



# Updating the Genetic Evaluation

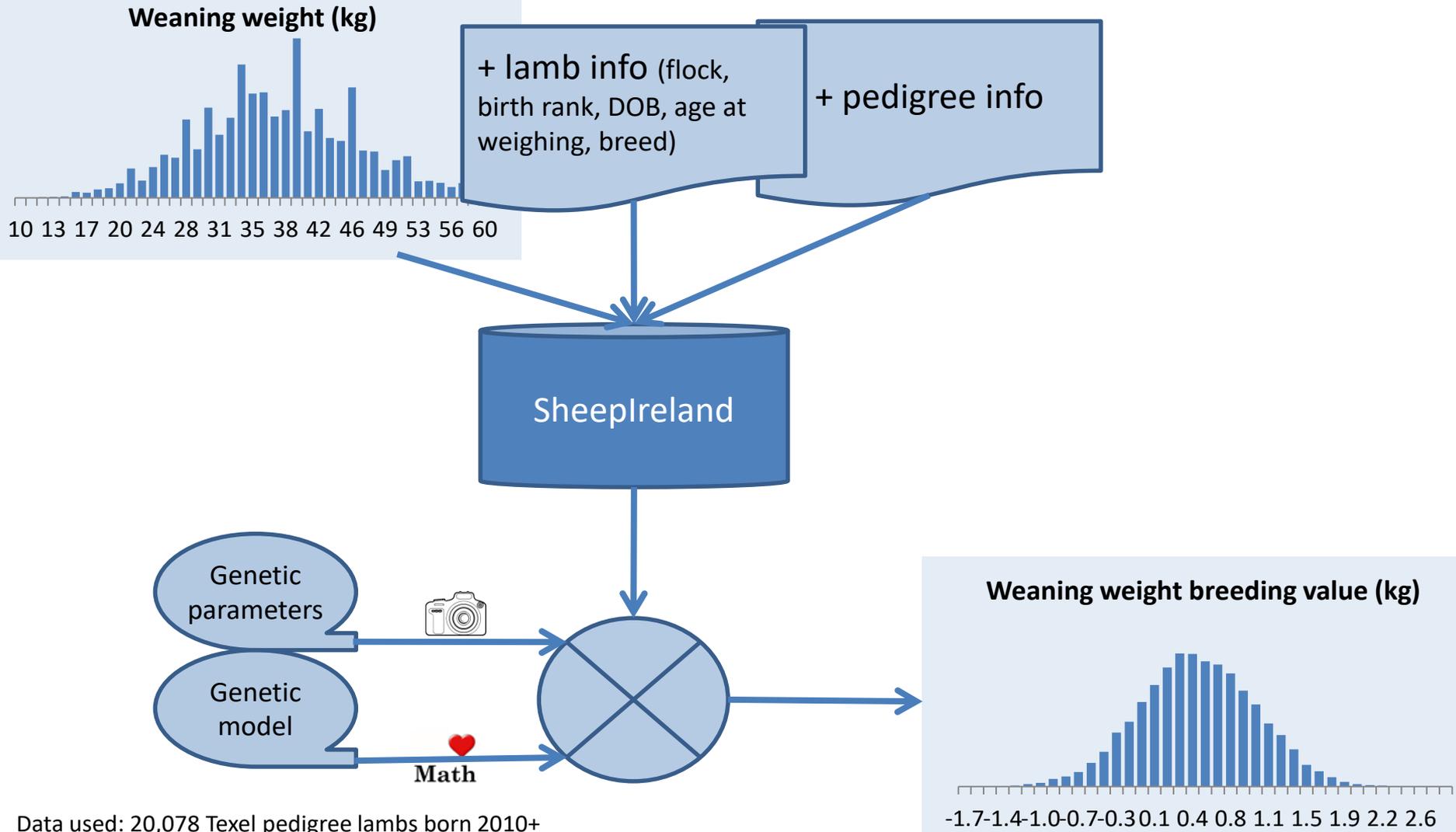


Section	Field	Value
Identification	Animal ID	123456789
	Owner	John Doe
	Address	123 Main St, Dublin
	Phone	01 234 5678
Genetic Data	Breed	White Face
	Sex	Male
	Age	2
	Weight	50kg
Health	Vaccinated	Yes
	Parasiticide	Yes
	Health Score	4.5
	Notes	Good health

