



Value-creating decision support systems  
– a vehicle for deploying innovation

**Donagh Berry**  
*Teagasc & SRUC*

*Teagasc & SRUC conference, Feb 2021*



macron

BT

BT

macron

SCOTLAND

BT

SCOTLAND

SCOTLAND V ENGLAND  
2015  
Calcutta Cup



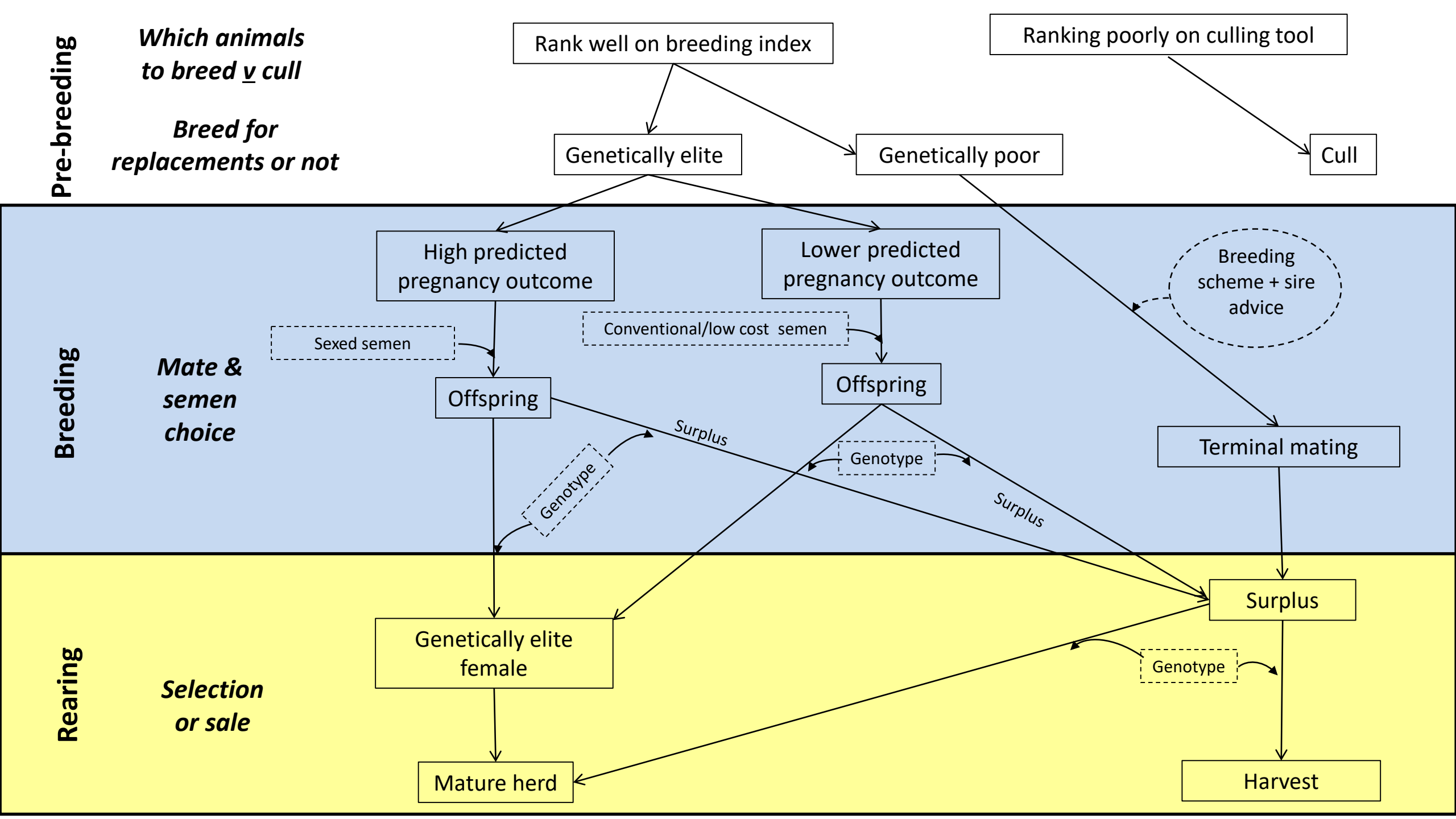
# Potential of breeding



## Selz-Pralle Aftershock 3918



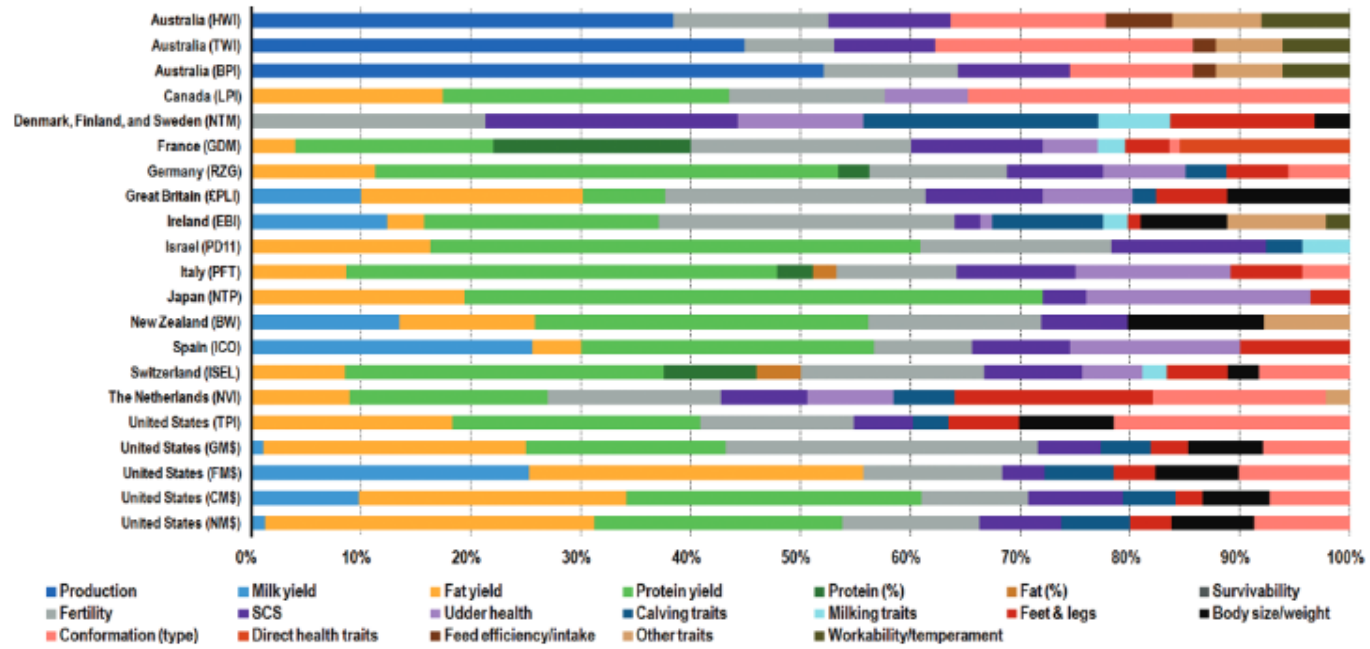
