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

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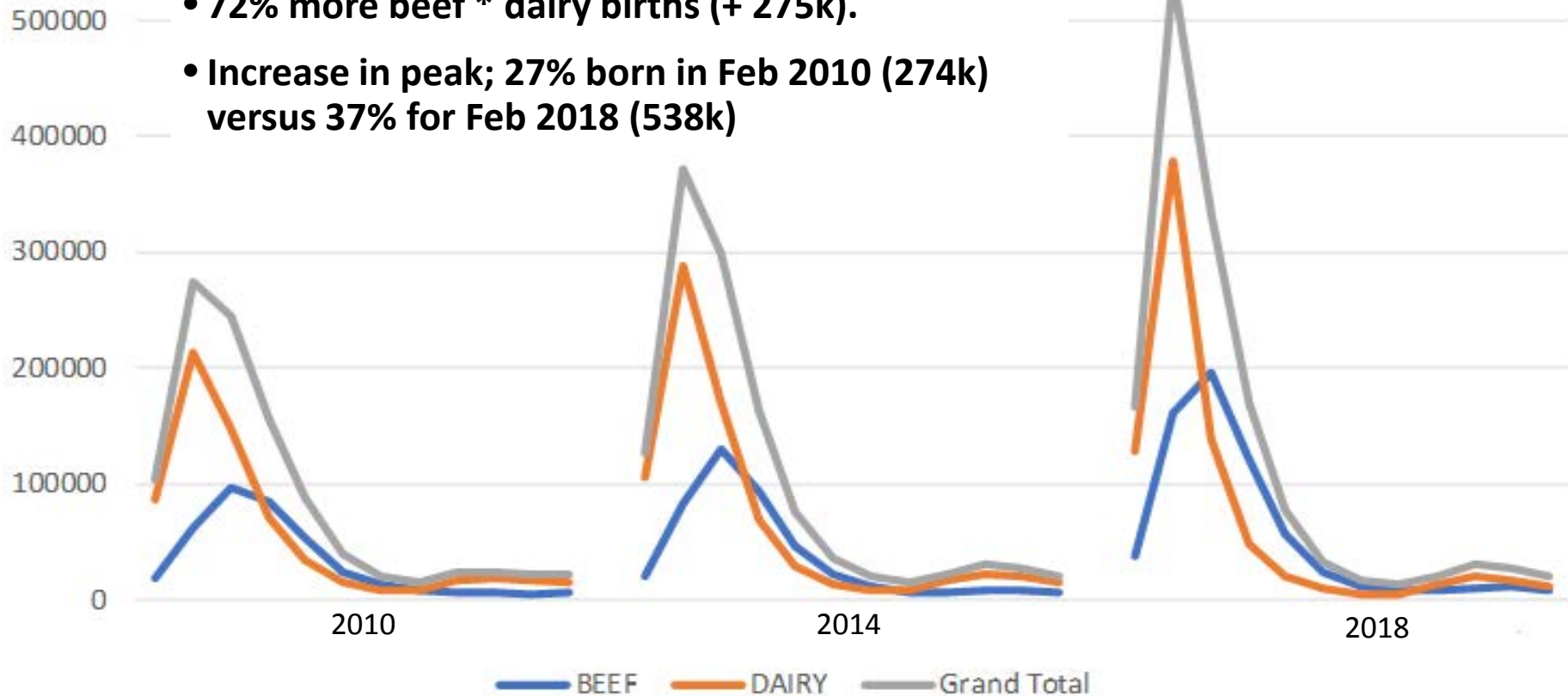
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National Beef Conference
October 2018

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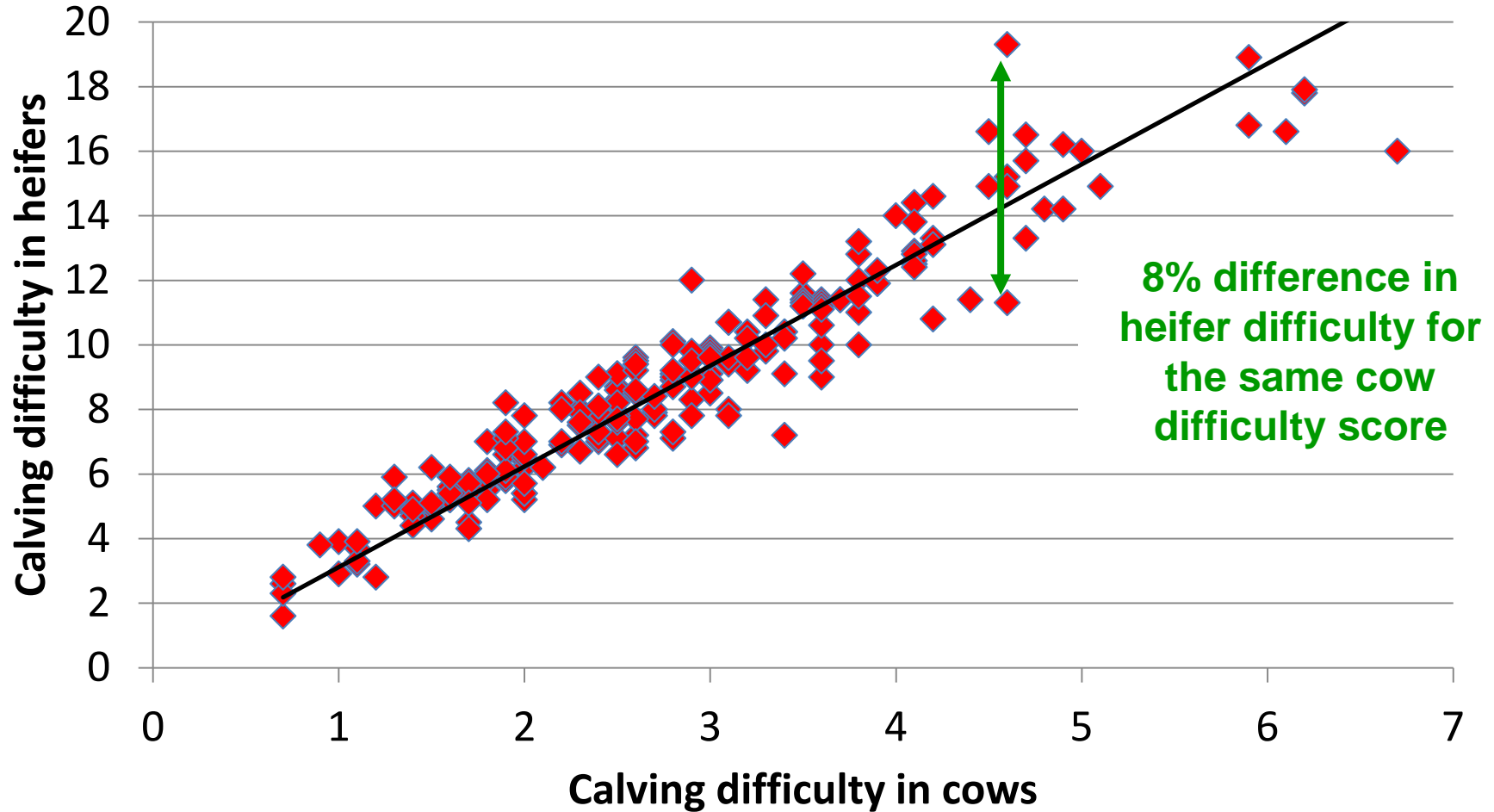
    -   **Easy calving, short gestation length bulls**

