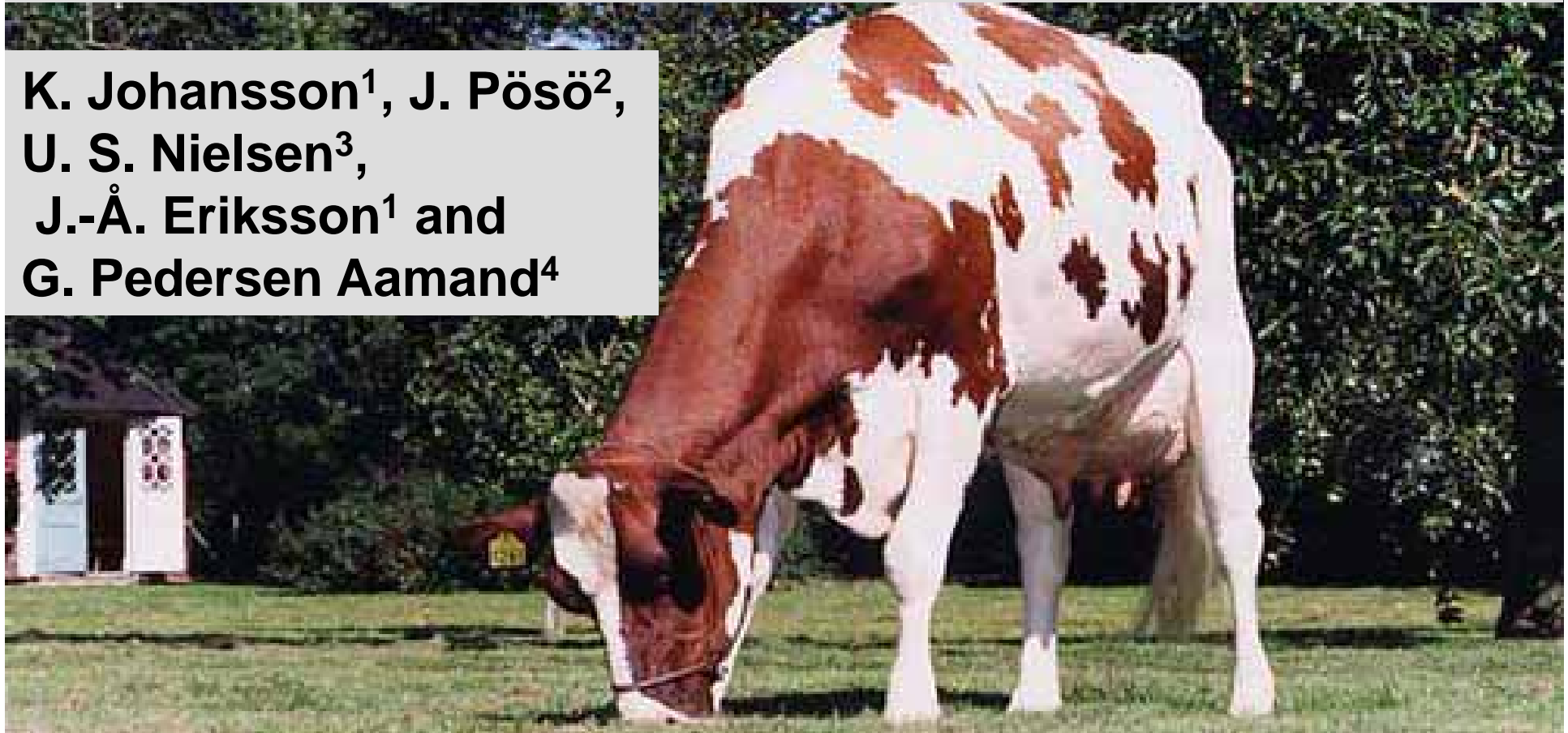


Joint Genetic Evaluation of Other Disease Traits in Denmark, Finland and Sweden

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Other diseases

- **19% have at least one other disease treatment in first lactation**
 - Animal Welfare
 - Economy



Disease traits in current evaluations

Denmark

Reproductive, Metabolic, Feet and legs

Finland

Other diseases

Sweden

Reproductive, Other diseases



More than 300 disease codes

Treatment policy differ between countries
and years



- Large country and year differences in disease incidences



- Harmonisation between countries
- Chose disease codes carefully to maximise heritability
- Correct for heterogeneous variances between countries and years