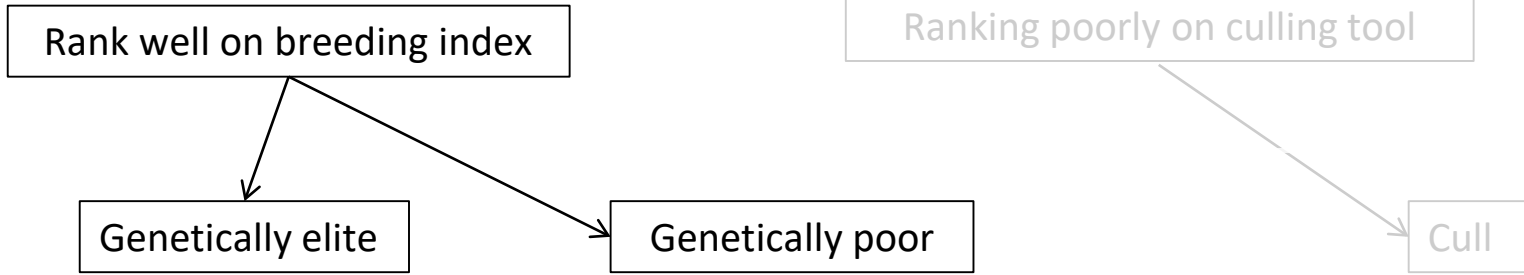
**35,475 kg of milk**  
**1403 kg fat (4.0%)**  
**1085 kg protein (3.1%)**



**Pre-breeding**

*Which animals to breed v cull*

*Breed for replacements or not*



1. Must be important
2. Must exhibit genetic variability
3. Must be measurable or correlated with a measureable trait

- Phenotypes and edits
- Statistical model
- Genomic evaluations
- Relative weights

