NCBC
Dairy Sire Selection

NCBC Scientific Selection Committee

- **To develop a transparent strategy to optimally select young test bulls for the NCBC Dairy Test program**

- **Ongoing project**

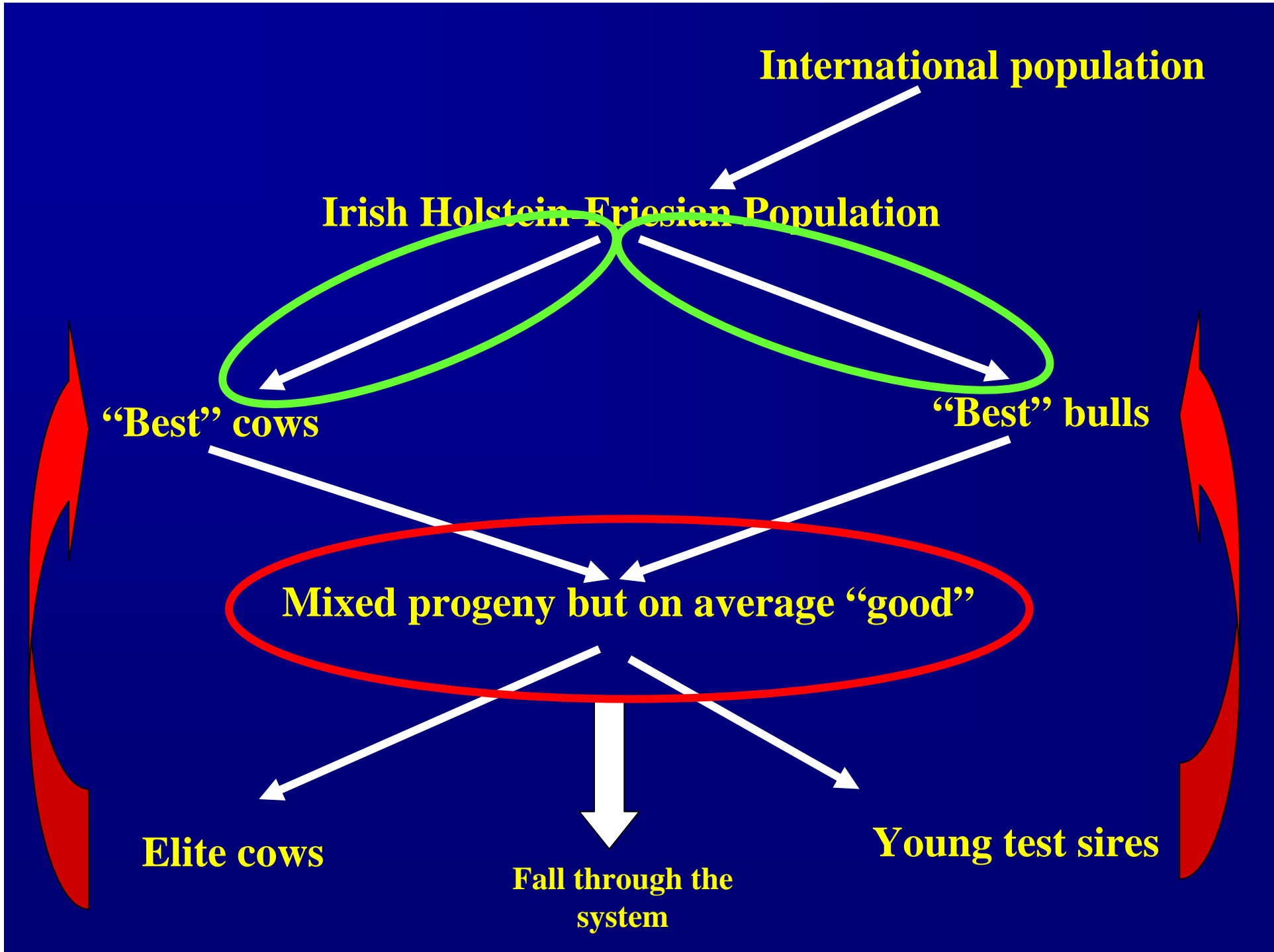**International population**

Irish Holstein-Friesian Population

"Best" cows

"Best" bulls

Mixed progeny but on average "good"
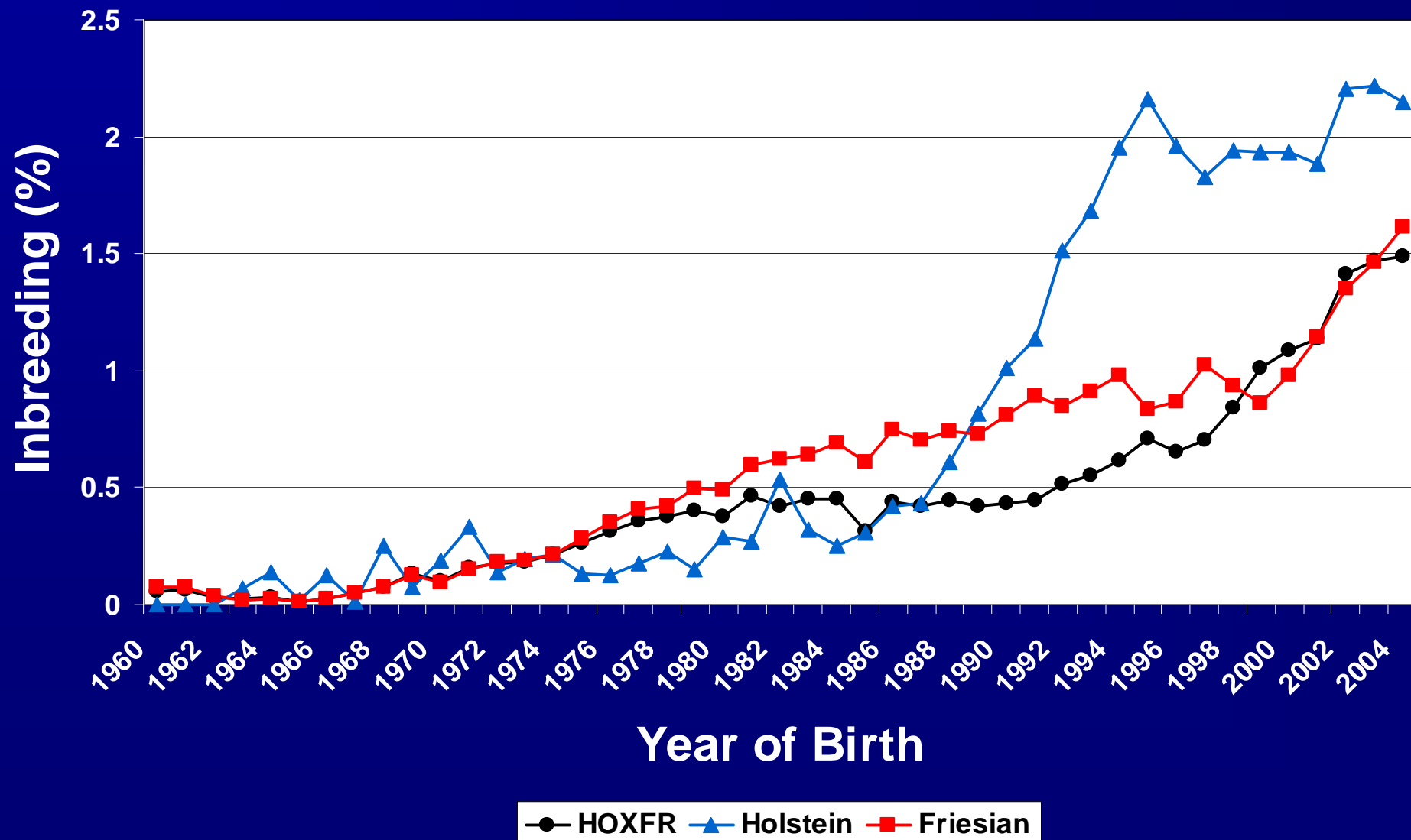
Elite cows