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**
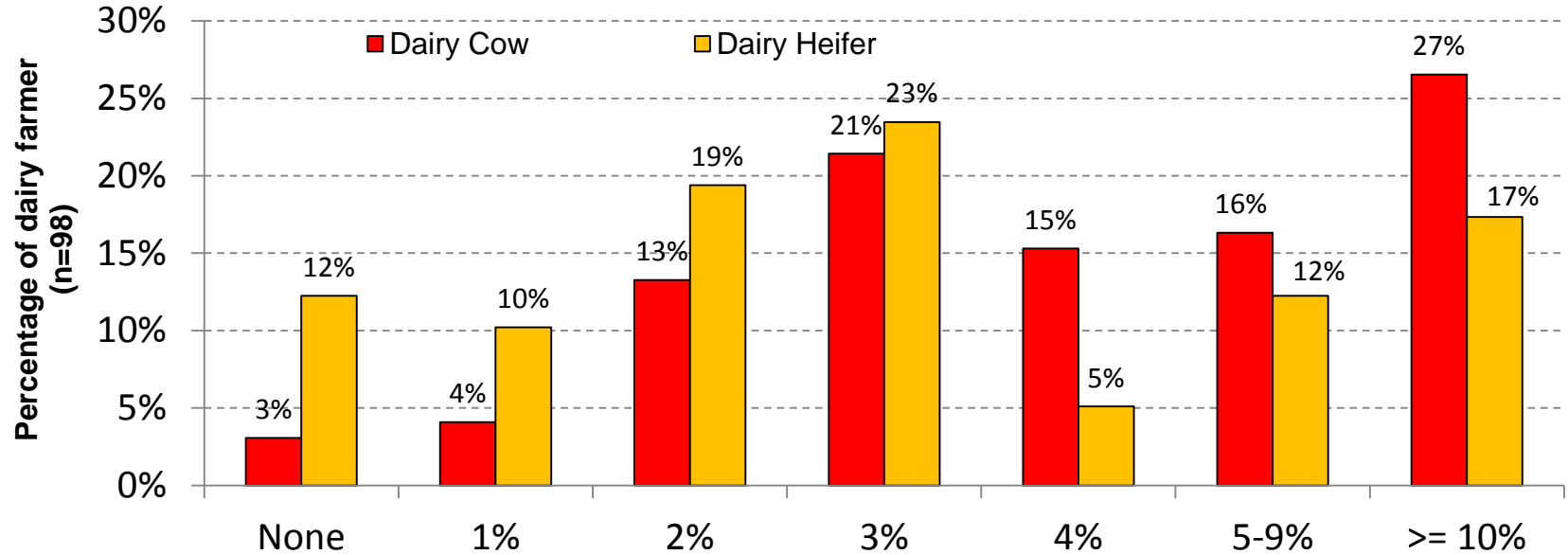
Traits

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)