**Pre-breeding**

*Which animals to breed v cull*

*Breed for replacements or not*

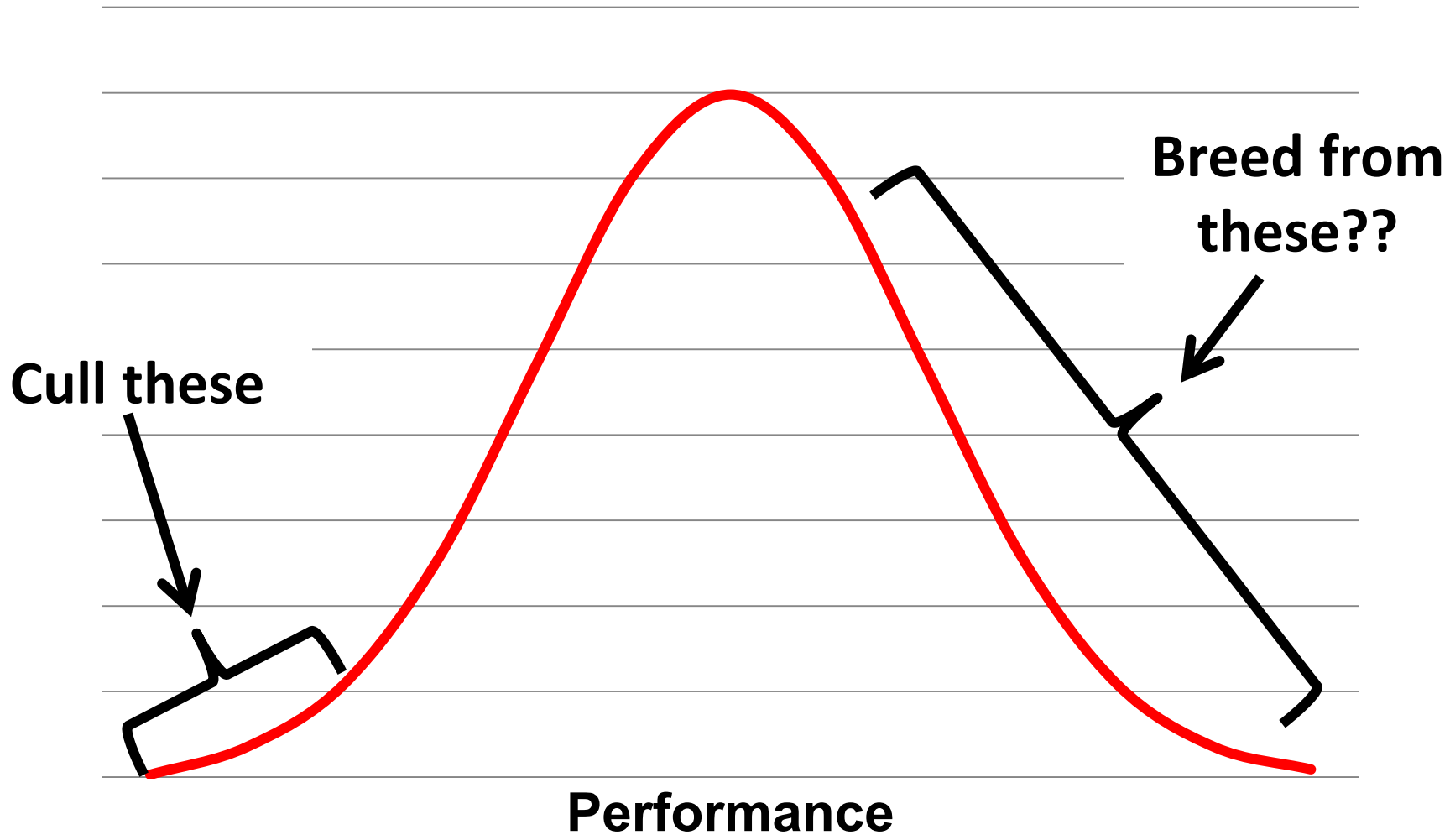
Rank well on breeding index

Ranking poorly on culling tool

Genetically elite

Genetically poor

Cull



Pre-breeding

Which animals to breed v cull

Breed for replacements or not



J. Dairy Sci. 98:4225–4239  
http://dx.doi.org/10.3168/jds.2014-9073  
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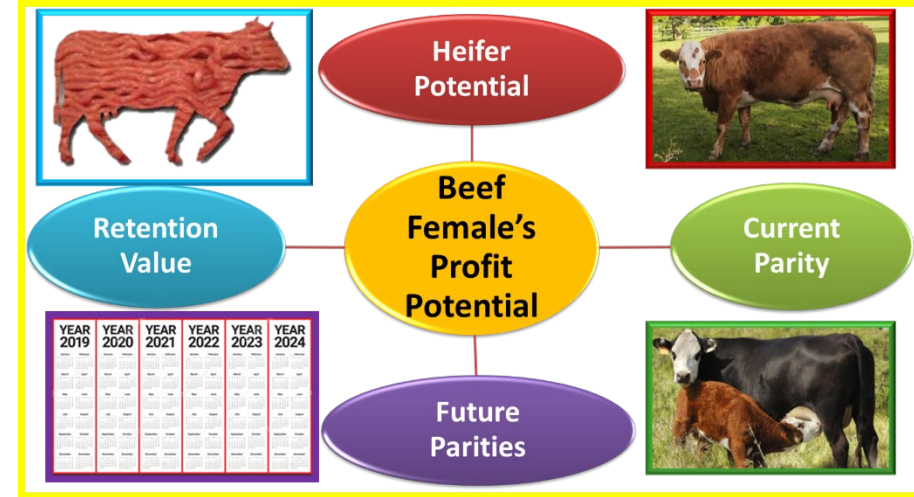
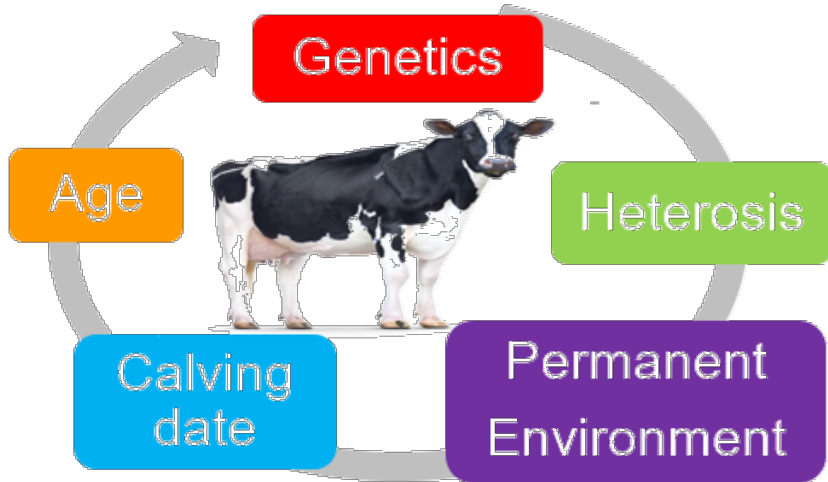
### Development of an index to rank dairy females on expected lifetime profit

