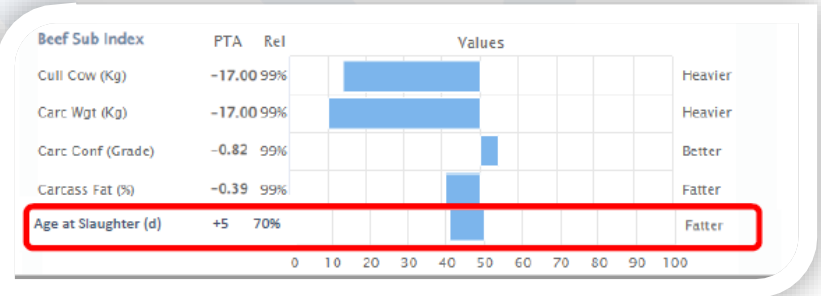
Beef sub-index

Age at slaughter **New!**

Carcass specifications **New!**

Progeny Carcass traits


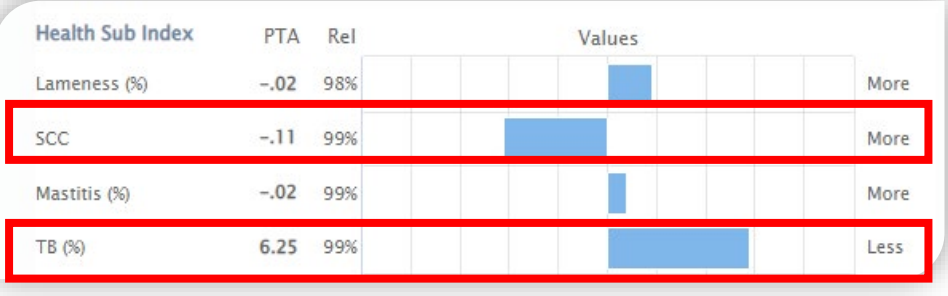
BASE

Health sub-index

SCC **UPGRADE**

TB **New!**

Summary

New Carbon sub-index - 22nd November in EBI

- Ireland set target to reduce GHG emissions by 25% or 5.75 Mt CO₂e
- Breeding target = 1.2 MT or 21% of total target : **EBI key to drive change**

New traits and updated Beef sub-index

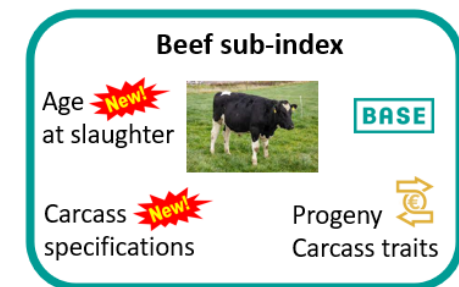
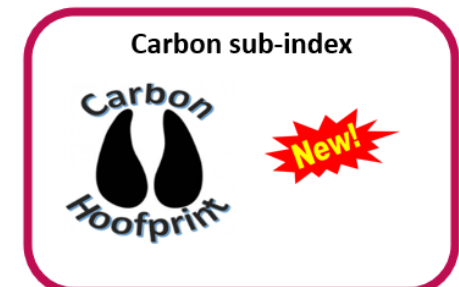
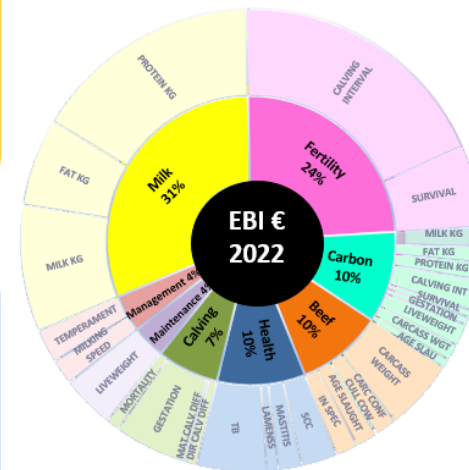
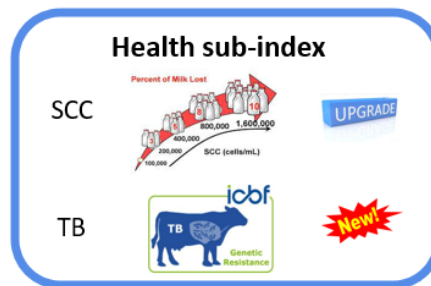
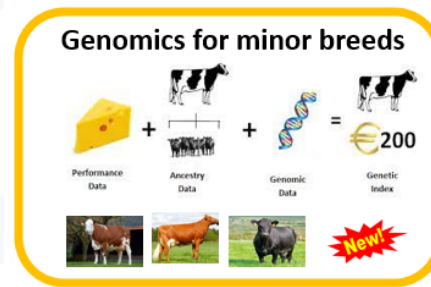
- More calves coming off dairy herd will be in spec and finish earlier

New & updated traits in Health sub-index

- Opportunity to ↓ prevalence TB
- Updated SCC model more accurate

Inclusion of genomics for minor breeds

- Genotyping available – more accurate evaluations



Genetic gain achievable while meeting environmental and industry targets

Our Farmer & Government Representation



An Roinn Talmhaíochta,
Bia agus Mara
Department of Agriculture,
Food and the Marine



Our AI & Milk Recording Organisations



Our Herdbooks



Acknowledging Our Members