A dairy-beef index to rank beef bulls on profitability when mated to a dairy cow

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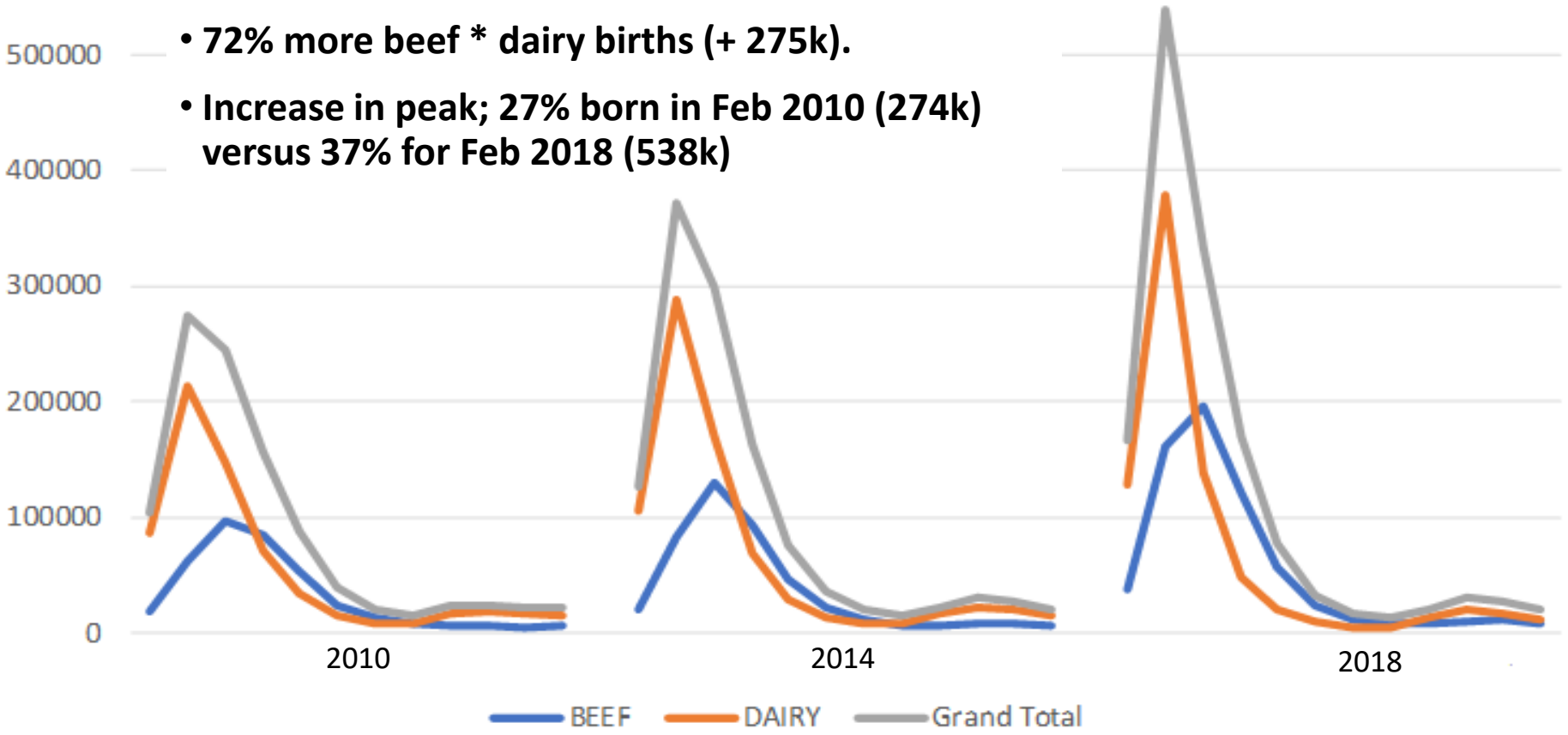
Number of dairy-bred calves is increasing

- 40% more births from dairy herd (+ 414k)
- 72% more beef * dairy births (+ 275k).
- Increase in peak; 27% born in Feb 2010 (274k) versus 37% for Feb 2018 (538k)



Slaughter performance of dairy* beef steers by age & month of slaughter.

Month_Year	Age Category	Age	Count	Cwt	Price/kg	Value	Conf	Fat
2 year old out of shed								
2015_03	22-25 months	726	5,830	320	420.0	€1,344	5.90	8.83
2016_03	22-25 months	728	7,913	328	398.5	€1,307	5.88	9.00
2017_03	22-25 months	729	9,724	324	390.8	€1,266	5.68	8.85
2018_03	22-25 months	729	8,854	323	401.7	€1,297	5.63	8.81
2+ years off grass								
2015_07	25-28 months	825	4,995	338	437.3	€1,478	5.86	9.20
2016_07	25-28 months	827	6,234	337	395.0	€1,331	5.67	8.96
2017_07	25-28 months	828	7,101	336	409.0	€1,374	5.57	8.97
2018_07	25-28 months	828	6,620	328	397.7	€1,305	5.35	8.22
2.5 years of grass								
2015_09	28-30 months	896	8,144	351	402.5	€1,413	5.98	9.01
2016_09	28-30 months	898	11,222	348	379.6	€1,321	5.66	8.58
2017_09	28-30 months	898	12,176	348	381.8	€1,329	5.51	8.88
2018_09	*Not avail*							

- Definite decline in conformation of dairy beef steers over last 3-4 years. From O+ (on average) to O=.
- Also a decline in carcass weights.

The challenges

1. **With a growing dairy herd, the quality of Irish beef production is at risk of deterioration**

2. **Good fertility and survival equates to a greater proportion of beef sire usage on dairy cows**