M. M. Kelleher,\*† P. R. Amer,‡ L. Shalloo,\* R. D. Evans,§ T. J. Byrne,‡ F. Buckley,\* and D. P. Berry\*<sup>1</sup>

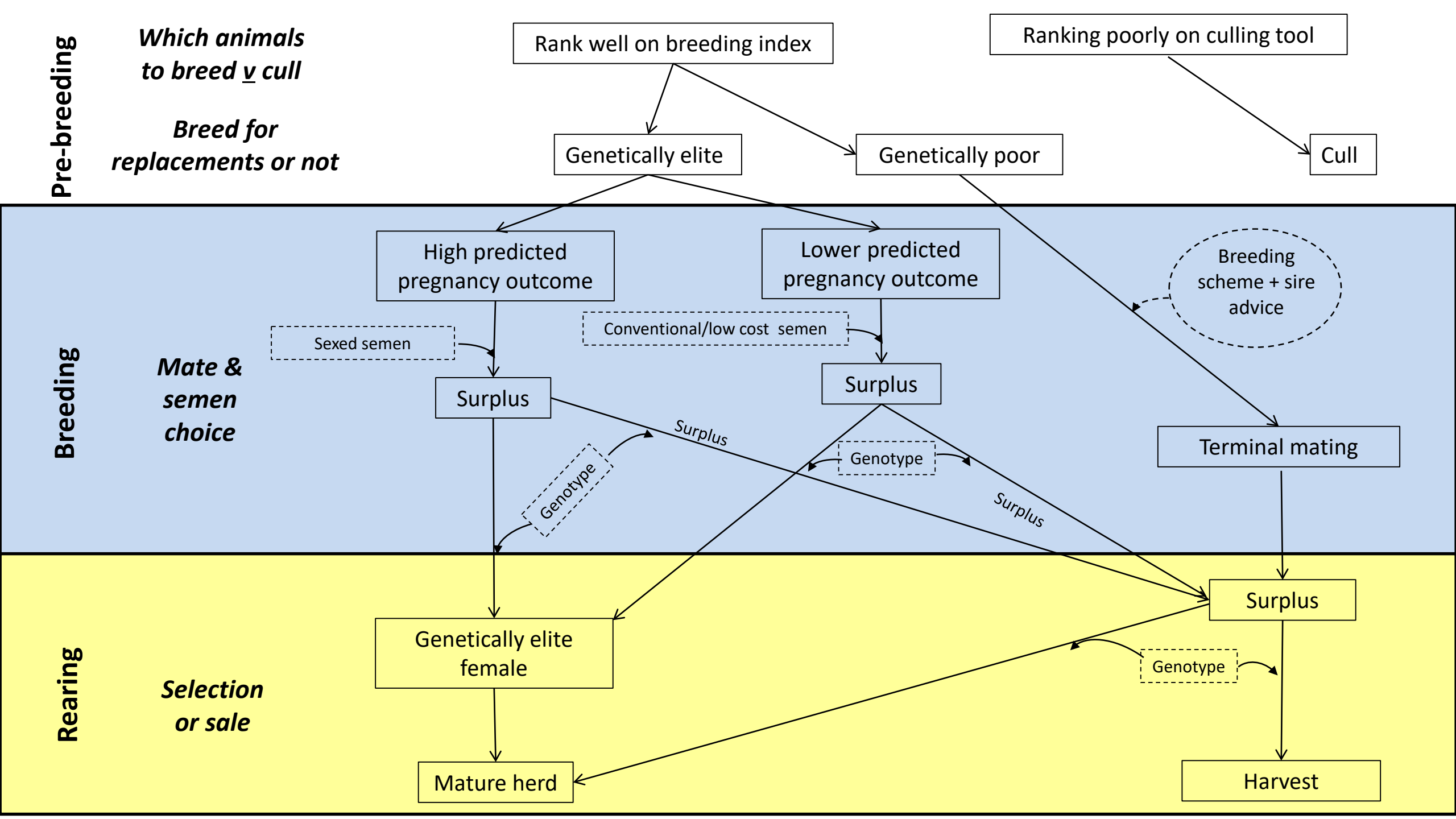
### An index framework founded on the future profit potential of female beef cattle to aid the identification of candidates for culling