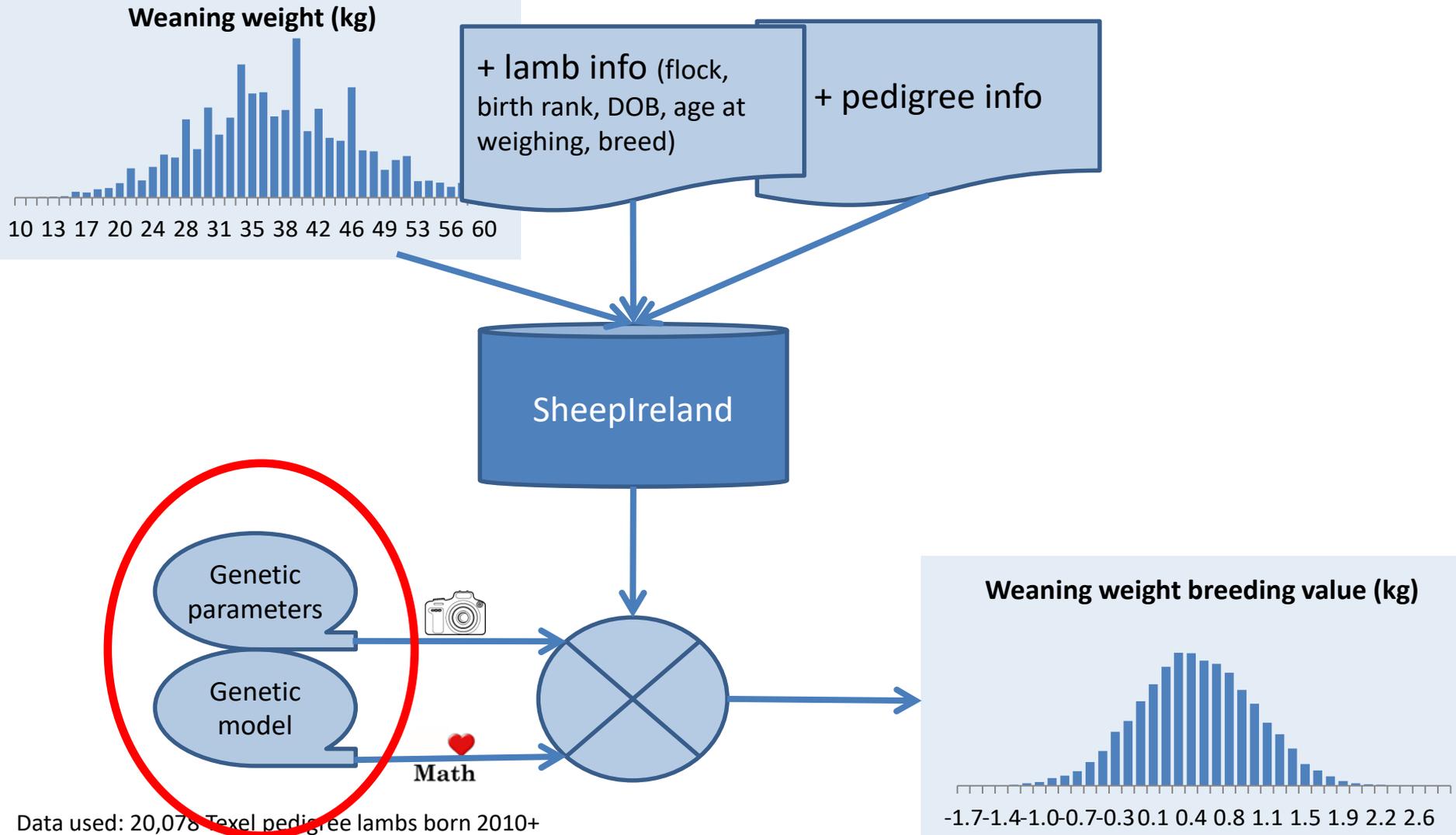


T. Pabiou & SheepIreland team

# Genetic evaluation



# Updating the genetic evaluation

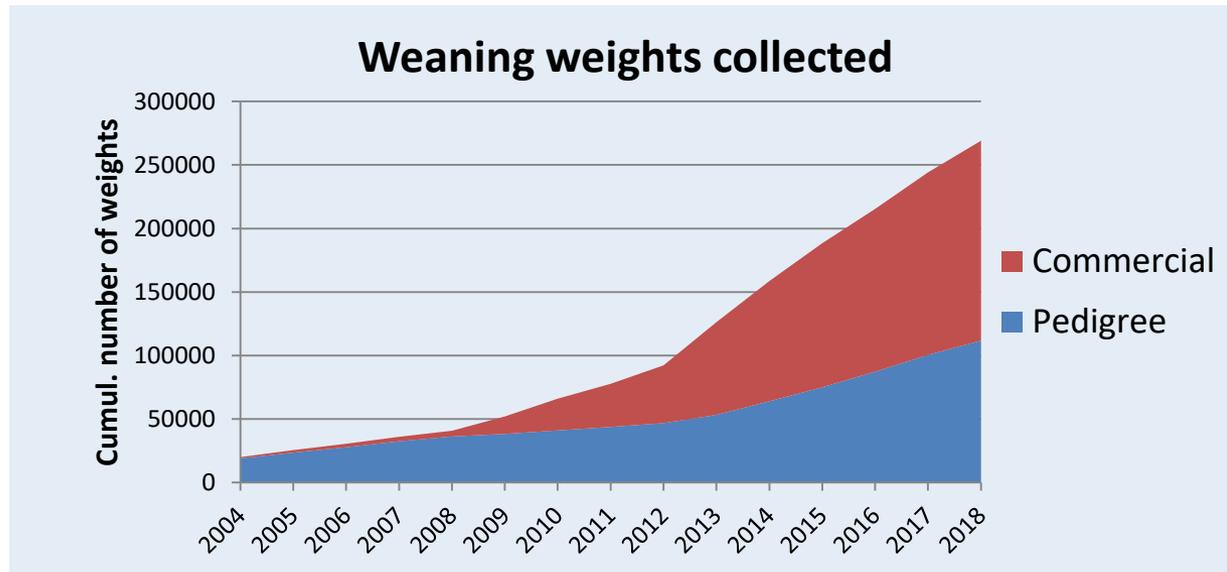


# Why updating genetic evaluations?

- To gain accuracy (1/2)



- By updating the 'genetic parameters'
  - ≥ Snapshot of the population genetic make-up to calculate the **heritability & genetic correlations**
  - ≥ Largely dependent on the records available



# Why updating genetic evaluations?

- To gain accuracy (2/2)
  - Updating the genetic model
    - By using new traits
    - Example: Days To Slaughter

Math

Current



Age at 150 days



Prediction

	Replacement (€0.64)	Terminal (€1.02)
	Acc 38% Rank Top 18%	Acc 40% Rank Top 12%
	★★★★★	★★★★★
Lamb Survivability (0.64%)	Poor 0%	Top 26% V Excellent 100% Acc 40.6%
<b>Days to Slaughter -5.55 days</b>	0%	<b>Top 26% V</b> 100% Acc 48%
No. of Lambs Born (€-0.08)	0%	Top 44% V 100% Acc 33%
Daughters Milk (€1.09)	0%	Top 18% V 100% Acc 36%