3. **Dairy farmers focused on dairy farmers**

   - **Easy calving, short gestation length bulls**

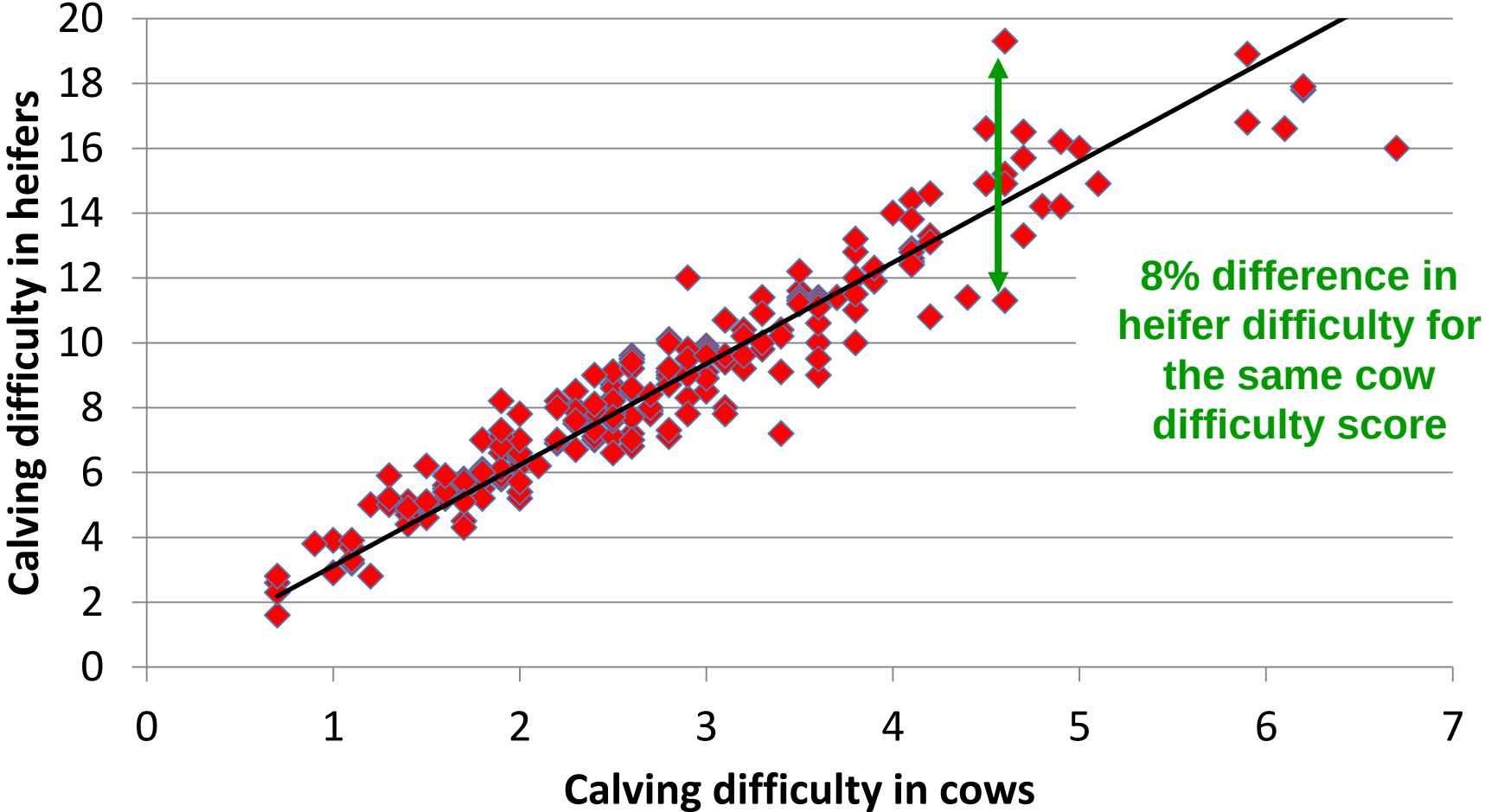
Need a dairy-beef index that….

1. Strikes a sensible balance between calving ease and carcass merit
2. Is scientifically sound, robust and defendable
3. Facilitates identification of beef bulls suitable for heifers
4. Incentivises beef breeders to target the dairy industry as a market
5. Incentivises beef breeders targeting the dairy industry to record appropriate traits accurately

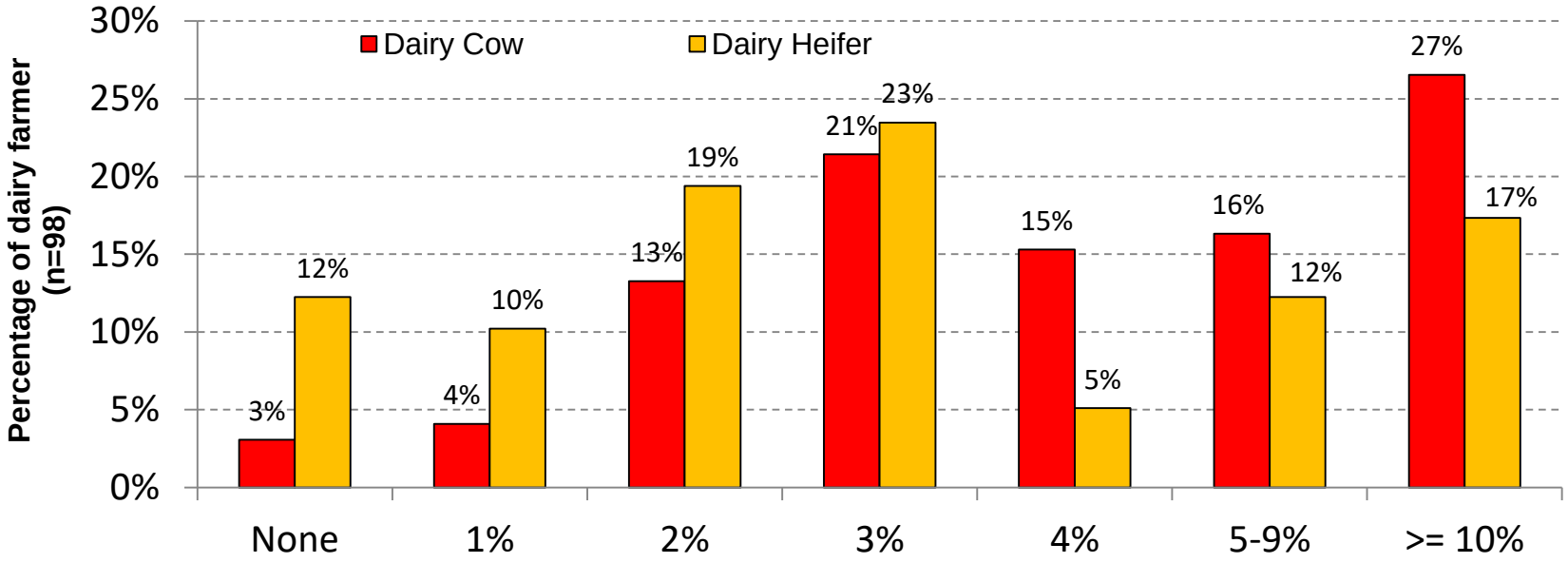
Traits

Sub-index	Trait	% genetic
Calving	Calving difficulty	10%
	Gestation length	35%
	Calf mortality	2%
	Calf vigour	Under research
Efficiency	Feed intake	33%
	Environmental footprint	Under research
	Age at slaughter	13%
Carcass	Carcass weight	35%
	Carcass conformation	35%
	Carcass fat	35%
	Ability to meet carcass specs	
	Meat quality	16%
Societal	Docility	20%
	Polled	100%