F L Dunne, D P Berry ✉, M M Kelleher, R D Evans, S W Walsh, P R Amer

Journal of Animal Science, skaa334, <https://doi.org/10.1093/jas/skaa334>







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to breed vs cull*  
  
*Breed for  
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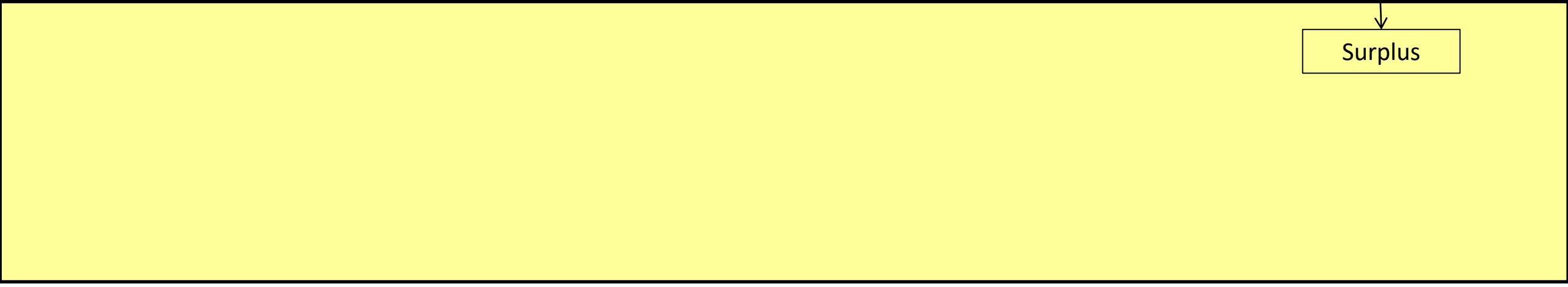
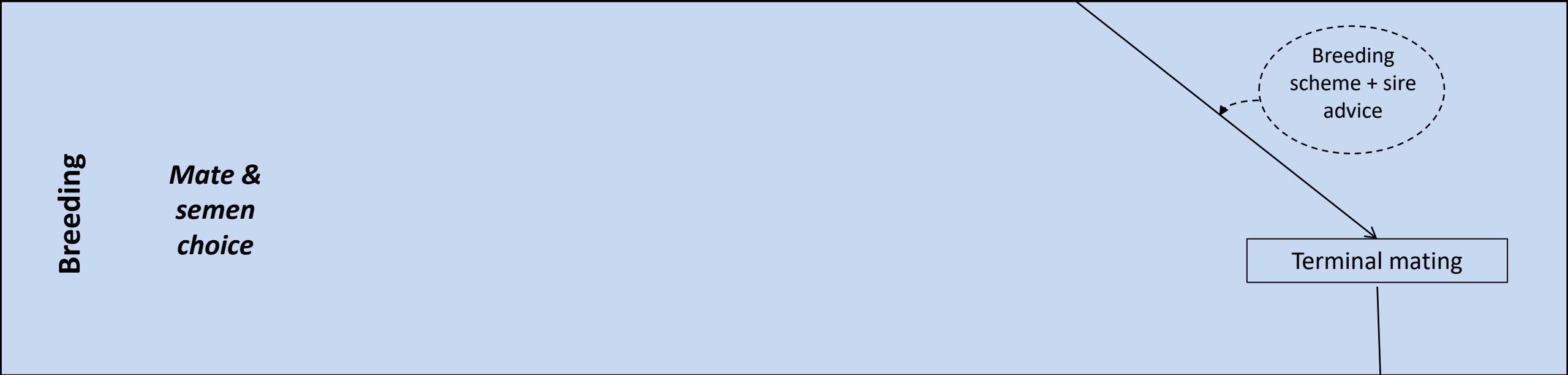
**Breeding**

