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Economic status of dairy herds ranked by a reproductive performance indicator that accounts for the voluntary waiting period

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Background

- Good reproduction is an important key to profitable milk production
- Monitoring the reproductive performance (RP) is therefore important
- Several indicators are in use:
  - Days to 1st service, days open, calving interval
  - (1st) service conception rate, non-return rates
  - Fertility index

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Background, cont'd

- Problems with many indicators!
  - Selection bias
  - Affected by management strategies
- Solutions:
  - Survival analysis (InCalf100)
  - Account for strategy

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Aims

- Investigate associations between some RP indicators and economic status of the herd

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Material and methods

- Simulated data, using SimHerd
- 18 scenarios
  - 3 levels of reproductive physiology: loss of embryo or fetus and conception rate
  - 3 levels of management efficiency: estrus detection rate and pregnancy check
  - 2 levels of voluntary waiting periods (VWP): 49 and 77 days post partum
- 100 cow-herd, 10 years, 50 replicates

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M&M, cont'd

- RP indicators:
  - Calving interval (CI)
  - Fertility index, based on non-return, days open, # AI, etc (FI, de Kruif, 1980)
  - InCalf rate at 100 d pp (IC100)
  - Percent Pregnant at VWP + 30 d (PPVWP+30, Löf et al., 2008, 2010)

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M&M, cont'd

- Economic components
  - + Income from sales (milk, meat, animals)
  - – Variable costs (feed, AI, health, other)
- Prices according to 2007 Swedish market price (Nielsen et al., 2010)
- Data from last 2 years of simulation

Technical results 1:
Median of RP indicators according to repr.phys + mgm

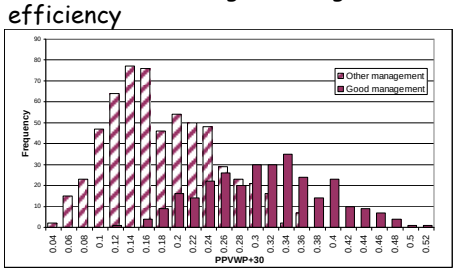
	Good	Average	Poor
CI	377	401	415
FI	61	42	51
IC100	0.44	0.23	0.11
PPVWP+30	0.38	0.20	0.10

Technical results 2:
Median of RP indicators according to VWP

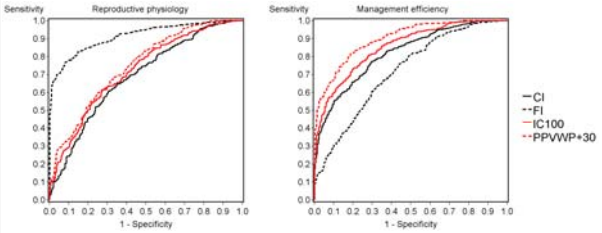
	49 d	77 d
CI	388	407
FI	50	48
IC100	0.30	0.18
PPVWP+30	0.19	0.22

Technical results 3:
Discrimination

PPVWP+30 according to management efficiency



Technical results 4:
ROC-curves*



*ROC = Receiver operating characteristics

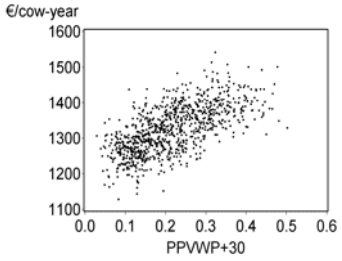
Economic results 1:
Median net return according to repr.phys. + mgm

	Good	Average	Poor
€/cow-year	1400	1331	1255

and VWP

	49 d	77 d
€/cow-year	1329	1319

Economic results 2:
Net return according to RP indicators



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CI	-0.55
FI	-0.06
IC100	0.61
PPVWP+30	0.65

Points for discussion

- Simulated data
  - SimHerd has been successfully used
  - Technical results are in accordance with experience
- Benefit/cost analyses
- Use VWP; but how to get VWP?

Conclusions

- Intended use of RPI's affect their usefulness
- Account for management strategies
- Money counts! Thus PPVWP+30 is the best ☺

Thank you for your attention!