New



Age at slaughter



	Replacement (€0.64)	Terminal (€1.02)
	Acc 38% Rank Top 18%	Acc 40% Rank Top 12%
	★★★★★	★★★★★
Lamb Survivability (0.64%)	Poor 0%	Top 26% V Excellent 100% Acc 40.6%
<b>Days to Slaughter -5.55 days</b>	0%	<b>Top 26% V</b> 100% Acc 48%
No. of Lambs Born (€-0.08)	0%	Top 44% V 100% Acc 33%
Daughters Milk (€1.09)	0%	Top 18% V 100% Acc 36%



# 2019 Production module update

- Production module =
  - Live weights
  - Scan for muscle & fat
- Update =
  - Estimation of new genetic parameters
  - Using slaughter data

# New genetic parameters

- Main heritability change

- ≥ Heritability = proportion of phenotypic variance explained by the genetic make-up



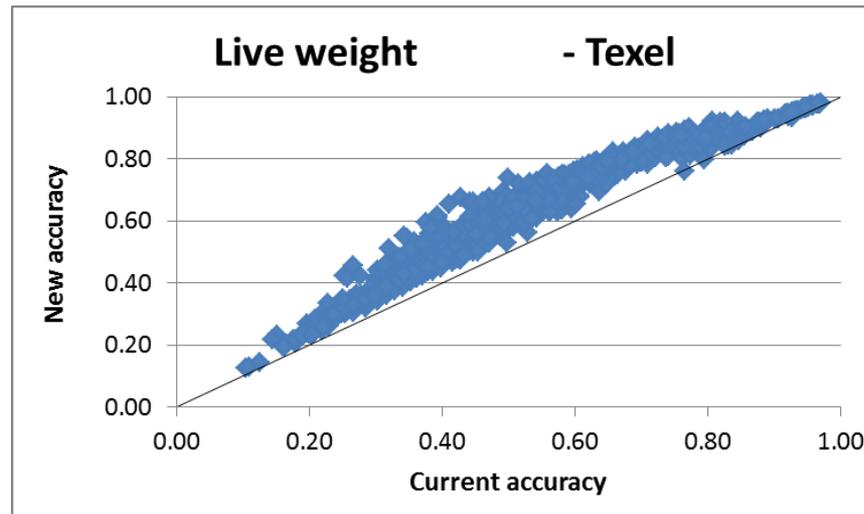
Heritability estimates	Ram effect (direct)		Ewe effect (maternal)	
	Current	<b>New</b>	Current	<b>New</b>
Live weight @ 40day (kg)	25%	<b>23%</b>	10%	<b>15%</b>
Live weight @ weaning (kg)	25%	<b>23%</b>	10%	<b>14%</b>
Live weight @ 150 days(kg)	20%	<b>32%</b>	12%	<b>10%</b>
Muscle scan (mm)	16%	<b>31%</b>	-	<b>4%</b>
Fat depth (mm)	11%	<b>29%</b>		<b>10%</b>
Ewe mature weight	15%	<b>20%</b>	-	-