8% difference in heifer difficulty for the same cow difficulty score
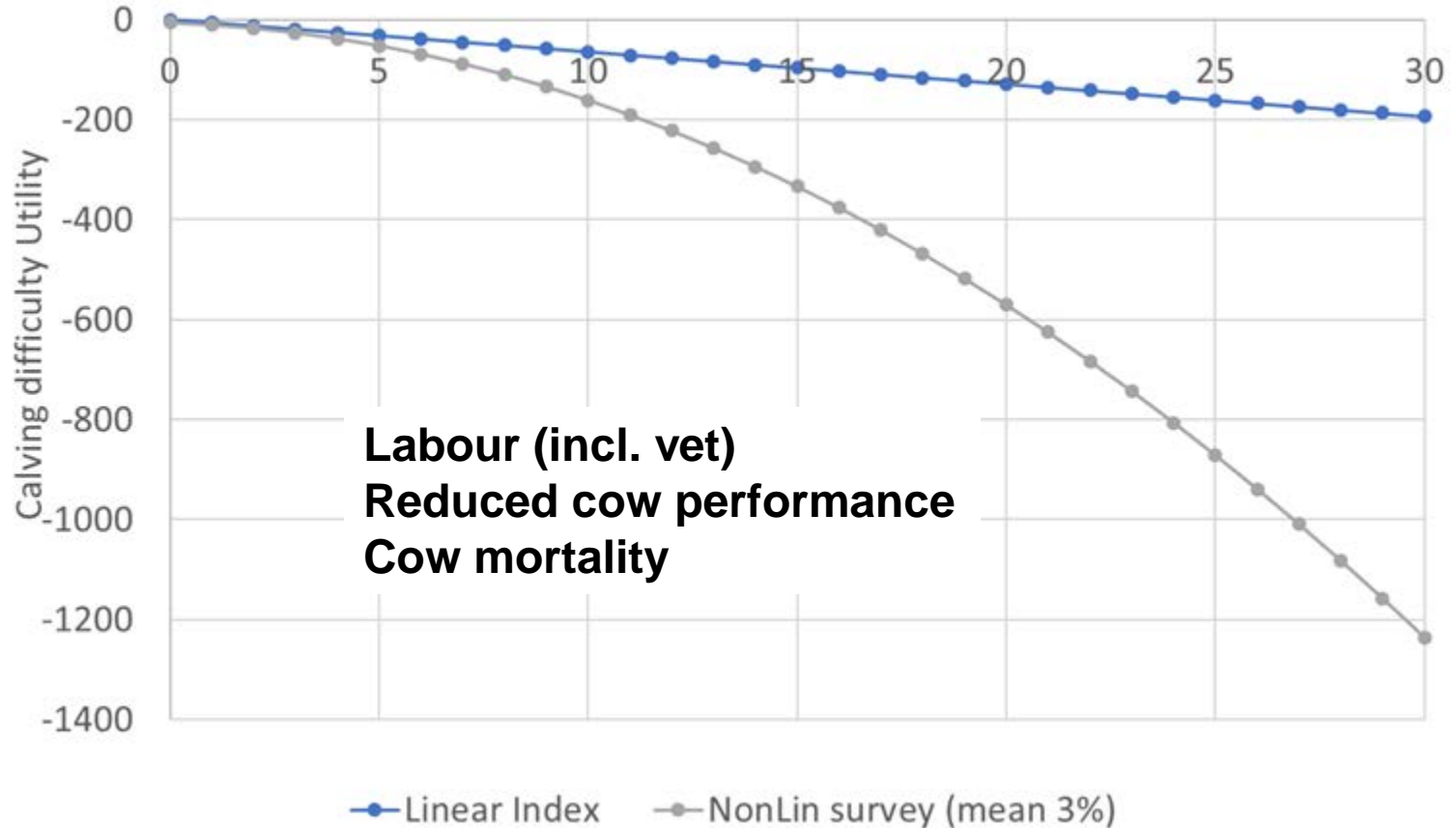
Calving difficulty in heifers

