

Management and economic aspects of using sexed semen on herd level

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Introduction

Sexed semen commercially available in Danmark since May 2007

Recent 12 months, among all Danish dairy herds:

| | | Total number of inseminations | Proportion sexed semen |
|-------------------|---------|----------------------------------|---------------------------|
| Holstein | Heifers | 261,728 | 13.5% |
| | Cows | 726,974 | 1.7% |
| Jersey | Heifers | 44,517 | 20.6% |
| | Cows | 122,101 | 9.9% |
| Danish Red | Heifers | 28,710 | 15.9% |
| | Cows | 73,416 | 3.5% |

35% of all herds (across breeds) use >10% sexed semen

In these herds, 30-40% of all inseminations on heifers is with sexed semen

Introduction

Reproductive performance of sexed semen

Non-return rate after 56 days among heifers

| | Sexed Semen | Normal Semen |
|-------------------|-------------|--------------|
| Holstein | 56.7% | 70.3% |
| Jersey | 59.1% | 68.0% |
| Danish Red | 63.9% | 72.3% |

Material and Methods

Estimate profitability of sexed semen:

Easy way: semen + late conception + extra heifer calf +... + =

Complex way: simulation model

Simherd (Østergaard 2005)

Dynamic, mechanistic and stochastic simulation model predicting the production and states of a dairy herd with young-stock over time