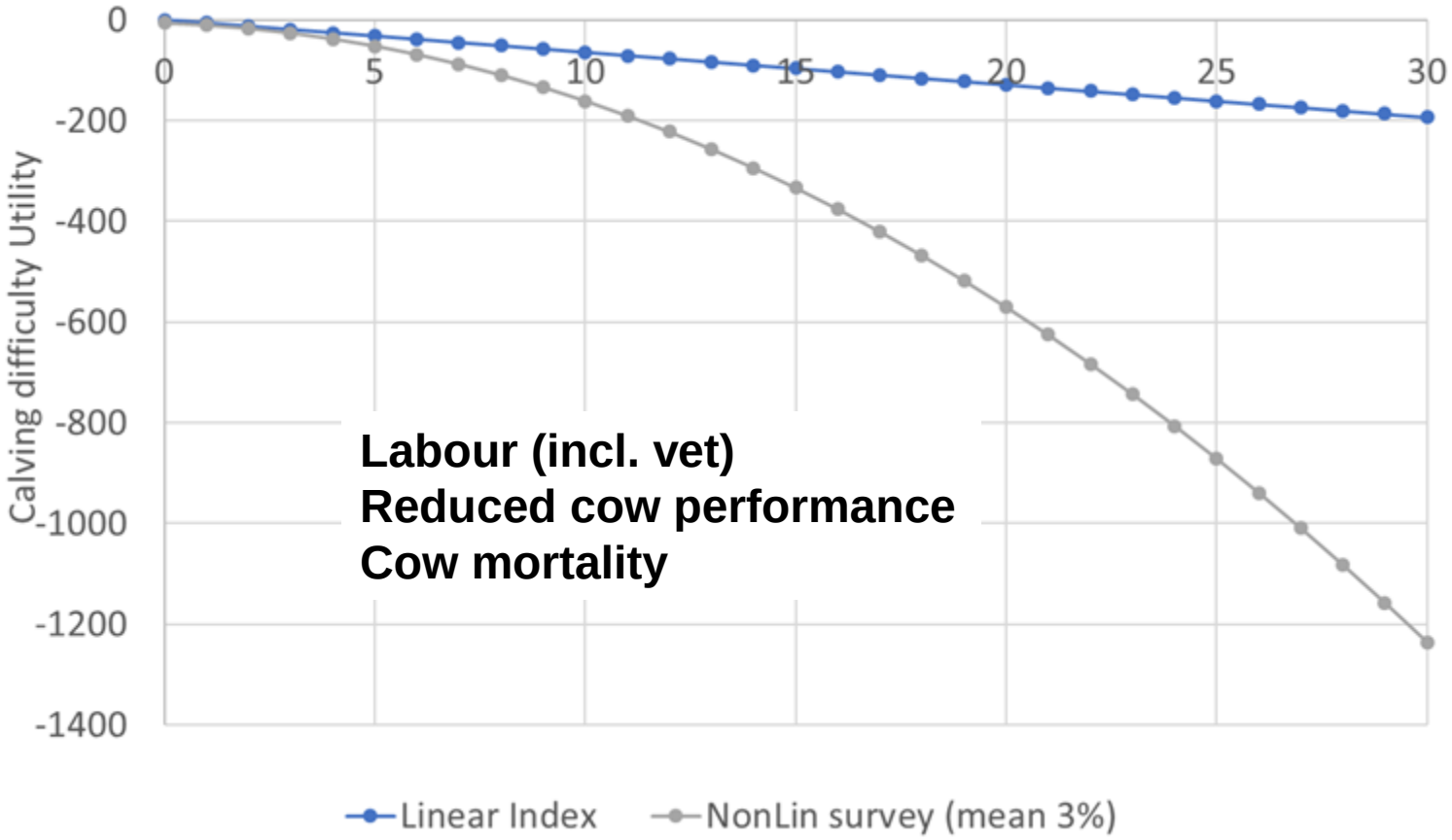
Calving difficulty (heifers v cows)



Max level of acceptable difficulty



Penalising more difficult bulls more



Suitability for heifers

- **Risk of calving difficulty**
  - **Bull genetic merit**
  - **Reliability of bull genetic merit**
  - **Cow**
  - **Cow management**

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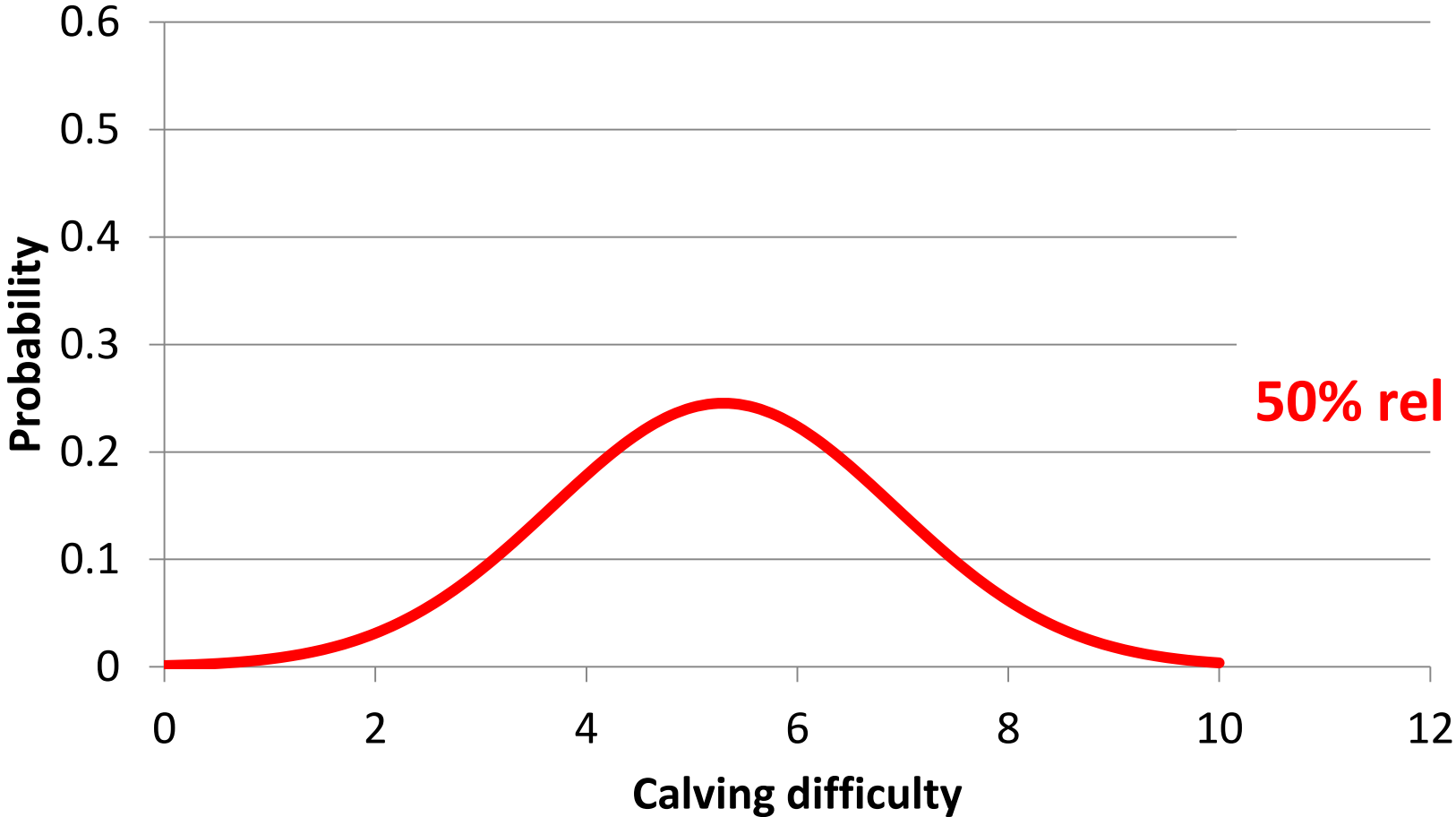