Four disease traits

Three lactations

- Early reproductive diseases **ERP**
(0-40 DIM)
- Late reproductive diseases **LRP**
(41-305 DIM)
- Metabolic diseases **MB**
(-15-305 DIM)
- Feet and legs diseases **FL**
(-15-305 DIM)

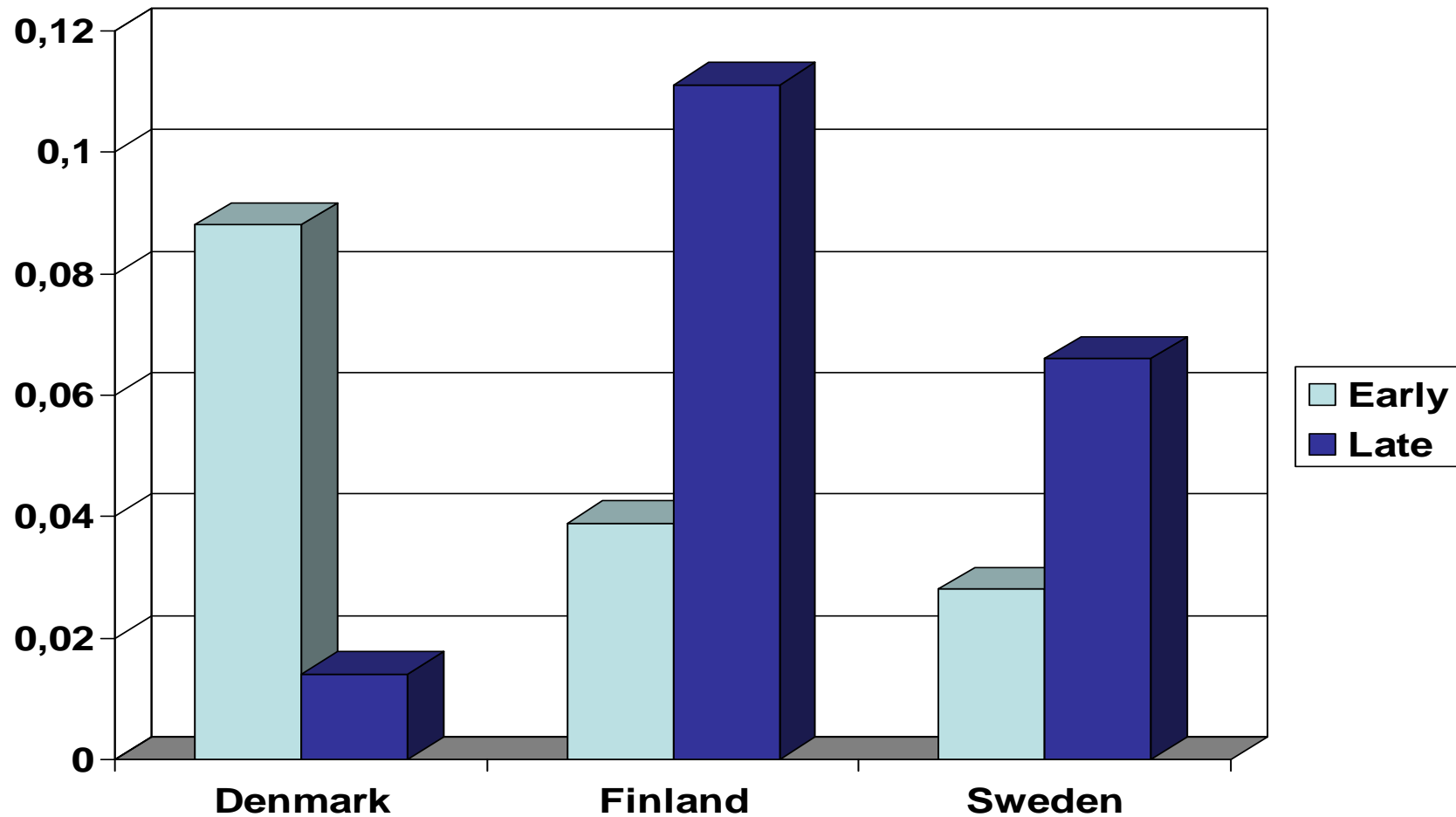


Four disease traits

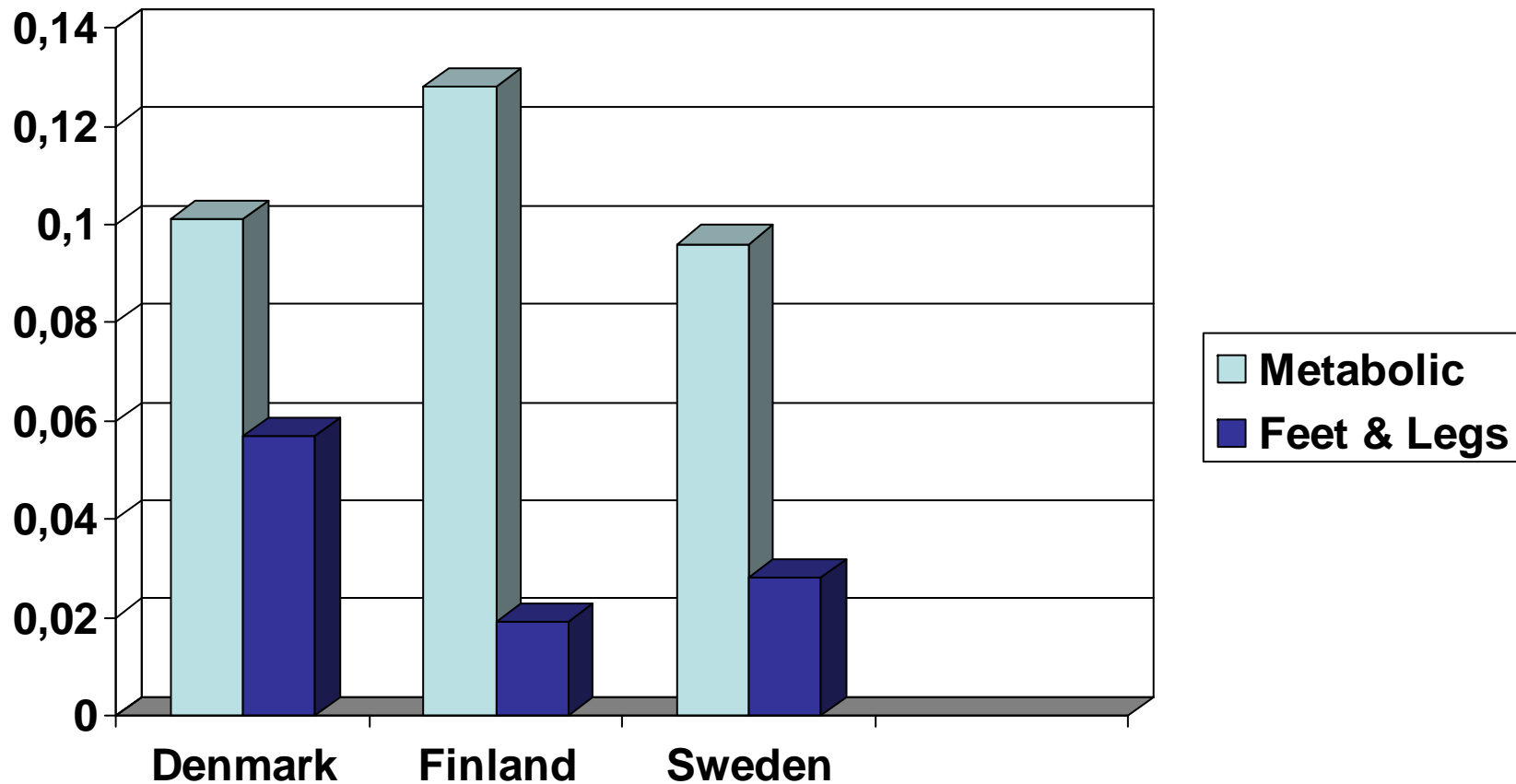
Early repr. (ERP)	Late Repr. (LRP)	Metabolic (MB)	Feet & legs (FL)
Ret. Placenta	Hormonal diseases	Ketosis	Feet & legs
Infectious diseases		Paresis	