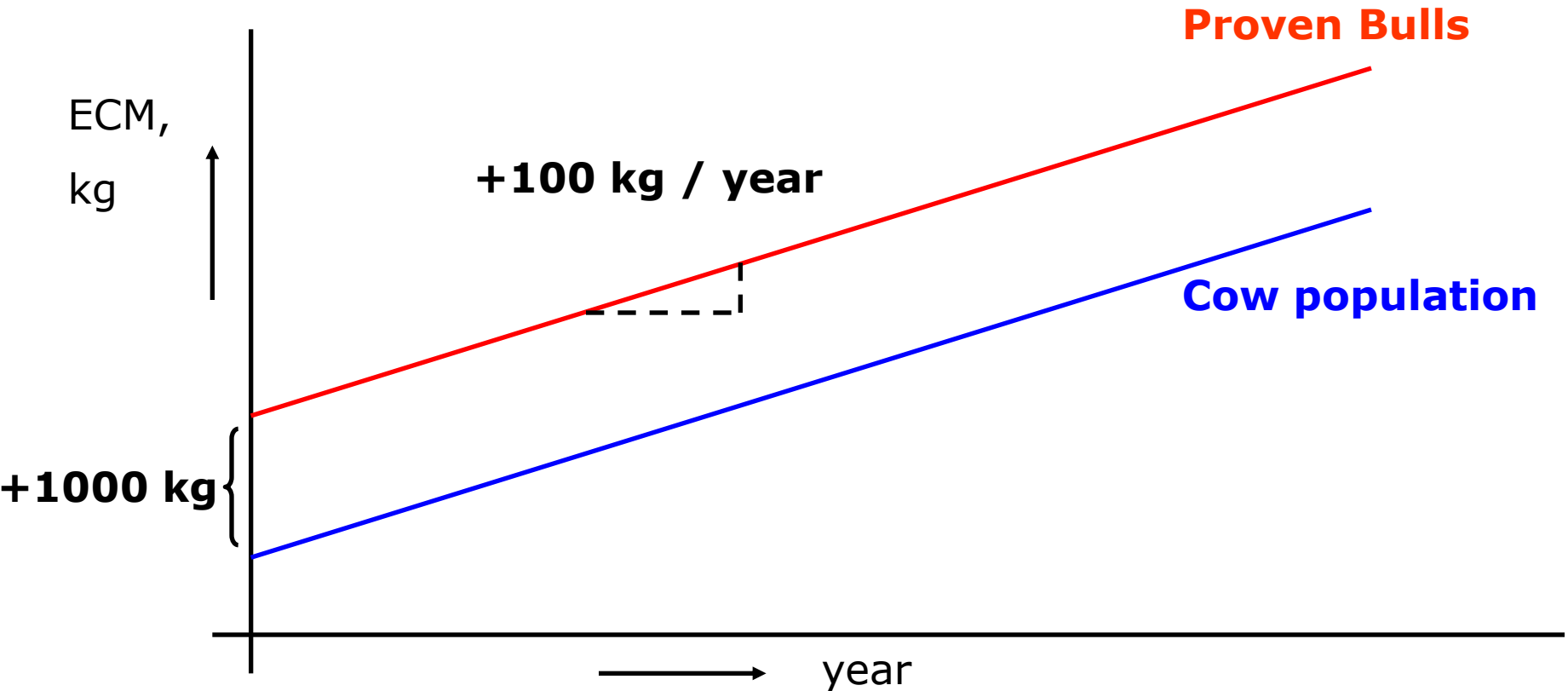
Material and Methods

Assumptions: semen and prices

| | Pregnancy rate | Sex rate | Price |
|------------------------|-----------------------------|-----------------|--------------|
| Normal Semen: | 60% | 48% | €11 |
| Sexed semen: | 51% | 90% | €40 |
| Heifer raising costs | €1,045 = €1.34 per day | | |
| Replacement heifer | €1,300 | | |
| Milk, kg ECM | €0.26 | | |
| Bull calf | €50 | | |
| Other costs and prices | Representative for DK, 2009 | | |

Material and Methods

Assumptions: genetic progress in the population (milk yield potential, Y-index)



In collaboration with Morten Kargo Sørensen, Aarhus University

Material and Methods

Scenario design

Breed the 70% best heifers with sexed semen
sell the other 30% and
keep herd size constant

Material and Methods

Scenarios studied for different herds (Holstein)

| | Calving Interval | Culling rate | Heat obs. rate heifers | Preg rate heifers * |
|--------------------|------------------|--------------|------------------------|---------------------|
| Standard | 405 | 38% | 60% | 60% |
| Poor repro heifers | 405 | 38% | 50% | 50% |
| Good repro heifers | 405 | 38% | 70% | 70% |
| Poor repro cows | 412 | 45% | 60% | 60% |
| Good repro cows | 385 | 31% | 60% | 60% |

* Pregnancy rate for normal semen; x 85% for sexed semen

Results

Technical results of scenario 1

| | Standard | 70% SS on heifers* | Difference |
|--------------------------|----------|--------------------|------------|
| Cow-years | 198.0 | | |
| Replacement rate,% | 37.9 | | |
| Calving interval, days | 405 | | |
| Calves per cow-year | 1.02 | | |
| Dystocia-rate | 8.4% | | |
| Bull calves | 94 | | |
| Heifer-years | 186 | | |
| Sold heifers | 9 | | |
| Doses sexed semen | - | | |
| Doses normal semen | 482 | | |
| Age at first calving, mo | 25.8 | | |