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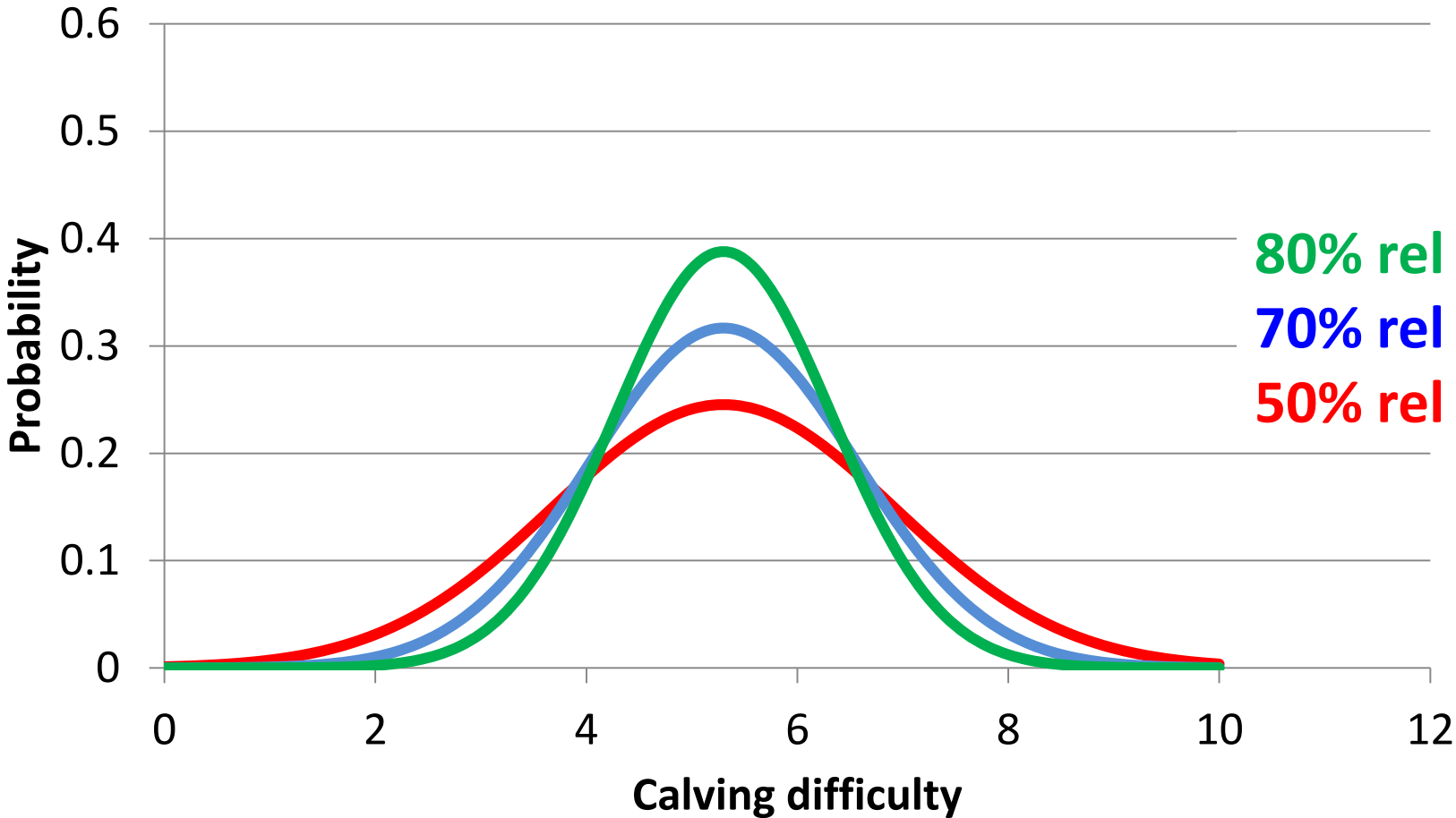