Frequency of reproductive diseases in lactation 1. Holstein



Frequency of diseases in lactation 3. Holstein



Genetic parameters

$$h^2 = 0.005 - 0.03$$

Genetic correlations

ERP-LRP 0.33-0.40

RP-MB 0.17-0.49

RP-FL (RDC) 0.00-0.03

RP-FL (HOL) 0.10-0.36



Genetic parameters

$$h^2 = 0.005 - 0.03$$

Genetic correlations within lactation

Early-late repr. 0.33-0.40

Clinical mastitis lact. 1 0.15-0.45

All other correlations <0.49

First lactation correlations highest



Between lactation correlations

0.60-0.90



Nordisk Avlsværdiurdering

Model

Effect	Type
Calving age x country	Fixed
Year x month x country	Fixed
Herd x period (=5ys)	Fixed
Total heterosis	Regression
Population proportions	Regression
Herd x year	Random
Sire	Random



Use of EBVs

Lactation weights: 0.5 0.3 0.2

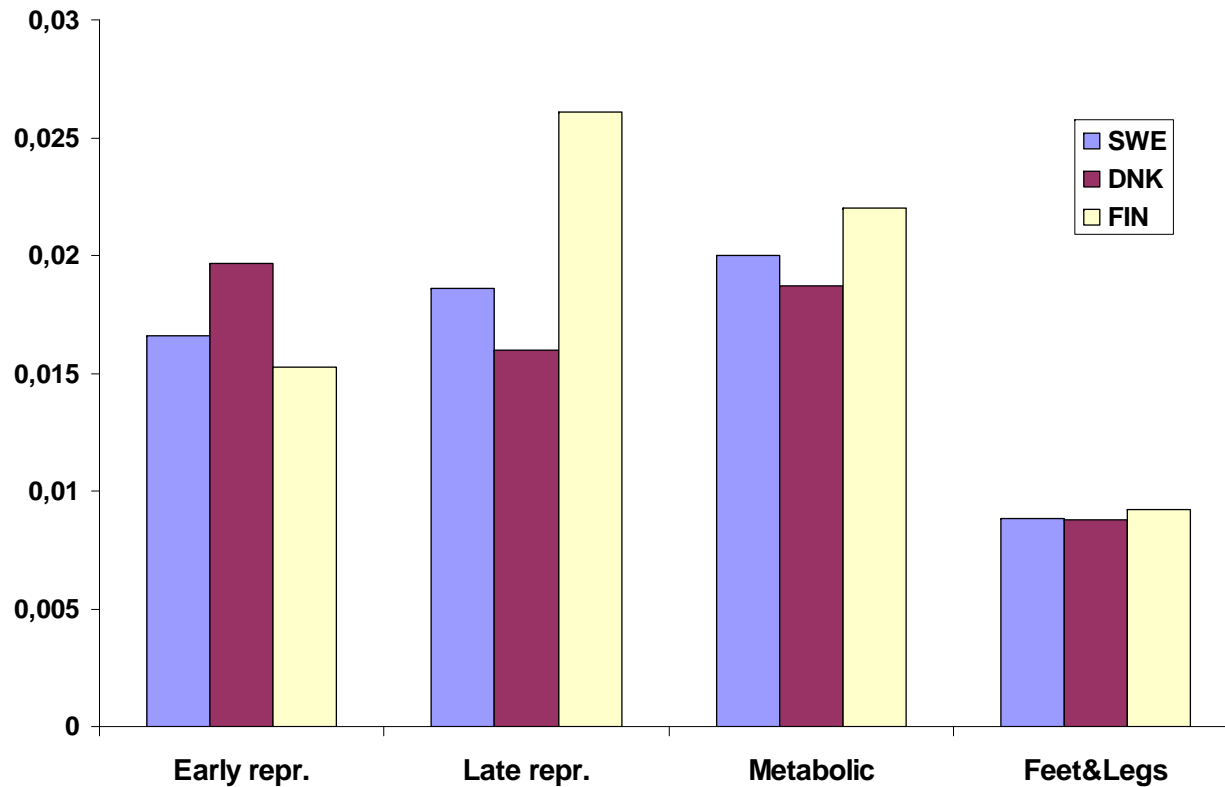
$$OD=1.93*ERP+1.05*LRP+1.97*MB+1.7*FL$$



- OD-index passed validation
- Will be used in Total Merit Index

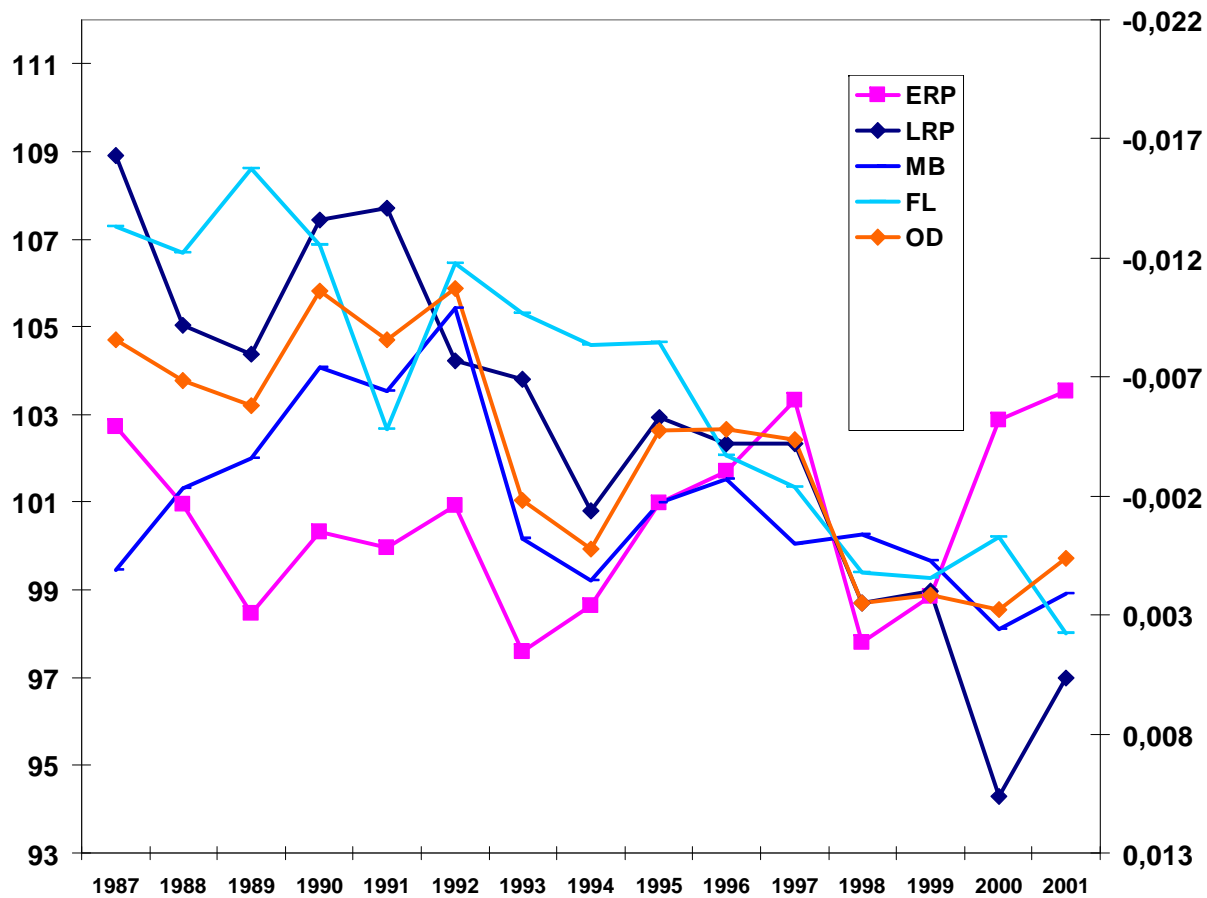


Standard deviation of EBVs for sires. Holstein



Nordisk Avlsværdiurdering

Sire trends RDC



Summing up

- A joint genetic evaluation between Denmark, Finland and Sweden in place

Harmonized – better use of data

Early productive

Late reproductive

Metabolic

Feet and Legs



Summing up

- OD index included in Total Merit Index
- Genetic control of other disease traits
 - for economy
 - for animal welfare



**Thank
You!**



Nordisk Avlsværdiurdering