* SS=sexed semen

Results

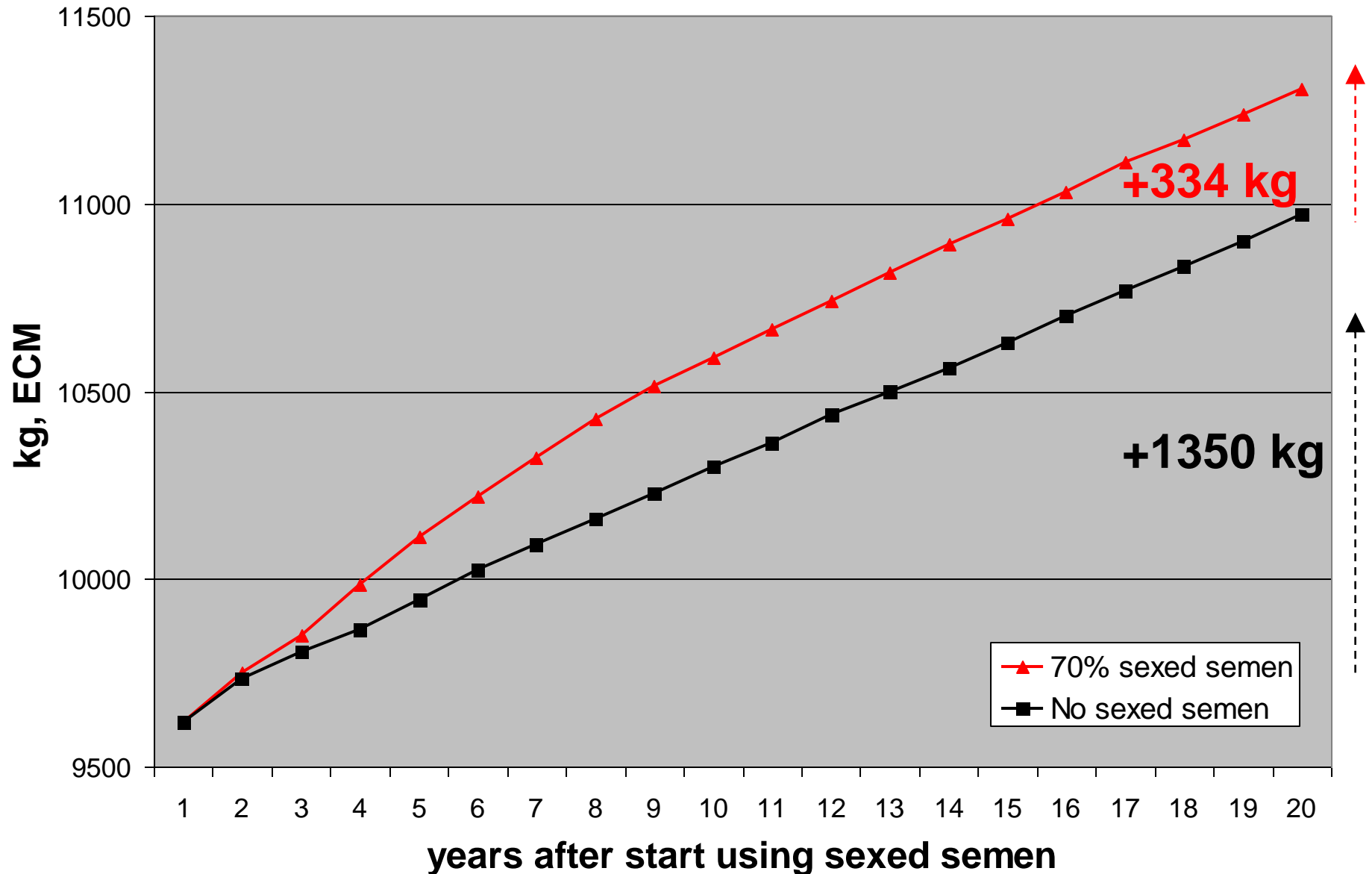
Technical results of scenario 1

| | Standard | 70% SS on heifers* | Difference |
|--------------------------|----------|--------------------|-------------|
| Cow-years | 198.0 | 198.2 | +0.2 |
| Replacement rate,% | 37.9 | 44.5 | +6.6 |
| Calving interval, days | 405 | 403 | -2 |
| Calves per cow-year | 1.02 | 1.04 | +0.02 |
| Dystocia-rate | 8.4% | 7.4% | -1% |
| Bull calves | 94 | 63 | -31 |
| Heifer-years | 186 | 254 | +68 |
| Sold heifers | 9 | 28 | +19 |
| Doses sexed semen | - | 174 | +174 |
| Doses normal semen | 482 | 393 | -89 |
| Age at first calving, mo | 25.8 | 26.1 | +0.3 |