- Higher heritability = increase accuracy

# Increase in accuracy

- Example: live weight at 150 days

Average accuracy increase across 2,742 active rams\*: **+10%**



Min. increase = +0%

Max. increase = +21%

\*Active ram = ram with progenies in last 3 years

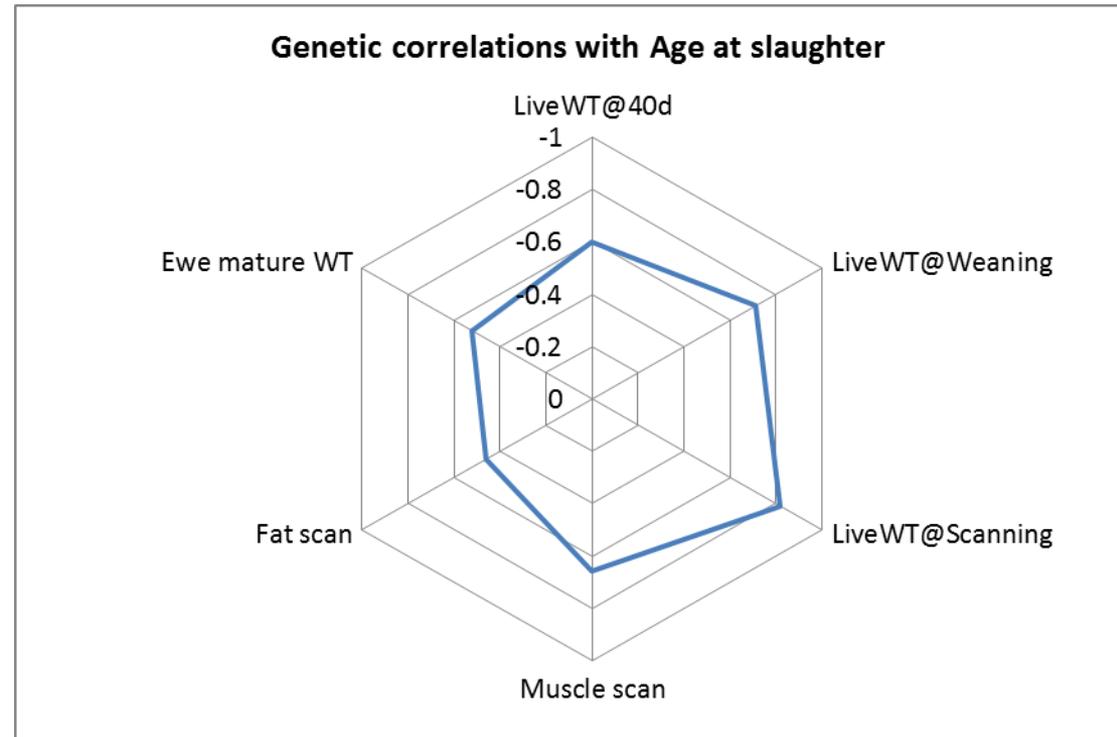
# Using Slaughter data

- Age at slaughter phenotypes
  - 3,504 records
  - Collected from CPT farms 2016 ↔ 2018
  - Pre-adjusted to 21kg carcass weight



# Genetics of age at slaughter

- Heritability
  - direct 25% maternal 7%
- Association with other traits



Ex: correlation LiveWT@Weaning with Age at slaughter = -0.71: the heavier the lamb at weaning, the quicker it'll go to slaughter

# Validation

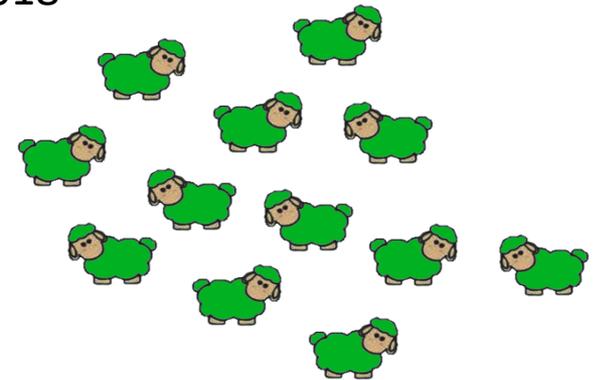
- To check the increase in genetic gain
- By comparing phenotypes of lambs against their parent average