Calving difficulty in cows

Max level of acceptable difficulty

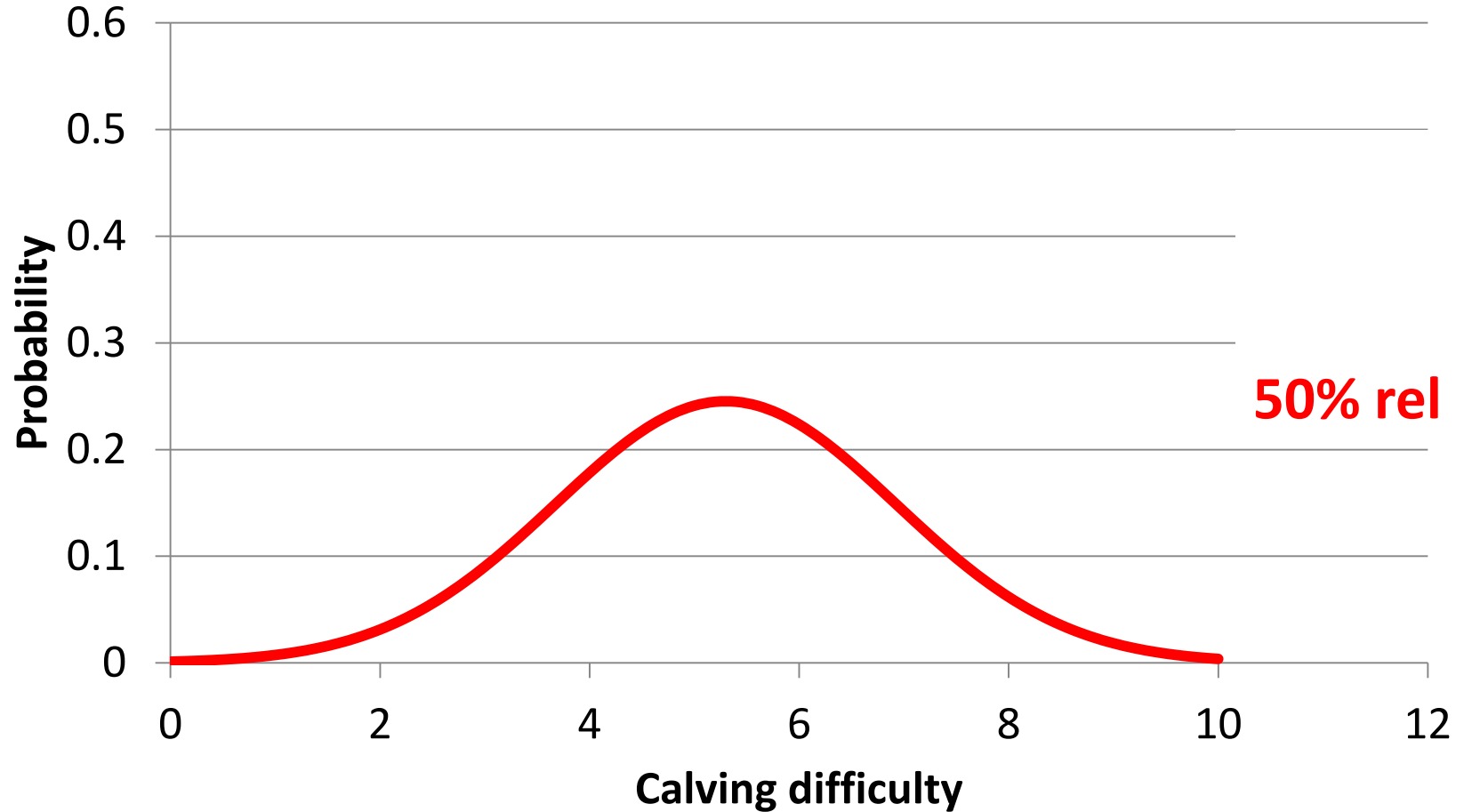# Penalising more difficult bulls more

Suitability for heifers

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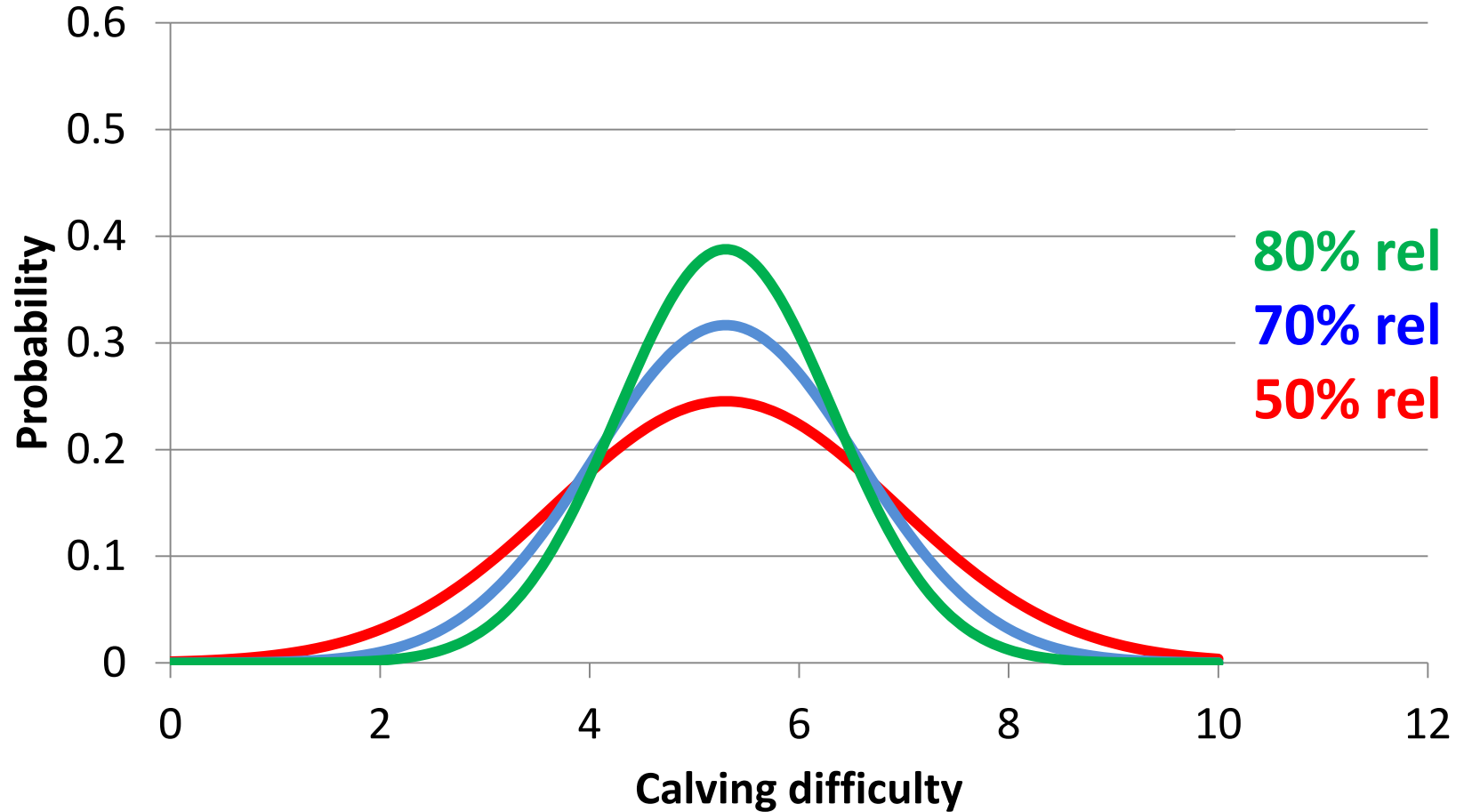 - **Cow**
  - **Cow management**