* SS=sexed semen

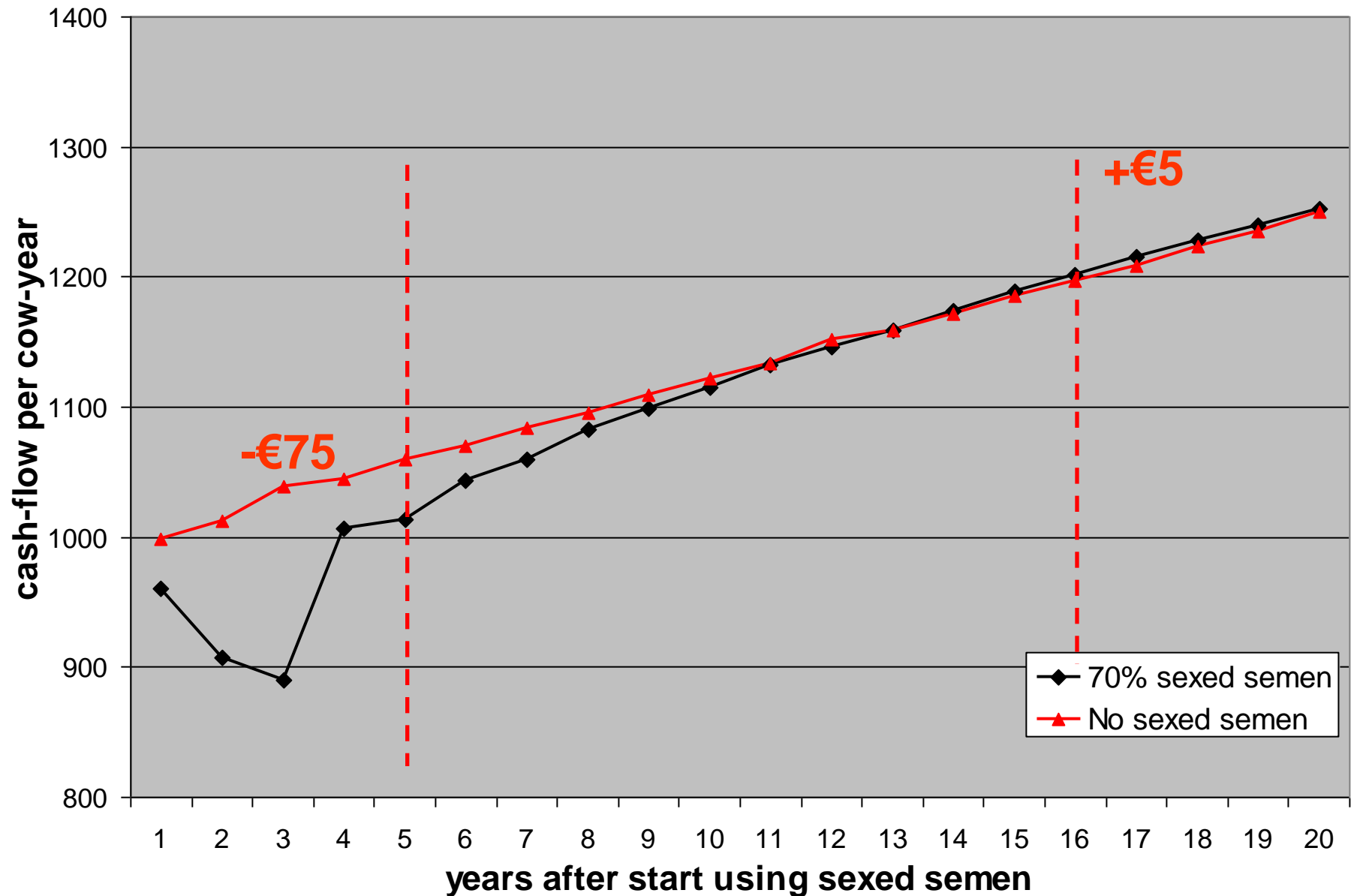
Results

Change in milk yield over time (kg ECM/cow-yr)



