Defining consensus genetic gains for the Kenya Holstein-Friesian breeding objective

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Kenya dairy cattle sector

- Mostly based on the Holstein-Friesian crosses

- Diverse production and marketing systems
  - Largescale producers → processors
  - Smallholder producers → informal market

- Dependencies between the production systems
  - Heifers/ semen from largescale to smallholder farms
Kenya dairy cattle sector

- Genetic improvement - semen importation

- GxE present
  - Genotype – production environment mismatch

- Minimal pedigree and performance recording
Aim

- Breeding goal for the Kenya Holstein-Friesian
- Diversity -> Consensus desired gains

Step 1 • Individual preferences

Step 2 • Group preferences

Step 3 • Consensus preferences
Materials and methods

a. Data collection

- Data collected using a field survey. 78 respondents
  - Smallholder farmers
  - Large scale farmers
  - Processors
Materials and methods

b. Traits in the breeding goal

- Determined through a preliminary survey
- Picked 5 highest ranked traits from a list of 19
- Were: milk yield (MY), production life time (PLT), calving interval (CI), fat yield (FY) and mature body weight (MBW)
Materials and methods

c. Individual preferences

• Trait importance -> pair-wise comparisons
  • Saaty’s scale of intensity of importance

<table>
<thead>
<tr>
<th>10.6% increase in MY</th>
<th>Equal</th>
<th>1.3% decrease in CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 8 7 6 5 4 3 2 1</td>
<td>2 3 4 5 6 7 8 9</td>
<td></td>
</tr>
</tbody>
</table>

• Analytic Hierarchy Process (AHP) -> Individual Preferences
  • Ratio scales
Materials and methods

d. Social groups

- **Producers**
  - **Group A**: Large scale and smallholder
    - Land size, no. of cows, machinery
  - **Group B**: Imported and local
    - Semen source imported/ local
  - **Group C**: <10, 10-15 and >15 kg
    - Milk yield per cow per day
  - **Group D**: ≤5 kg and >5 kg
    - Concentrates per cow per day

- **Processors**
Materials and methods

e. Social preferences

- Criterion: Weighted goal programming (WGP) (Linares and Romero, 2002)
- Preferences: Minimizing disagreements between individual preferences
Materials and methods

f. Consensus preferences and desired gains

- ConP were based on WGP
  - Compromise between minimizing disagreements and maximizing average agreements

- DG = ConP x genetic gains (% mean)
Results

a. Individual preferences

Median and quantiles for individual preferences
Results

b. Social preferences
## Results

c. Social preferences and desired gains

<table>
<thead>
<tr>
<th>Trait</th>
<th>PLT</th>
<th>MY</th>
<th>CI</th>
<th>FY</th>
<th>MBW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pref</td>
<td>0.25</td>
<td>0.23</td>
<td>0.17</td>
<td>0.14</td>
<td>0.05</td>
</tr>
<tr>
<td>G%</td>
<td>10.1%</td>
<td>10.6%</td>
<td>1.3%</td>
<td>6.4%</td>
<td>3.1%</td>
</tr>
<tr>
<td>desiredG%</td>
<td>2.51%</td>
<td>2.42%</td>
<td>0.22%</td>
<td>0.87%</td>
<td>0.15%</td>
</tr>
</tbody>
</table>
Conclusions

- Differences in preferences given to traits exist between social groups

- Classification of producers should be based on level of intensification
  - Low intensity producers
  - High intensity producers

- Single breeding goal for diverse production systems?
  - Desired gains based on consensus preferences
Thank you!

Questions?