

# ***SELECTION INDEX***

## **POSSIBILITIES, PITFALLS, AND POTENTIAL CHANGES**

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# Selection Index

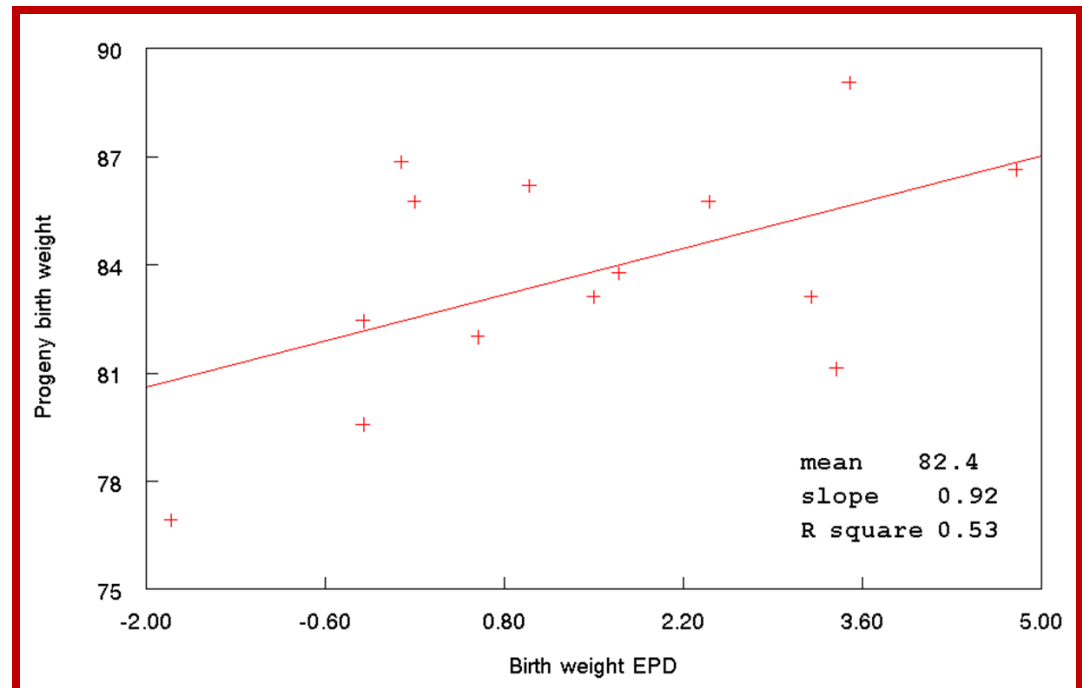
- $I = \sum v_i EPD_i$ 
  - Decompose problem into two parts: prediction of EPD and estimation of economic values
- Where,  $v_i = \frac{\partial profit}{\partial phenotype_i}$
- Assuming,  $\Delta EPD_i = \Delta phenotype_i$

# Selection Index

- $I = \sum v_i EPD_i$
- Where,  $v_i = \frac{\partial profit}{\partial phenotype_i}$ 
  - Analytical direct solution
  - Approximation by method of finite differences
  - Linear programming
- Assuming,  $\Delta EPD_i = \Delta phenotype_i$

# Selection Index

- $I = \sum v_i EPD_i$
- Where,  $v_i = \frac{\partial profit}{\partial phenotype_i}$
- Assuming,  $\Delta EPD_i = \Delta phenotype_i$



# Possibilities

- Use genetic selection to improve economic merit
- Maximize present value of genetic improvement
- Consistent implementation of selection criteria
- Use complete set of economically relevant traits

# Pitfalls

- Temptation to think selection can overcome advantages of heterosis
- Incomplete indexes
  - Ignore genetic antagonisms
  - Fail to address full production cycle
  - Don't give some traits the attention they are due
- Poor estimates of genetic parameters
  - → poor estimates of EPD

# Potential Changes

- Incorporate additional traits
  - Update genetic evaluation systems
    - Improved estimates of variance components
    - More appropriate models
  - Make indexes more complete
- Make genetic evaluation of ERT more accurate
  - Incorporate genomic predictors / better relationships
- Enhance econometrics
- Increase ease of developing customized indexes