Suitability for heifers

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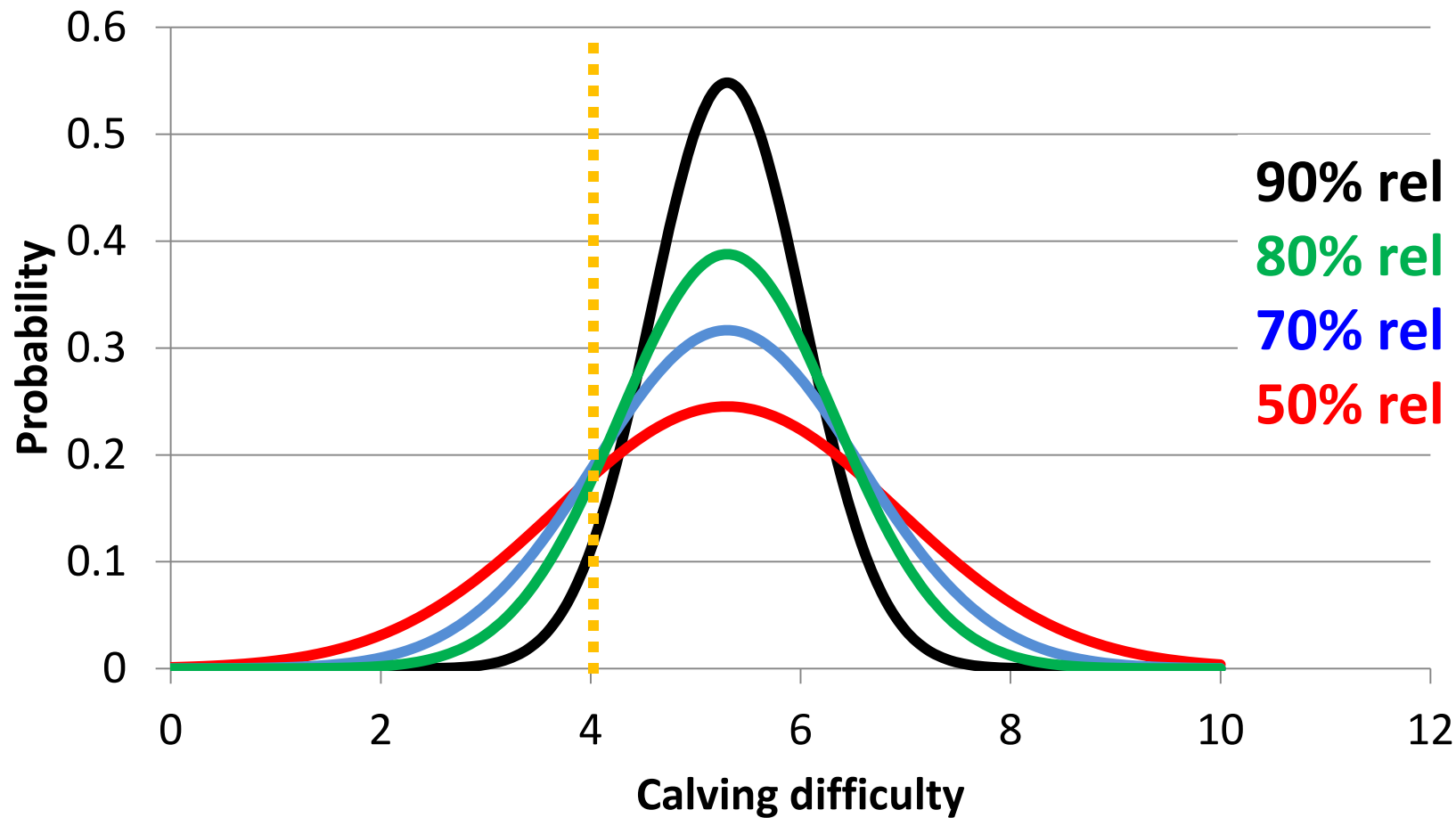 - **Reliability of bull genetic merit**
  - **Cow**
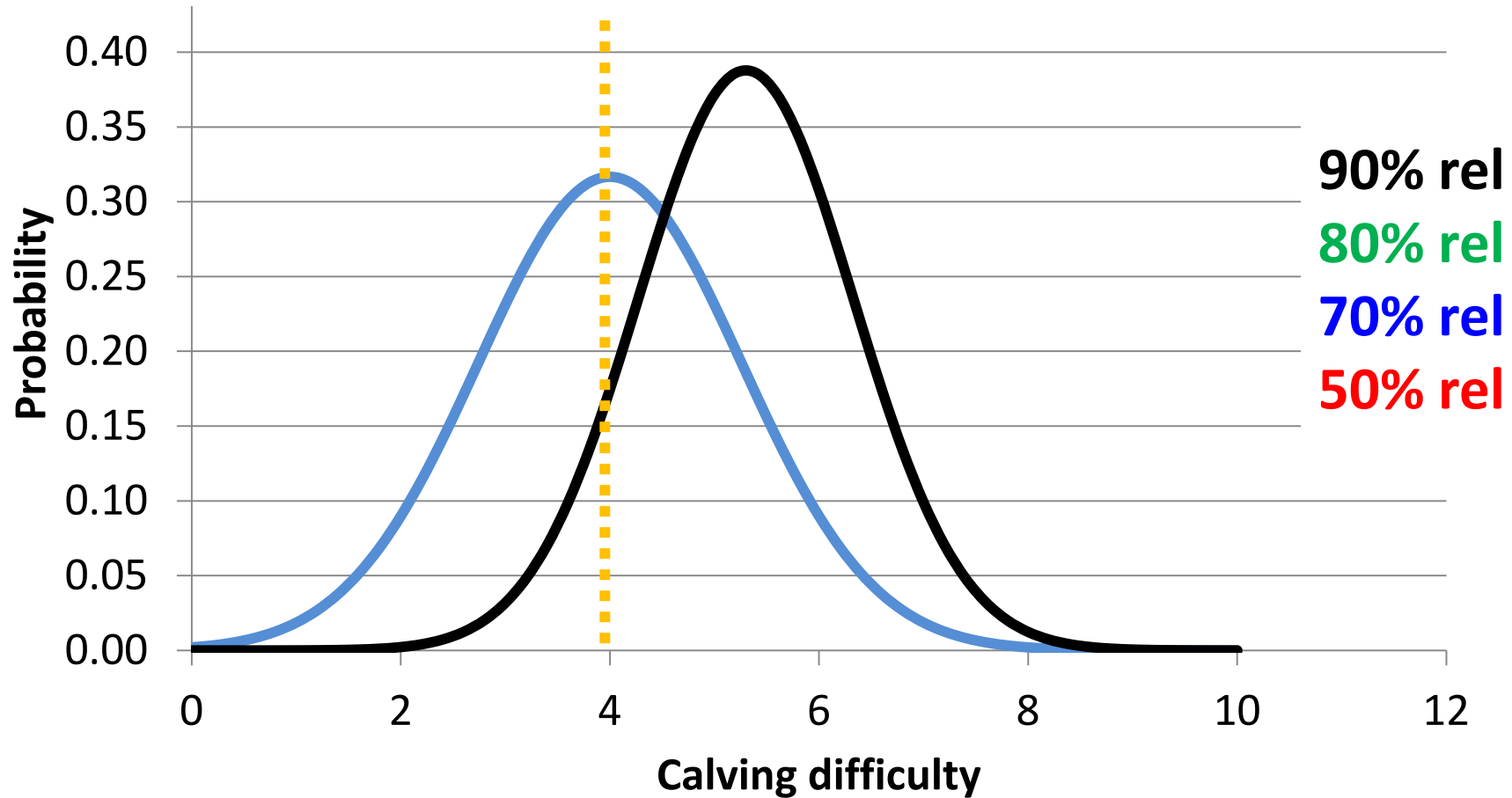 - **Cow management**

Suitability for heifers

Probability (y-axis, 0 to 0.6)

Calving difficulty (x-axis, 0 to 12)