Fall through the system

Young test sires

Factors to consider

- **Population issues: Inbreeding**
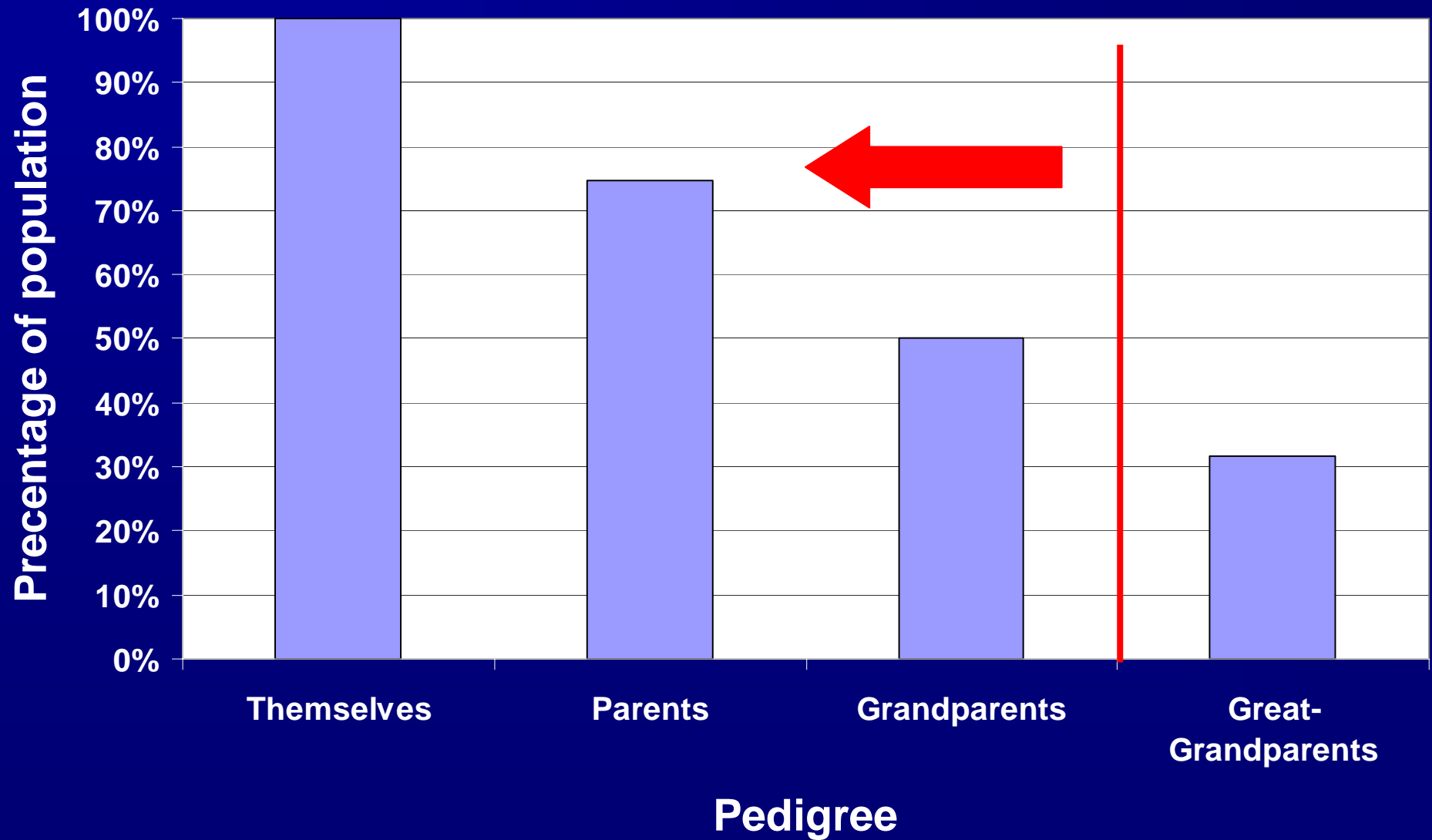- **Sires of sons**
- **Bull dams**
- **Future technology**

Sires of sires

- **Less place for computer programming**

- **Only "active" sires**

- **Reliability of proofs accounted for by lower usage**

- **Selected by hand from top 500 AI sires on EBI**

- **Only Hol/Fr in current model**

- **PTA for mammary and feet & legs must > -2**

- ➔ *84 <u>potential</u> sires of sires*

ICBF database
3.25 million females

↓ *Must be alive and milk recording*

396,529

↓ *2 full generations of pedigree*

198,146

↓ *≥75% Holstein-Friesian*
>90% breed fraction known

97,585

↓ *>1st parity*
Every calving interval <500 days
Average calving interval <400 days

38,412

Age 1st calving <38 months
Lactation length >100
↓
December to April calver
Milk Subindex >€0
Fertility Subinex >€0

4,840

Why not just top EBI

- **Top 100 females on EBI**
  - **65% RUU**
  - **22% OJI**
- **Top 1000/2000 females on EBI**
  - **83% RUU**
  - **5% OJI**

•Using the proposed method the top 1000 cows have
222 different sires (140 from AI)

Mating program

- **Mate every combination**
  - EBV production + fertility
  - Type
  - Inbreeding & coancestry
  - EBI (and balance of EBI)

  } **Restrict**

- **Linear programming**
  - Maximise an objective (EBI + coancestry)
  - Under constraint(s)
    - Number of total matings
    - Number of matings per sire
    - Number of matings per dam (initially 1)

- **Tweak & add**

Conclusions

- **Sires of sires selected**
- **Dams of sires needs more refinements**
  - **Suggestions?**
- **Needs to be refined year on year**
- **Power of genomics in the future**
  - **Greater accuracy of selection of both dams and calves**