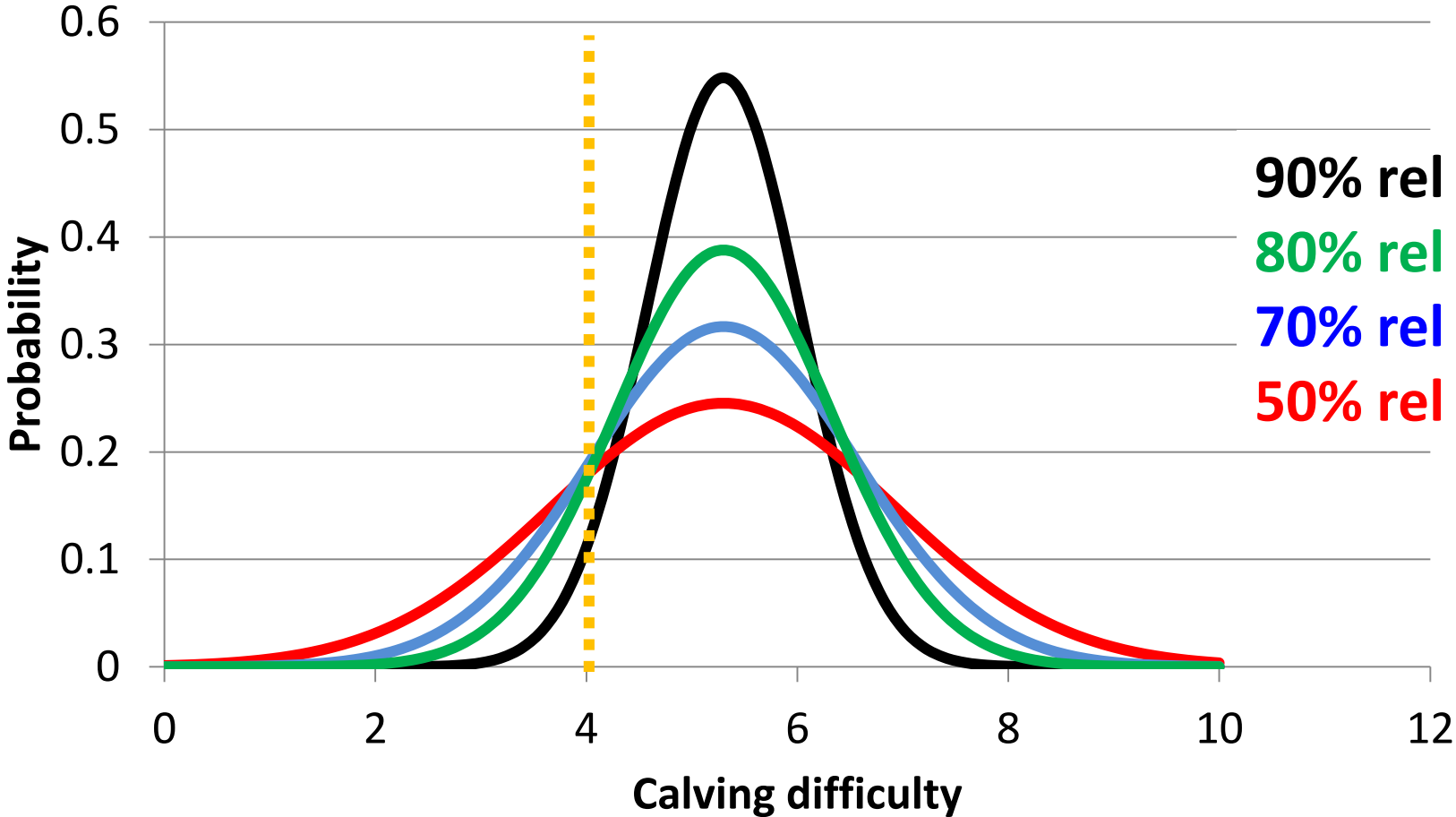
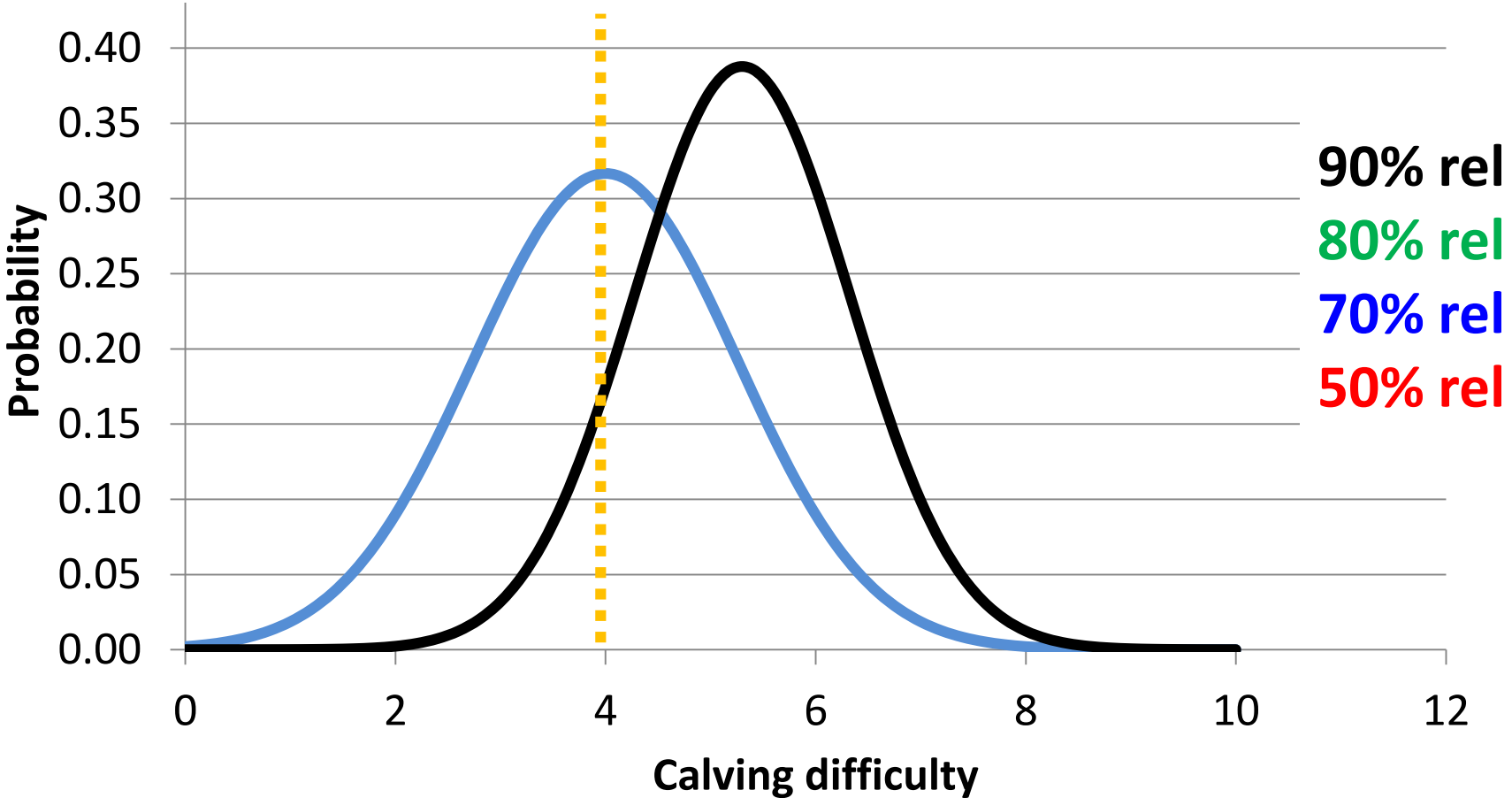