50% rel

Suitability for heifers

80% rel
70% rel
50% rel

Suitability for heifers

Probability (y-axis): 0, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6

Calving difficulty (x-axis): 0, 2, 4, 6, 8, 10, 12

90% rel
80% rel
70% rel
50% rel

Suitability for heifers

Probability (y-axis)

Calving difficulty (x-axis)

90% rel
80% rel
70% rel
50% rel
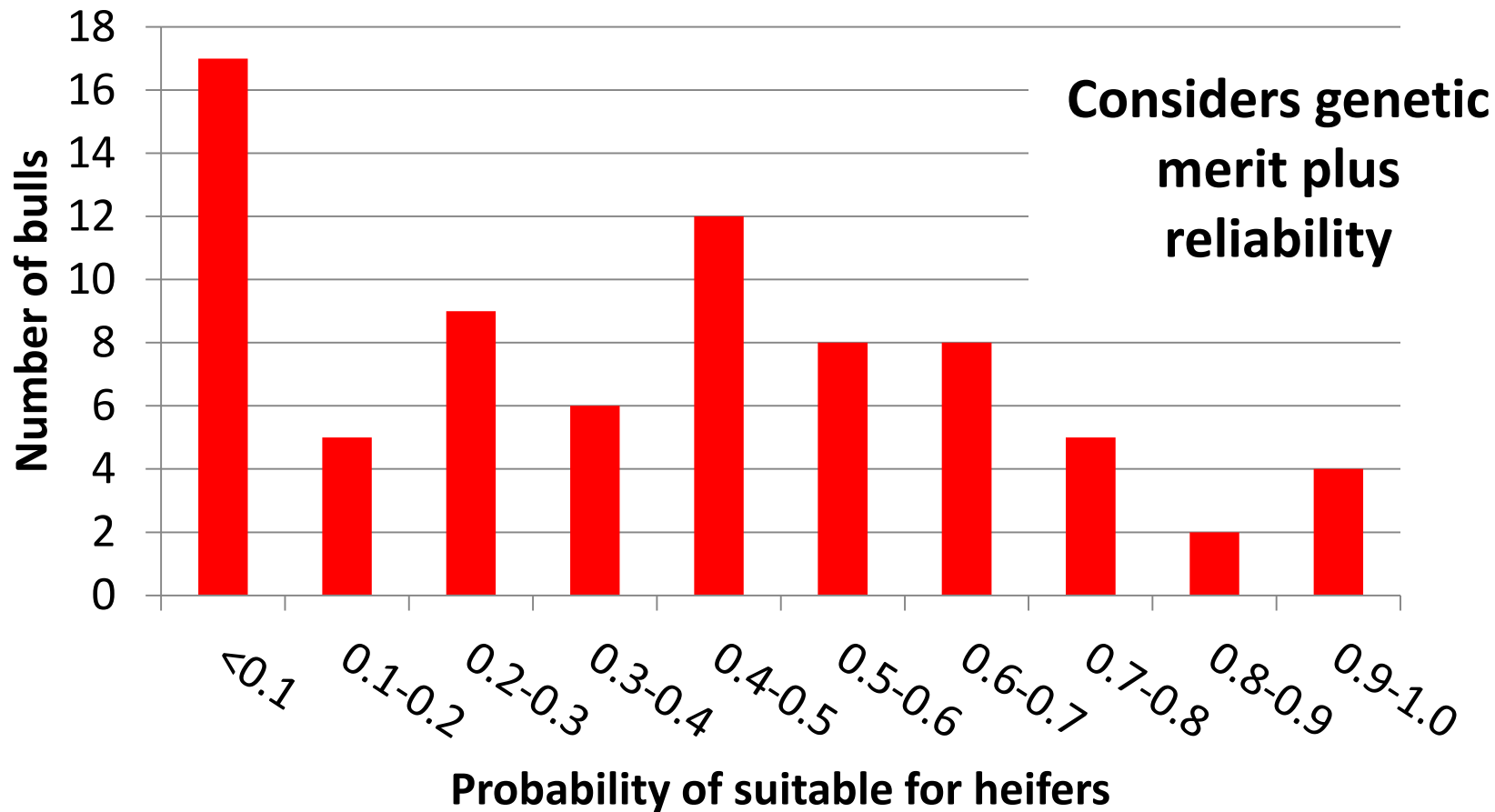
Other calving traits

- **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**

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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**

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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
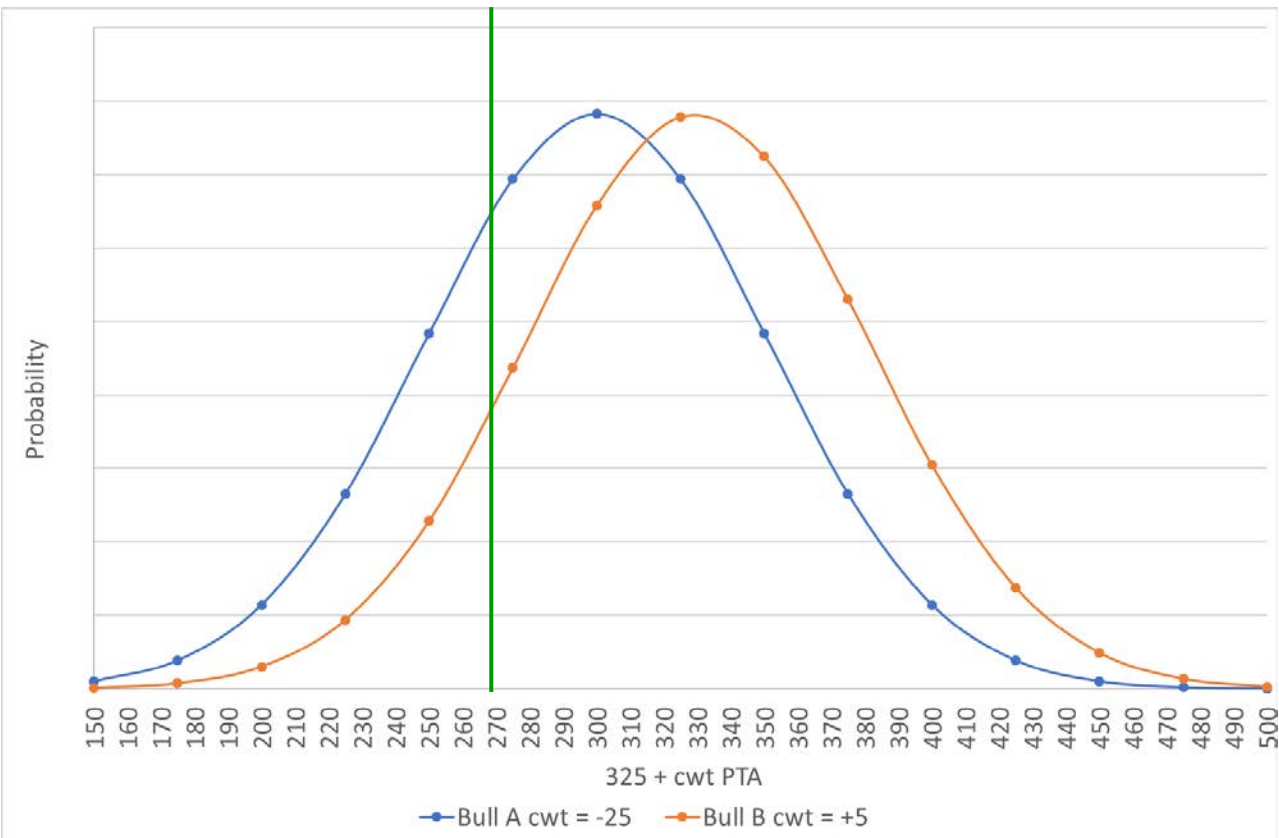
Bull A has CWT = -25