*Mate &  
semen  
choice*

Breeding  
scheme + sire  
advice

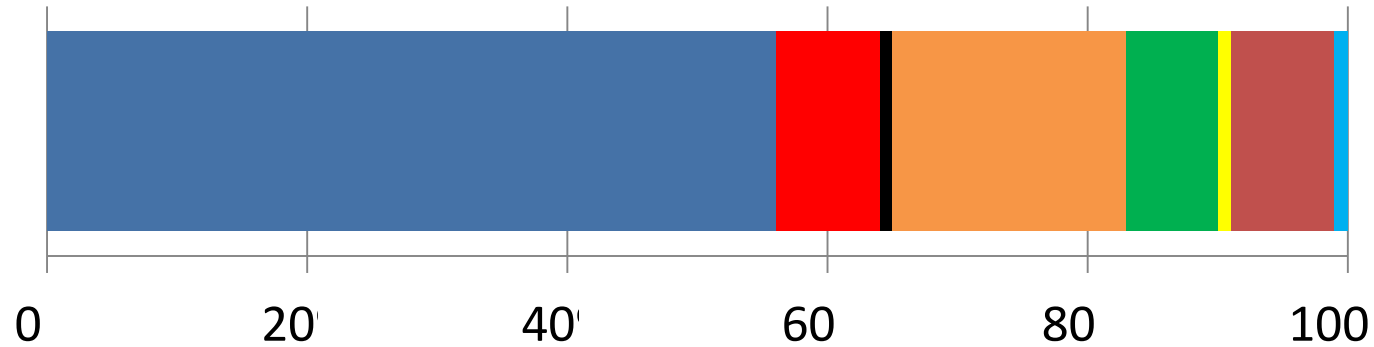
Terminal mating

Surplus

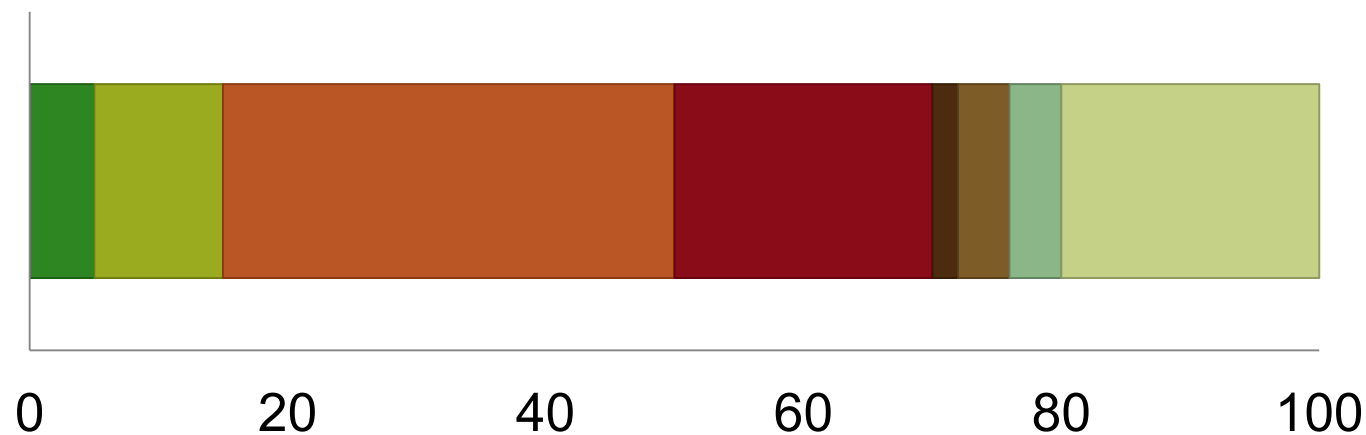


# Terminal indexes – relative emphasis

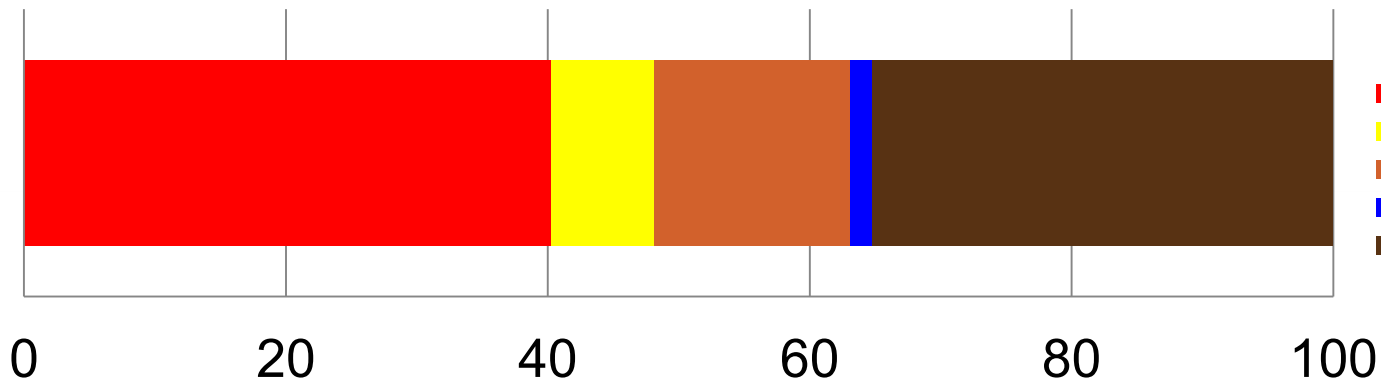
**Beef-on-dairy**



**Beef**



**Sheep**



- Calving difficulty
- Gestation length
- Mortality
- Carcass weight
- Carcass conformation
- Carcass fat
- Feed intake
- Docility
- Carcass fat
- Carcass conformation
- Carcass weight
- Feed Intake
- Docility
- Direct perinatal mortality
- Direct gestation length
- Direct calving difficulty
- Days to Slaughter
- Carcass Conformation
- Carcass fat
- Direct lambing difficulty
- Direct lamb survival