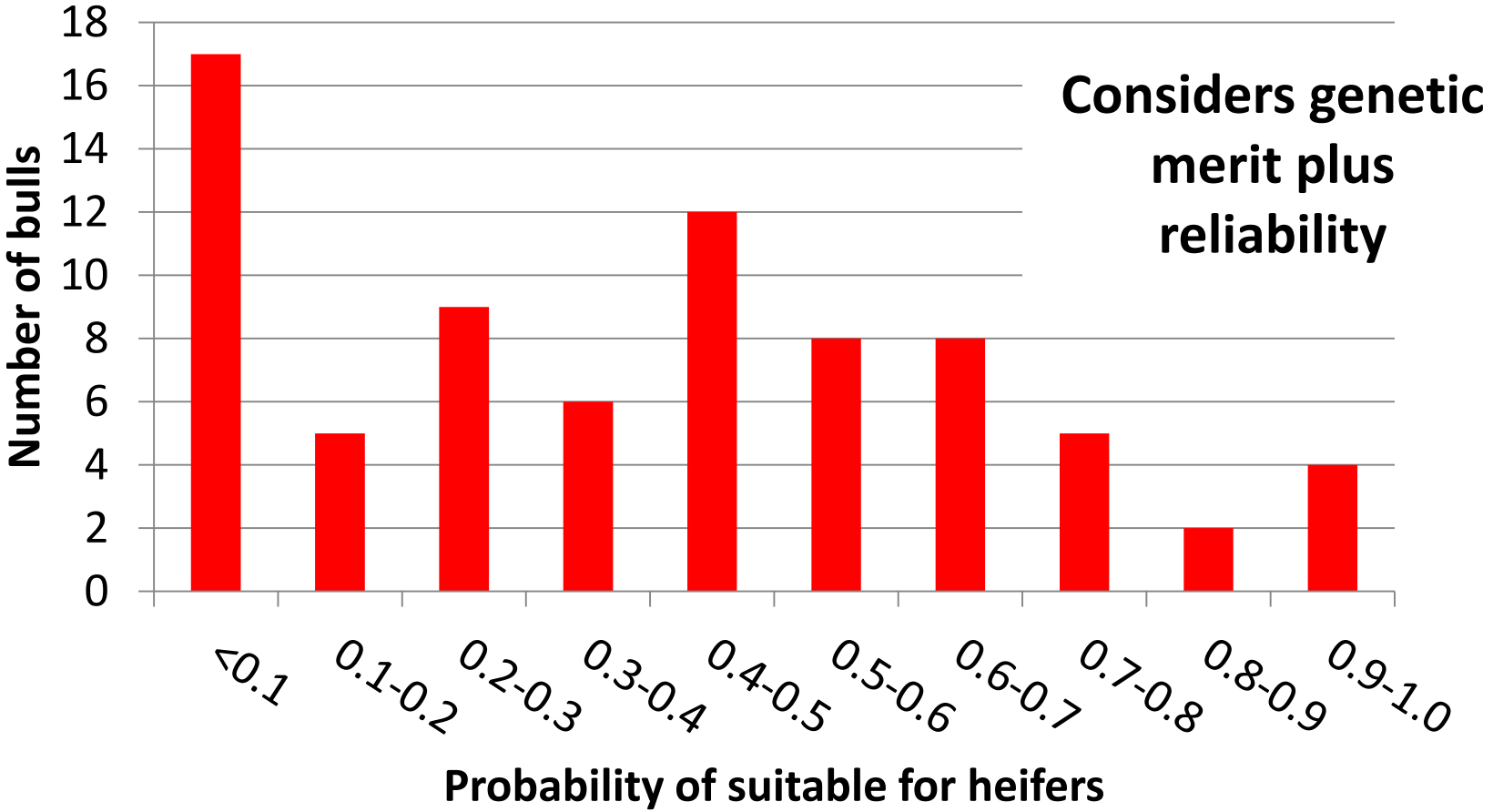
Suitability for heifers



Suitability for heifers



Suitability for heifers – Angus AI bulls



Other calving traits

- Gestation length
  - Slippage in calving date – cost of production
- Calf mortality
  - Opportunity cost of 28-day old calf

- Impact of calving difficulty on calf mortality captured in calf mortality genetic merit
- Impact of short & long gestation on calving difficulty & calf mortality captured in respective genetic merit

Efficiency traits

- Daily feed intake
  - Tully - 600 animals per year
  - GREENBREED – measure daily emissions
- Age at slaughter
  - Total feed intake and environmental footprint
  - >80 days difference in age at slaughter for 1 v 5 star animals
  - Work in progress

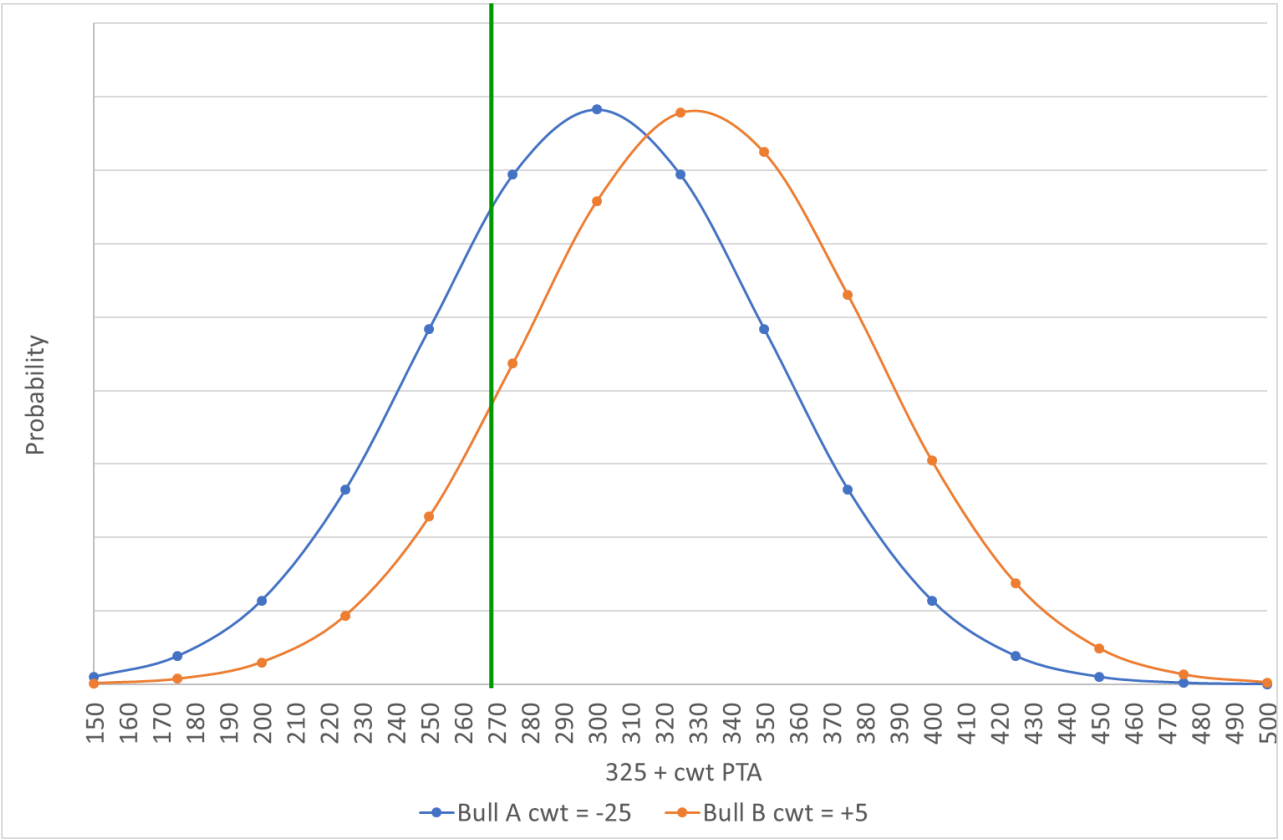
Carcass traits

- Carcass weight, conformation and fat score
  - Based on associations with cut yields
- Meat quality
  - Breed bonuses
  - Genetic evaluation for meat quality underway
- Out of spec
  - 280 kg to 380 kg
  - Superior to O=
  - Rapid reduction in price/kg and loss of AA/HE bonus