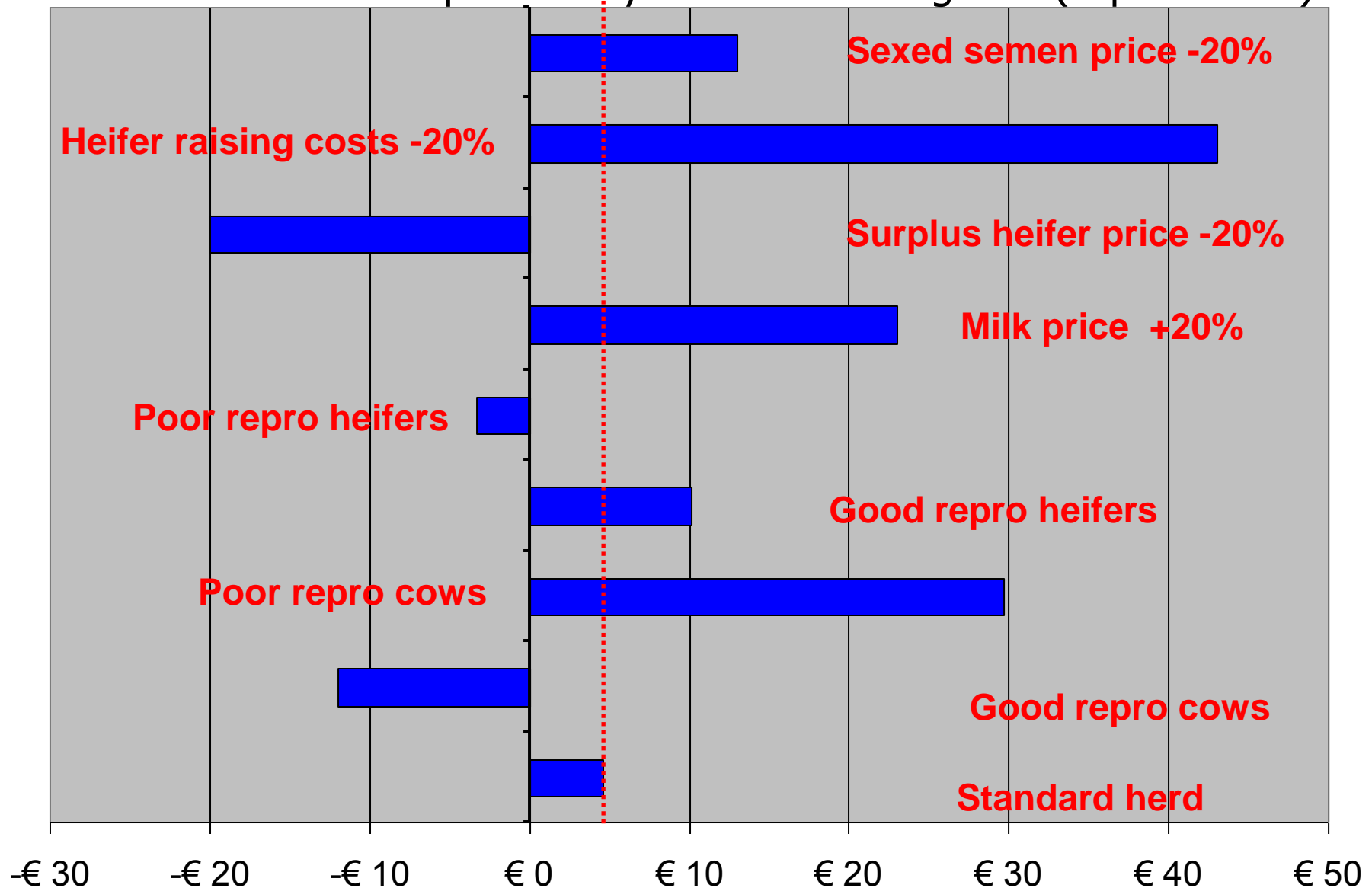
Results

Change in cash-flow per cow-year over time (€)