**Pre-breeding**

*Which animal to breed vs cull*

*Breed for replacements or not*

Rank well on breeding index

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**Breeding**

*Mate & semen choice*

High predicted pregnancy outcome

Lower predicted pregnancy outcome

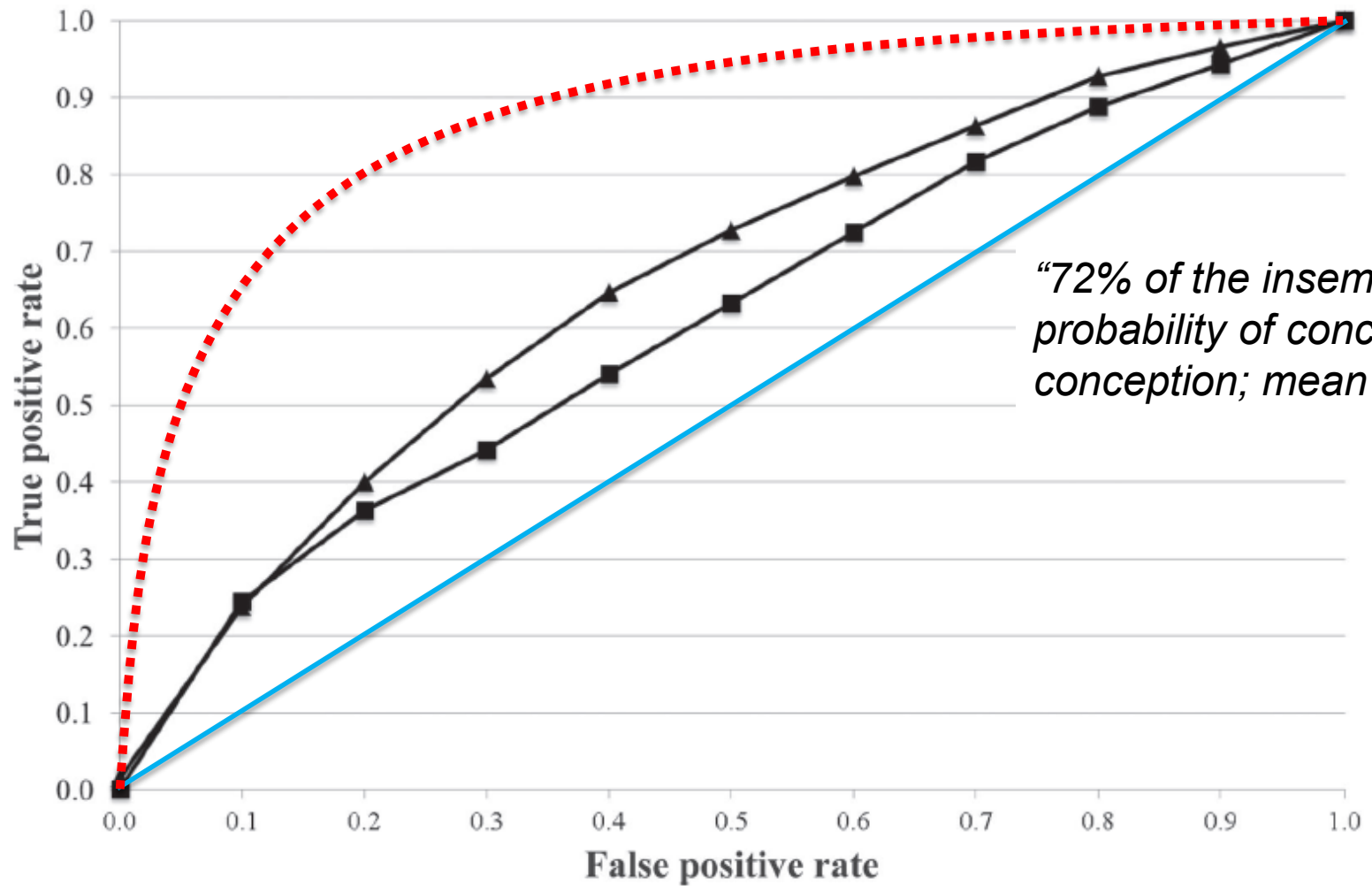
Sexed semen

Conventional/low cost semen

Surplus

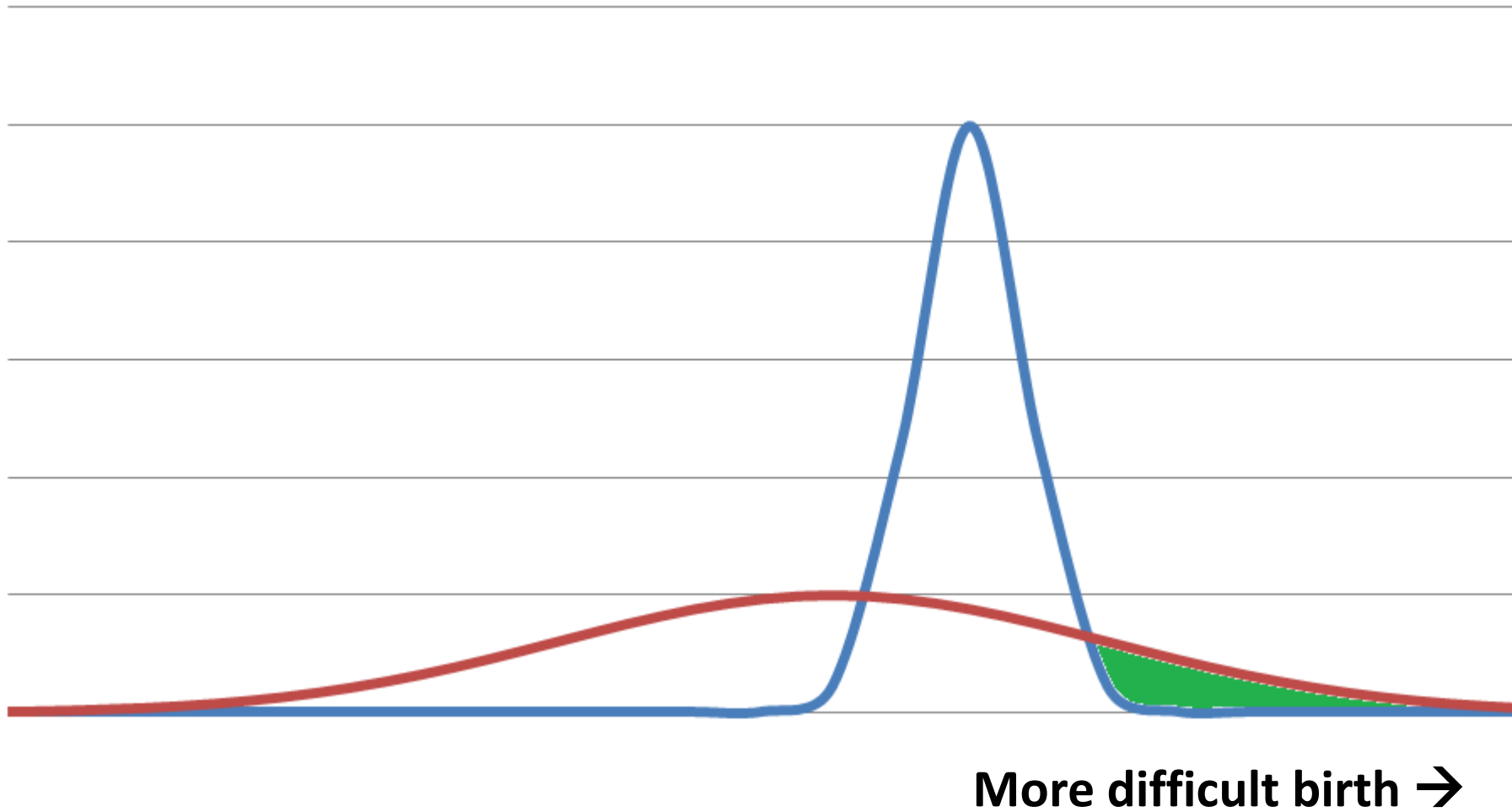
Surplus

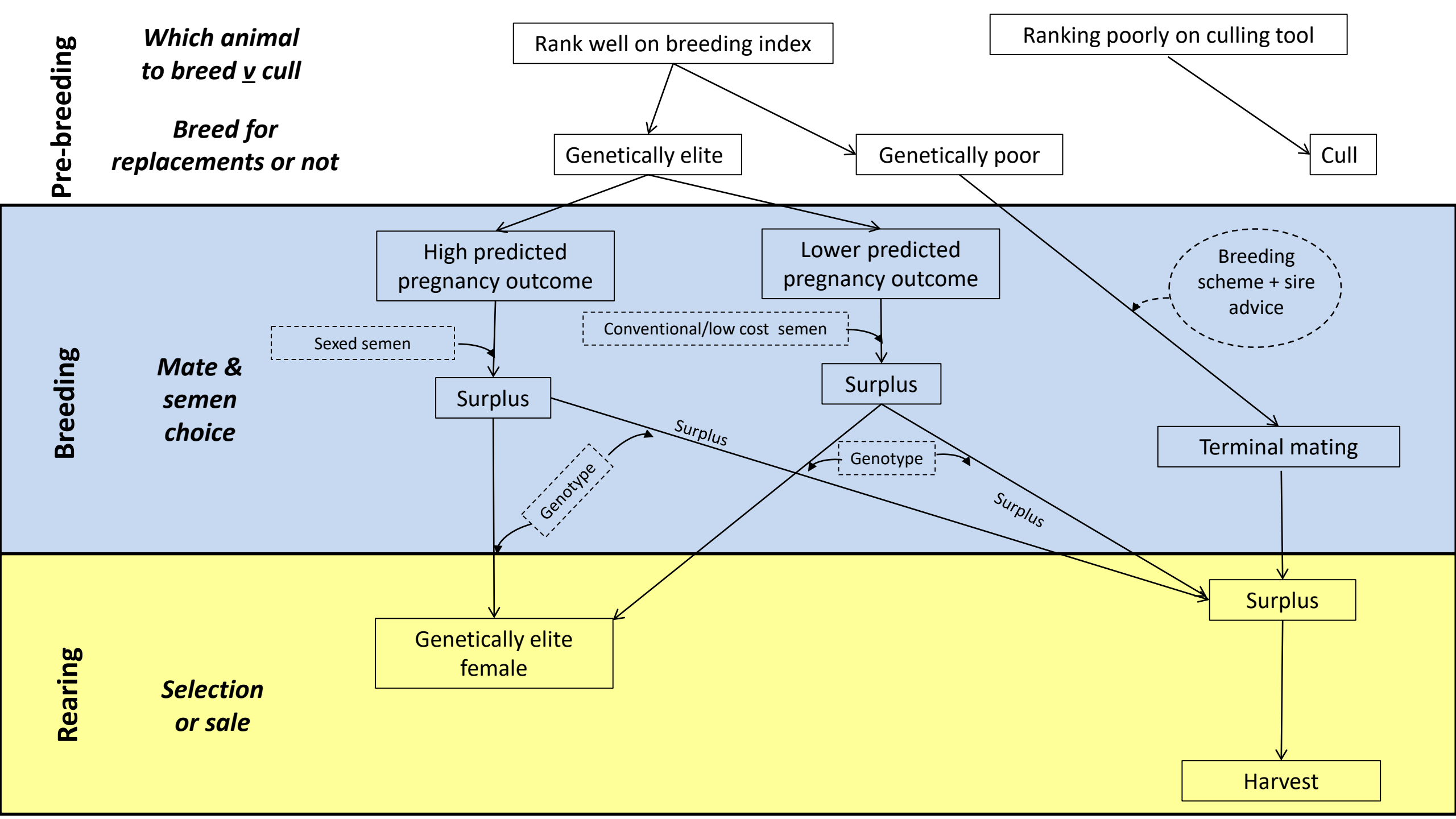
# Can we predict pregnancy??



*“72% of the inseminations in the top 5% of predicted probability of conception success resulted in a successful conception; mean conception rate...was 54.6%.”*  
*Hempstalk et al (2015)*

# Risk management - sire advice





# Female suckler/F1 dairy calves



Formulation of a decision support tool incorporating both genetic and non-genetic effects to rank young growing cattle on expected market value

F.L. Dunne <sup>a,b</sup>, R.D. Evans <sup>c</sup>, M.M. Kelleher <sup>c</sup>, S.W. Walsh <sup>b</sup>, D.P. Berry <sup>a,\*</sup>

An index framework founded on the future profit potential of female beef cattle to aid the identification of candidates for culling

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*Journal of Animal Science*, skaa334, <https://doi.org/10.1093/jas/skaa334>





# Collated

- Calving/lambing dates
- Pregnancy rates
- Nulliparous animals and growth rates
- Young progeny & destiny
  
- Resource allocation budgets
- Daily feed requirements
  - Feed availability



# Decision support tools

- Easy to use & understand
- Real-time & “accurate”
- Joined up
- Modular framework
- Multi-functional
- Species/population agnostic
- Exploits currently available data sources
  - Free-notypes
  - Augmented with additional data
- Single point of the truth
  - SRUC/Eagenes + Teagasc/ICBF