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

Bull B has CWT = +5

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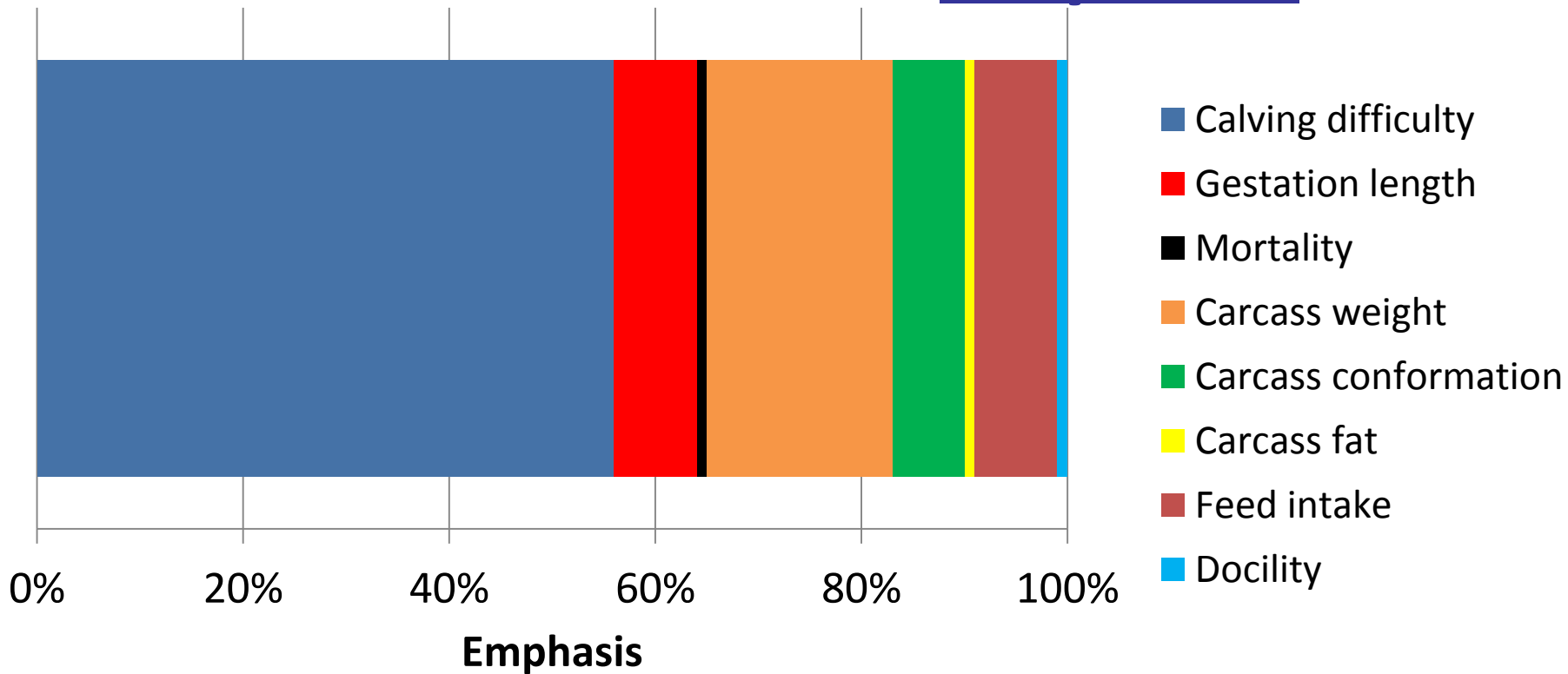- **Penalty of €23**