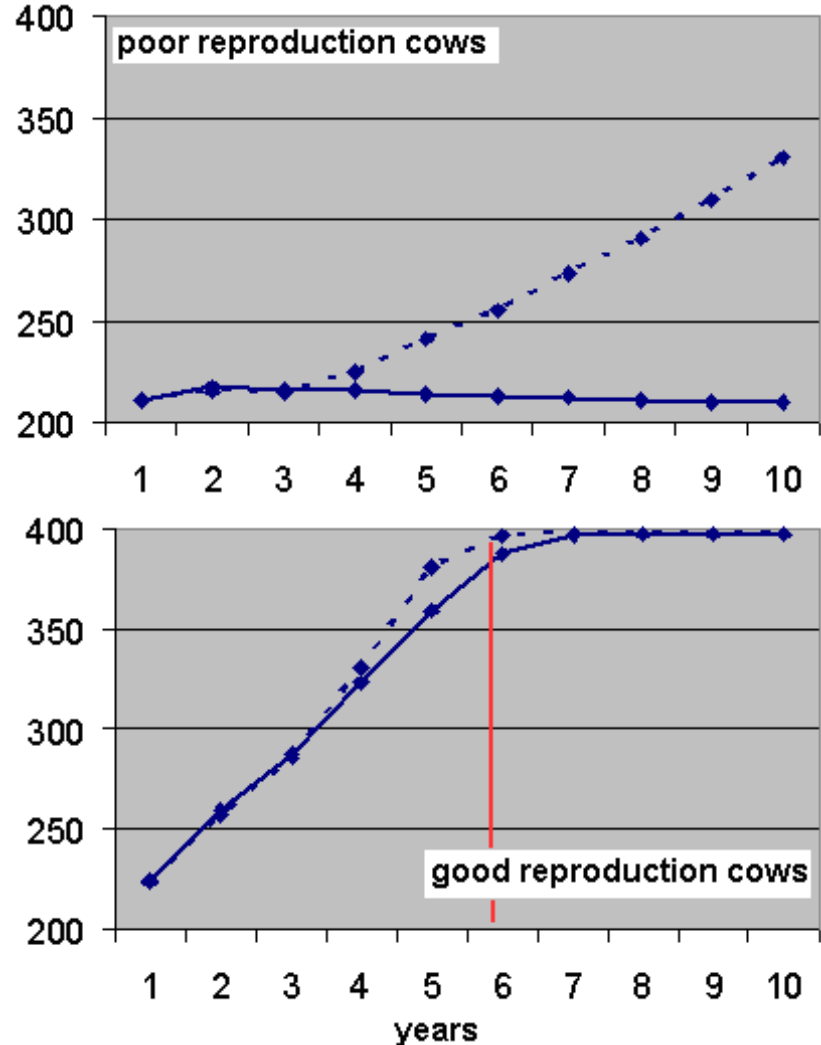
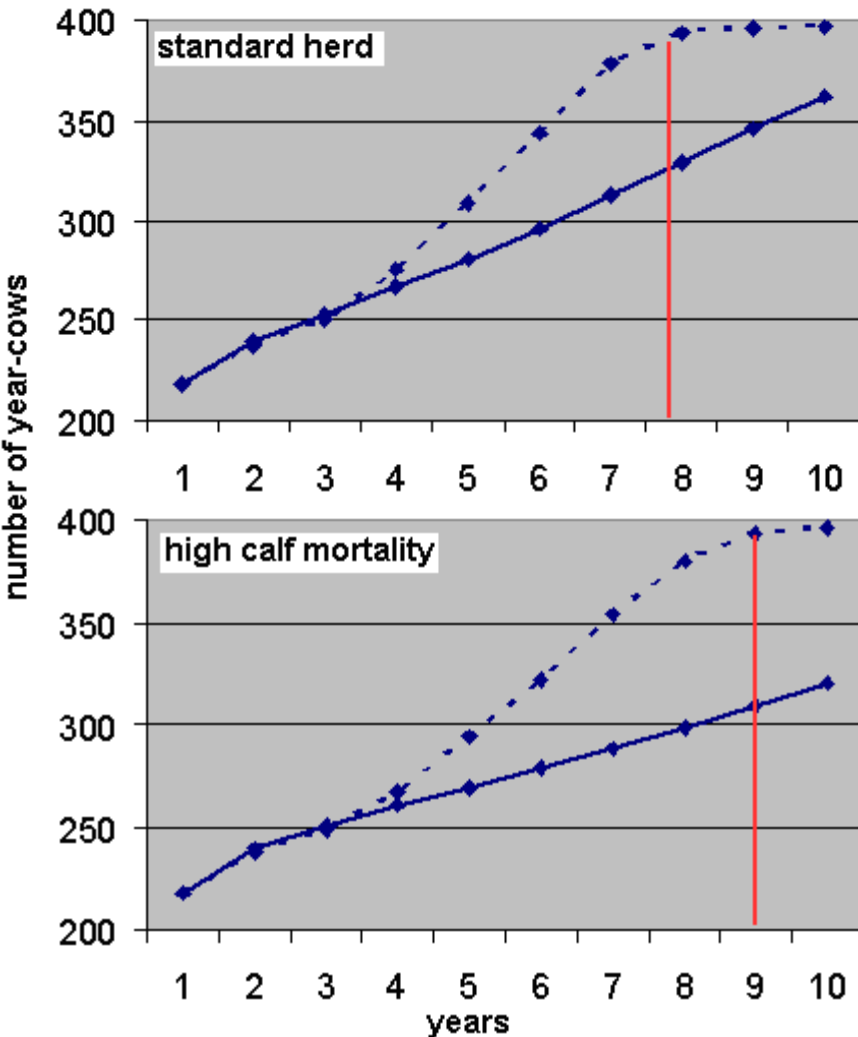
Results