Parent average

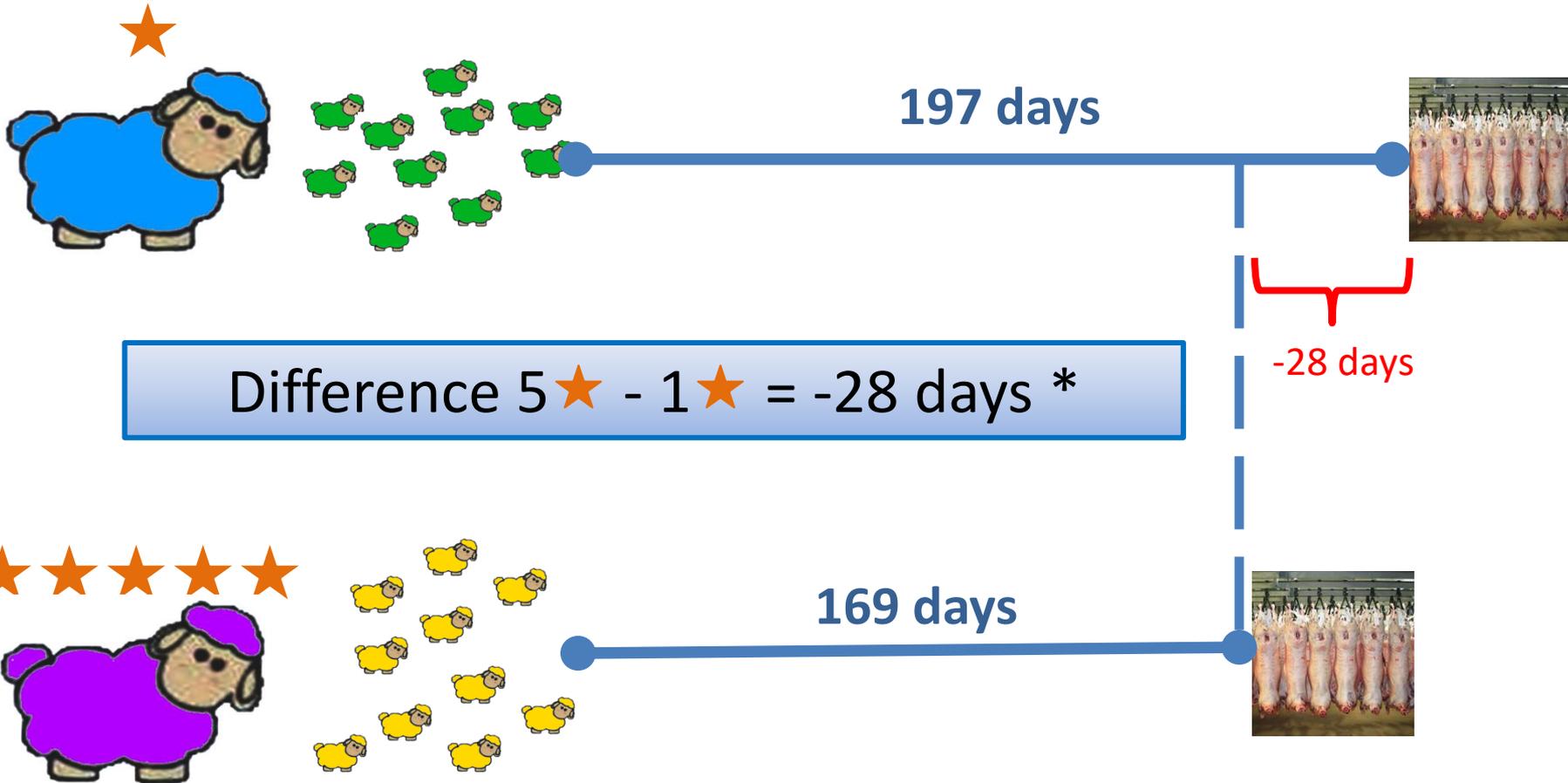


<b>EuroStars</b>		20/10/2016
Replacement (€0.63)	Terminal (€0.91)	
Acc 42% Rank Top 41%	Acc 43% Rank Top 11%	
★★★★	★★★★★★	

Phenotypes recorded 2017 & 2018



# Age at slaughter by ★



\*Bootstrap 2000 samples x 6000 animals: S.D. = 12.3 days

# Conclusion

- Current genetic evaluation has 4 modules
  - Production, Lambing, Litter size, Health
  - 2 / 4 have been updated recently
- Production module can be updated for 2019
  - Better accuracy
- Litter size module research started