SELECTION INDICES

Problems

3-1. Calculate a selection index for poultry layers, using the information of a hen and its mother. Mean= 300 eggs, CV=0.15, h^2=0.1

3-2. Calculate a selection index for milk production and percentage of protein in milk. Milk: Average 9,000 kg, CV= 0.15, h^2=0.4. The increase of 1kg of milk produces a profit of €0.3. Protein: Mean 3%, CV=0.05, h^2=0.5. The increase of 0.1% protein produces a profit of €0.3 per kg of milk. $r_g = -0.5,\ r_P = -0.25$

3-3. Calculate a selection index for two genetically and phenotypically uncorrelated traits, with economic weights 2 and 1, and heritabilities 0.1 and 0.4, respectively.

Self-assessment questions (True or False)

1. The amount of milk and the percentage of protein in the milk are negatively correlated. A selection index for these traits should improve both.
2. The variance of a selection index is smaller the more family information is available to build the index.
3. The residual variance is smaller the more family information is available to build the index.
4. Indices with family information are useful especially when the heritability of the trait is low.
5. Selection indices for several traits are constructed by weighing the observed values with economic weights.
6. Selection indices for several traits take into account the genetic and phenotypic relationships between traits.
7. There can be traits in an index that selected but not recorded, and traits that are recorded but not selected.
8. If you want a trait to remain unchanged, you can build a selection index with restrictions on that trait.
9. It is recommended to use selection indices for the largest number of traits possible, in order to maximize the benefit.
10. Selection indices are robust to the errors made when calculating the economic weights; the response to the selection that is obtained is similar although the economic weights are not calculated exactly.