Increase in cash-flow per cow-year on the long run (equilibrium)



Results

Technical results of using 70% sexed semen, with **herd expansion** as a goal, for different situations



Discussion

- Prices (heifers, milk) now and in the future (20 years!?)
- Validation of genetic progress
- Other aspects of herd expansion

Conclusion

Sexed semen on 70% of heifers is, given current prices and constant herd size, not very interesting

Cash flow increases with **€5** per cow-year in a standard herd

Increased interest in case:

Herd is performing poorly; internal value of heifers is high

Milk price $> €0.26$

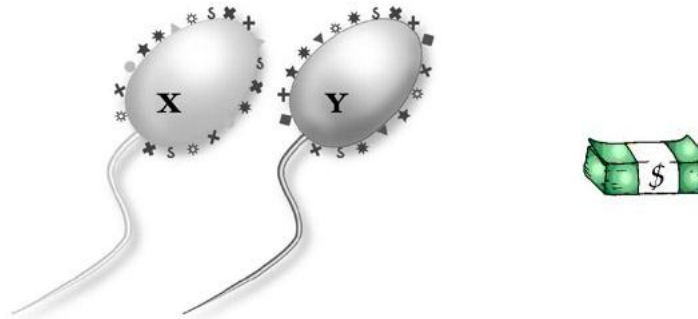
Price of surplus heifers $> € 1,300$

Heifers can be raised for $< €1.34$ per day

Price per sexed semen dose $< €40$

The goal is herd expansion

Questions and comments



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