Out of spec – Angus active sires
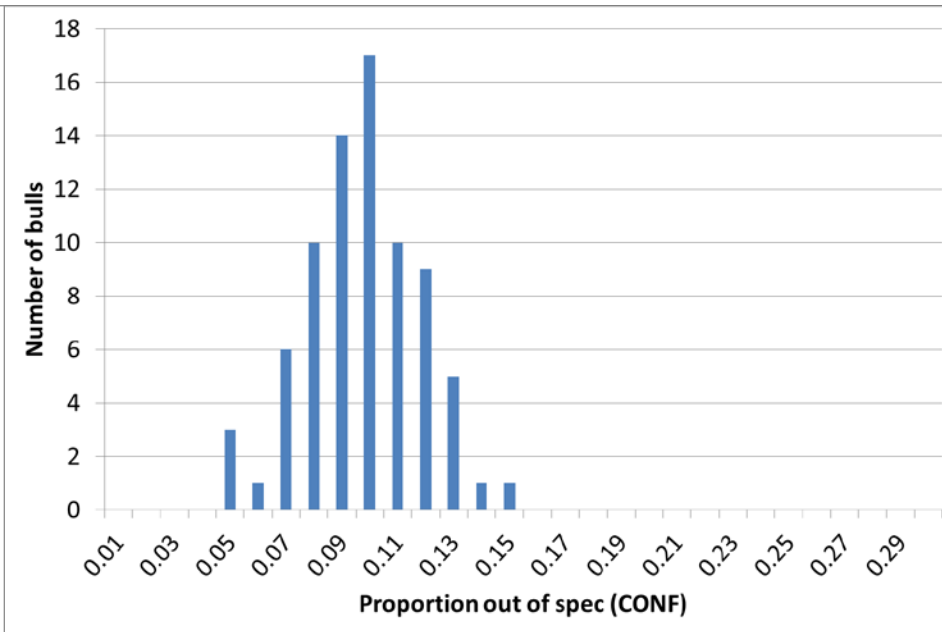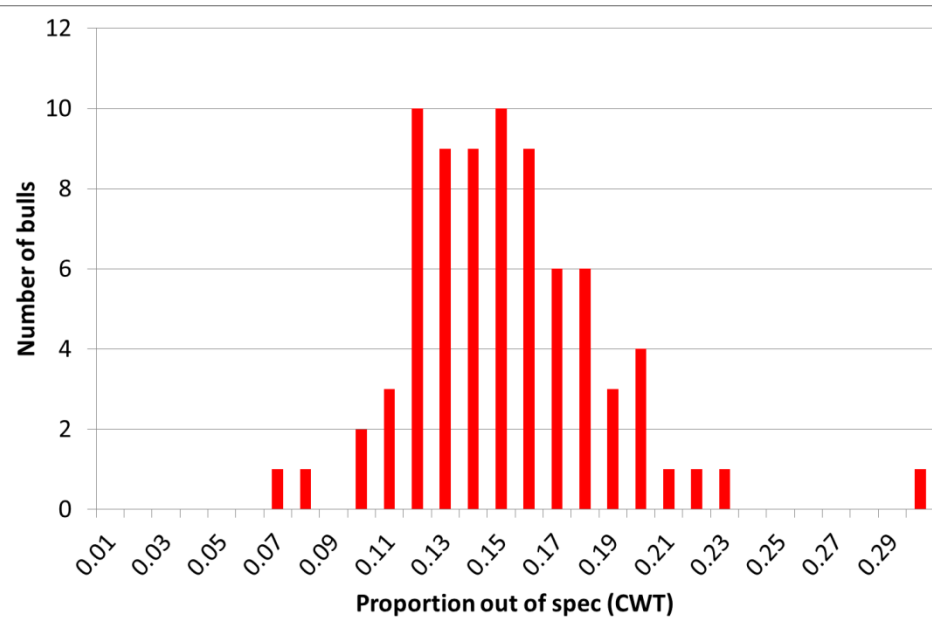
Social traits

- **Docility**
  - **Risk of injury**
  - **Risk of death**
- **Polled**
  - **Cost of polling**
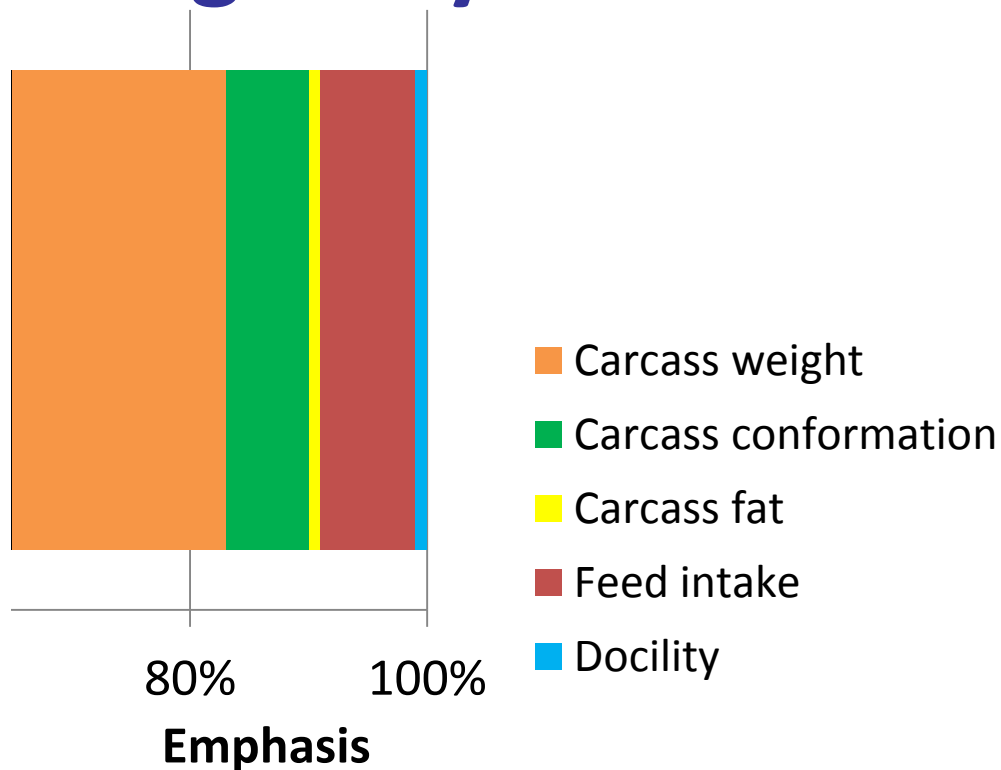
Combined index - _Proposed_

Legend:
- Calving difficulty
- Gestation length
- Mortality
- Carcass weight
- Carcass conformation
- Carcass fat
- Feed intake
- Docility

Emphasis

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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.**

Legend:
- Carcass weight
- Carcass conformation
- Carcass fat
- Feed intake
- Docility

X-axis: 80%, 100% — **Emphasis**

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**