Meat yield genetic evaluations
Meat Technology Ireland

- 5 year research & innovation programme
  - Developed by industry and co-funded by Enterprise Ireland and beef and sheep meat processing companies
- 6 strategic research pillars
  - Genomic predictions
  - Meat tenderness
  - Meat safety
  - Meat characterisation technologies
  - Meat and health
  - Market opportunities
Background

- Payment systems in factories based on estimates of carcass value
  - Many national genetic evaluations for carcass merit are based on such metrics (Pabiou et al., 2012)
  - Conroy et al. (2010) reported a correlation of 0.85 between this classification system and carcass meat proportion
- Due to the large resource demand to generate detailed cut data, few have embarked on this research
Breeding for primal cuts?

~200,000 animals
Breeding for primal cuts?

Heritability

Propotion of the variation on an individual due to genetics

60% of the variation in carcass weight is due to genetics!

<table>
<thead>
<tr>
<th>Trait</th>
<th>Heritability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carcass weight</td>
<td>0.62</td>
</tr>
<tr>
<td>Carcass fat score</td>
<td>0.56</td>
</tr>
<tr>
<td>Carcass conformation score</td>
<td>0.78</td>
</tr>
</tbody>
</table>
Heritability of retail cuts

Heritability vs Trait

- Topside
- SS flat
- Eye of round
- Knuckle
- Rump
- Striploin
- Fillet
- Cuberoll
- Bavette
- Brisket
- Chuck tender
- LMC
- Chuck and neck
- Heel Shank
- Frying
- Roast
- Mince

Milk yield
Breeding for primal cuts?

- Heritability of primal cuts ✓
- Variation present in the dataset ✓

Can we predict primal cut weight using genetics?

- Using primal cuts of ~200,000 animals
  - Stratify young animals into groups based on their **genetic merit** for the weight of primal cuts
  - Compare the predicted performance of animals with their actual data at slaughter
### Predicted performance versus actual performance

<table>
<thead>
<tr>
<th>Stratum</th>
<th>Rump</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very light</td>
<td>12.79</td>
</tr>
<tr>
<td>Light</td>
<td>13.36</td>
</tr>
<tr>
<td>Heavy</td>
<td>13.79</td>
</tr>
<tr>
<td>Very heavy</td>
<td>14.07</td>
</tr>
</tbody>
</table>

10%
## Predicted performance versus actual performance

<table>
<thead>
<tr>
<th>Stratum</th>
<th>Rump</th>
<th>Striploin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very light</td>
<td>12.79</td>
<td>13.28</td>
</tr>
<tr>
<td>Light</td>
<td>13.36</td>
<td>13.89</td>
</tr>
<tr>
<td>Heavy</td>
<td>13.79</td>
<td>14.53</td>
</tr>
<tr>
<td>Very heavy</td>
<td>14.07</td>
<td>14.87</td>
</tr>
</tbody>
</table>

10% difference for Light, 12% difference for Very heavy.
Predicted performance versus actual performance

<table>
<thead>
<tr>
<th>Stratum</th>
<th>Rump</th>
<th>Striploin</th>
<th>Fillet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very light</td>
<td>12.79</td>
<td>13.28</td>
<td>6.12</td>
</tr>
<tr>
<td>Light</td>
<td>13.36</td>
<td>13.89</td>
<td>6.32</td>
</tr>
<tr>
<td>Heavy</td>
<td>13.79</td>
<td>14.53</td>
<td>6.46</td>
</tr>
<tr>
<td>Very heavy</td>
<td>14.07</td>
<td>14.87</td>
<td>6.56</td>
</tr>
</tbody>
</table>
To conclude...

• Genetic *variability* in the weight of primal cuts exists
• Ability to increase *primal cut weight* without altering carcass weight
• Parental average measures of genetic merit can *stratify carcasses* on primal cut yields
Thank You