Specs per breed (from dairy dams)

Breed	Number of bulls	No progeny	Carcass wt	% <280 kg	Carcass conf	% <O=	price (cents/kg)
LM	25	4834	334	10%	7.0	1%	393
BB	29	2405	351	8%	7.8	2%	388
AA	35	2309	295	32%	5.6	12%	385
HE	31	1251	316	27%	5.5	17%	365
NR	10	168	307	29%	4.2	62%	360
FR	117	2066	309	26%	4.5	51%	349
HO	509	957	303	31%	3.6	74%	348
JE	50	244	255	66%	3.3	84%	321

Example for carcass weight spec



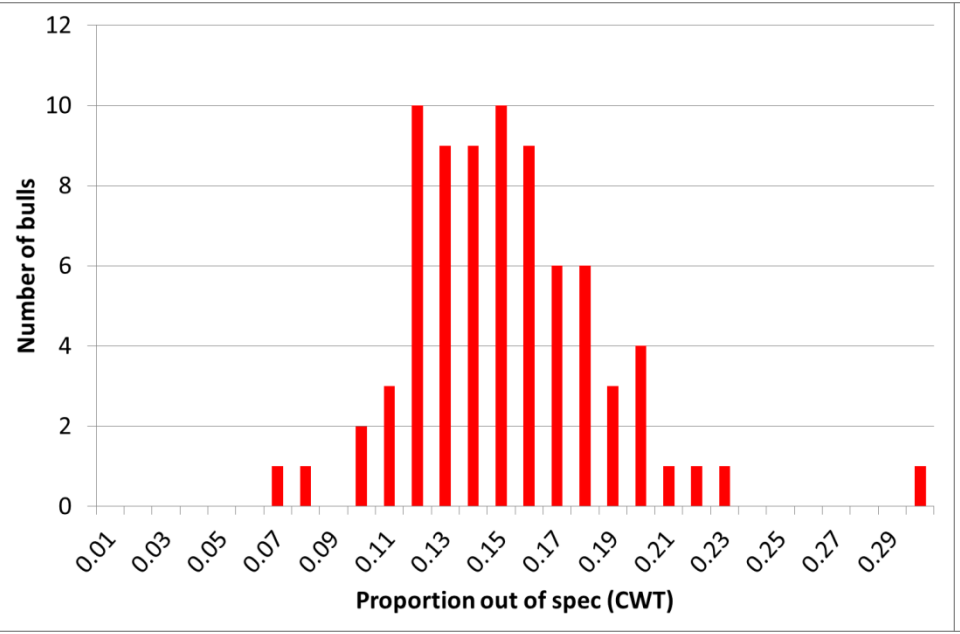
Bull A has CWT = -25

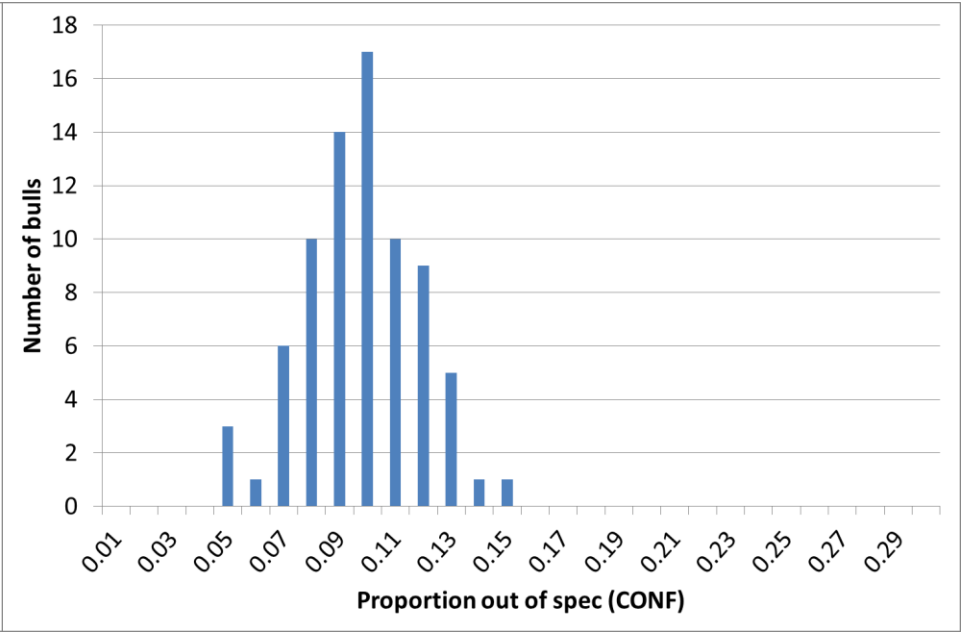
- **35% probability out of spec**
- **Penalty of €49**

