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Effect of Nordic Total Merit Indices

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Total Merit Indices (TMIs) in the Nordic countries are basically similar, but the economic weights given to different traits are not identical. It means the genetic response by selecting for the Finnish, Danish or Swedish TMI will be somewhat different.

In table 1 and 2 is the Total Merit Indices (TMI) in Denmark, Sweden and Finland compared. The effect of the different TMIs is expressed as the correlation between the different indices and the TMI index for AI bulls born in a 3 year period 1997-1999. The correlations x 100 express the response in each trait in percentage of the maximum response given that the particular trait was the only trait in the breeding goal.

In the Nordic Total Merit Indices, considerable weight is put on health and reproduction traits (. By selecting for the Total Merit index within each country for Red breeds, all countries will achieve a genetic progress in mastitis resistance from 22% to 44% of the maximum response given mastitis resistance was the only trait in the breeding goal (Table 1). For comparison, the genetic response in yield traits is 56% to 78% of the maximum response. The corresponding figures for the Holstein show that all countries will achieve a progress in mastitis resistance from 17% to 43% (Table 2) of the maximum response given mastitis resistance was the only trait in the breeding goal. The response in yield traits is 45% to 80% of the maximum response.

The Swedish and Danish TMI give quite similar responses. The Finnish TMI has less weight on udder health, fertility and longevity compared with Denmark and Sweden leading to less positive response in these traits and a higher response in yield traits.

It is well known that the genetic correlations between both yield and fertility and yield and udder health are unfavourable. But by selecting for TMI as defined in the Nordic countries it is possible to get a positive trend for both fertility, udder health and yield traits.

Tabel 1. Correlation between Total Merit Index and EBVs for single traits. Red breeds

Trait	Denmark	Finland	Sweden
Yield index	0.73	0.78	0.56
Beef	0.11	-	0.14
Fertility	0.15	0.05	0.20
Calving ease, direct	0.28	-0.01	0.22
Calving ease, maternal	-0.05	0.04	0.32
Udder health	0.44	0.22	0.34
Other disease	0.32	0.13	0.19
Body	-0.09	0.18	0.15
Feet and Legs	0.05	0.04	0.31
Udder	0.22	0.32	0.36
Longevity	0.45	0.08	0.50
Milkability	0.27	0.10	0.04
Temperament	0.15	0.02	0.06

Tabel 2. Correlation between Total Merit Index and EBVs for single traits. Holstein

Trait	Denmark	Finland	Sweden
Yield index	0.67	0.80	0.45
Beef	0.18	-	-0.02
Fertility	0.18	-0.05	0.40
Calving ease, direct	0.25	0.09	0.37
Calving ease, maternal	0.37	0.12	0.43
Udder health	0.35	0.17	0.43
Other disease	0.37	0.15	0.24
Body	0.13	0.08	-0.01
Feet and Legs	0.14	0.01	0.30
Udder	0.29	0.35	0.30
Longevity	0.36	0.12	0.58
Milkability	0.27	0.24	-0.10
Temperament	0.04	0.08	0.01