Bull B has CWT = +5

- **16% probability out of spec**
- **Penalty of €23**

Out of spec – Angus active sires

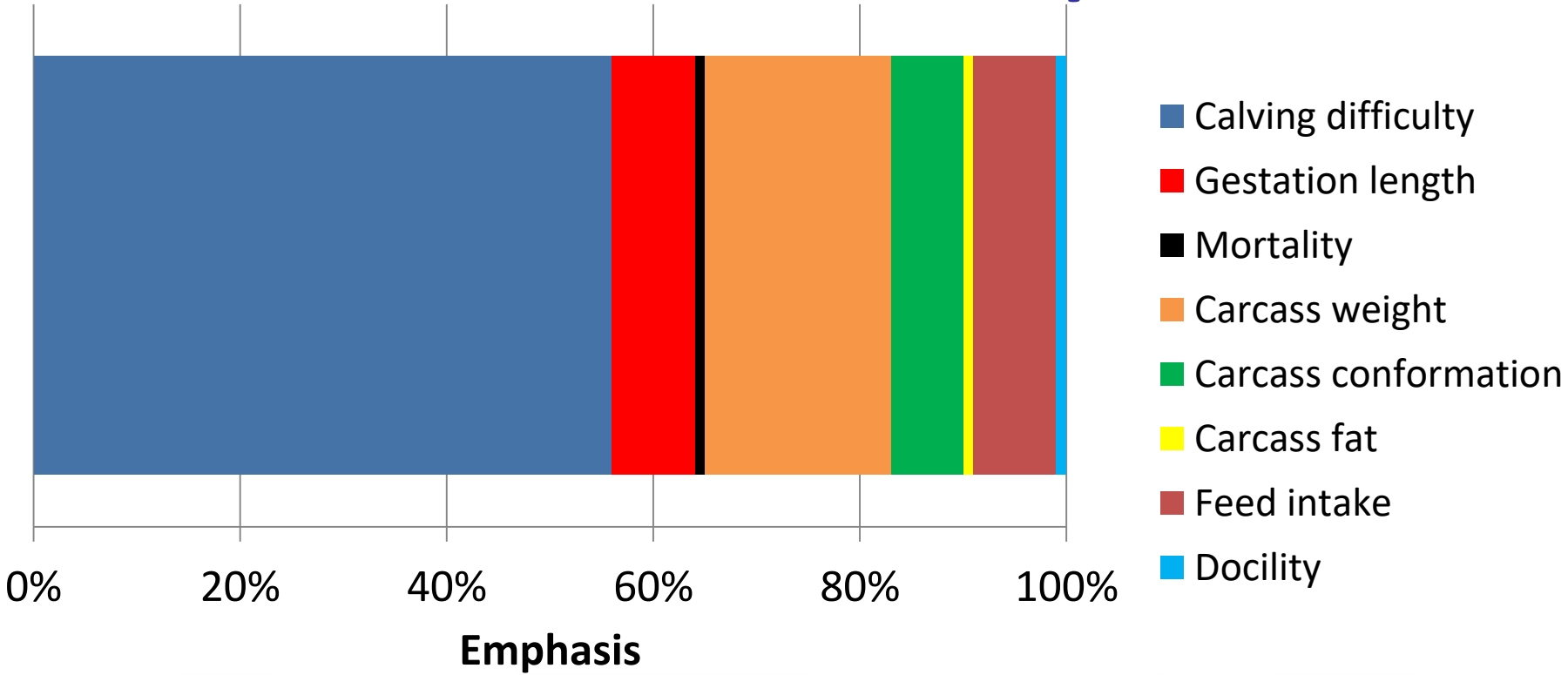




Social traits

- Docility
  - Risk of injury
  - Risk of death
- Polled
  - Cost of polling

Combined index - *Proposed*



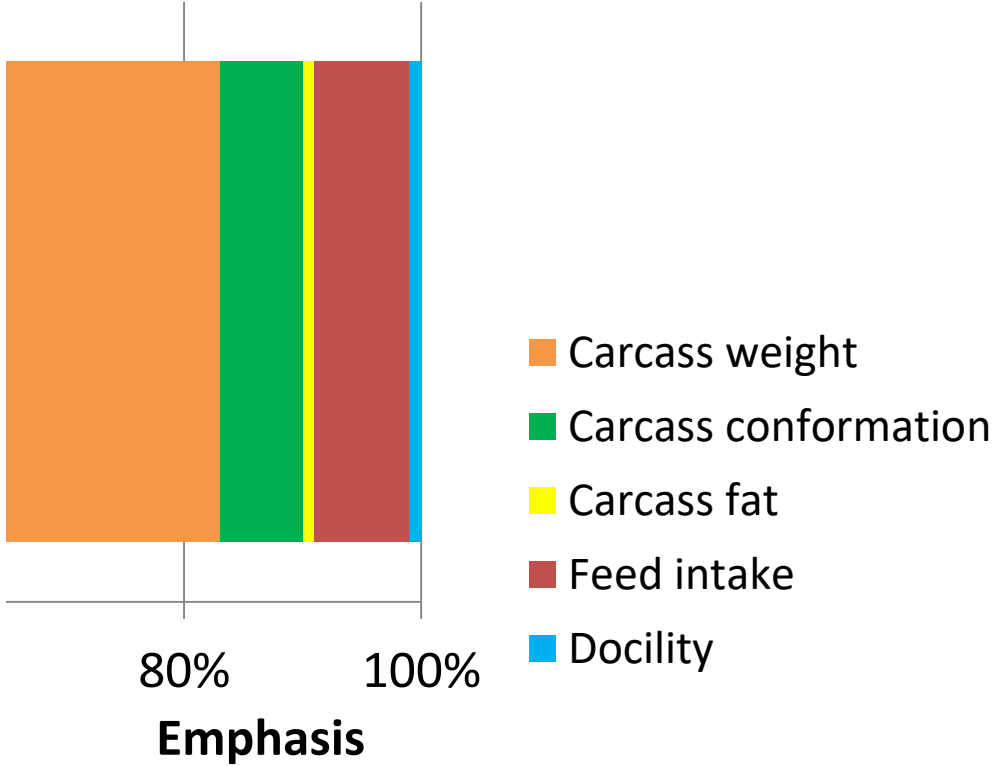
Current versus new

Index	Current Calving difficulty	Heifer difficult	Cow difficult	Prob safe on heifer	Gest	Mort	Feed intake	Carcass weight	Carc. Conf	Carc. fat	% out of spec - CWT	% out of spec Conf
Calving difficulty	1.37	6.15	2.03	66%	-1.41	-0.45	0.1	0.2	0.689	0.605	19%	9%
Top on DBI	2.61	7.85	3.23	44%	-0.43	-0.40	-0.18	12	1.429	0.01	13%	5%

Superior beef merit for minimal compromise on calving performance

Beef farmers purchasing dairy beef calves

- Current focus is a breeding index for dairy farmers.
- Once calf is born focus shifts to “profit from beef”.
  - Calving traits dropped
  - Added in non-genetic effects
- Opportunity to generate for all dairy beef calves at birth (i.e., with passport).
- Calves must be DNA verified => surety for buyer.
- Pilot project under way.



Next Steps.

- Further details
  - Minimum criterion for a bull to be included on the ICBF Active Bull List.
  - Which traits to put on the list, e.g., suitable for use heifers?
- Implementation group to meet to finalise - ICBF board in November
  - New ICBF Active Dairy Beef Bull List for AI sires for Dec 2018
- Continue work on other categories of animals, most notably young breeding bulls

Take home message

- New index to rank beef bulls for use on dairy cows
  - Compromise between the needs of dairy and beef farmers
- Massive variability exists within breeds
  - Opportunity to purchase on genetic merit rather than breed => Both for breeding & calf purchasing decisions.
- Gains to be achieved by combining all traits and minimising risks