How sustainable are the breeding programs of the global main stream dairy breeds?

The Latin-American situation

F.E. Madalena
Federal University of Minas Gerais
Belo Horizonte-MG, Brazil
www.fernandomadalena.com

Main dairy breeds

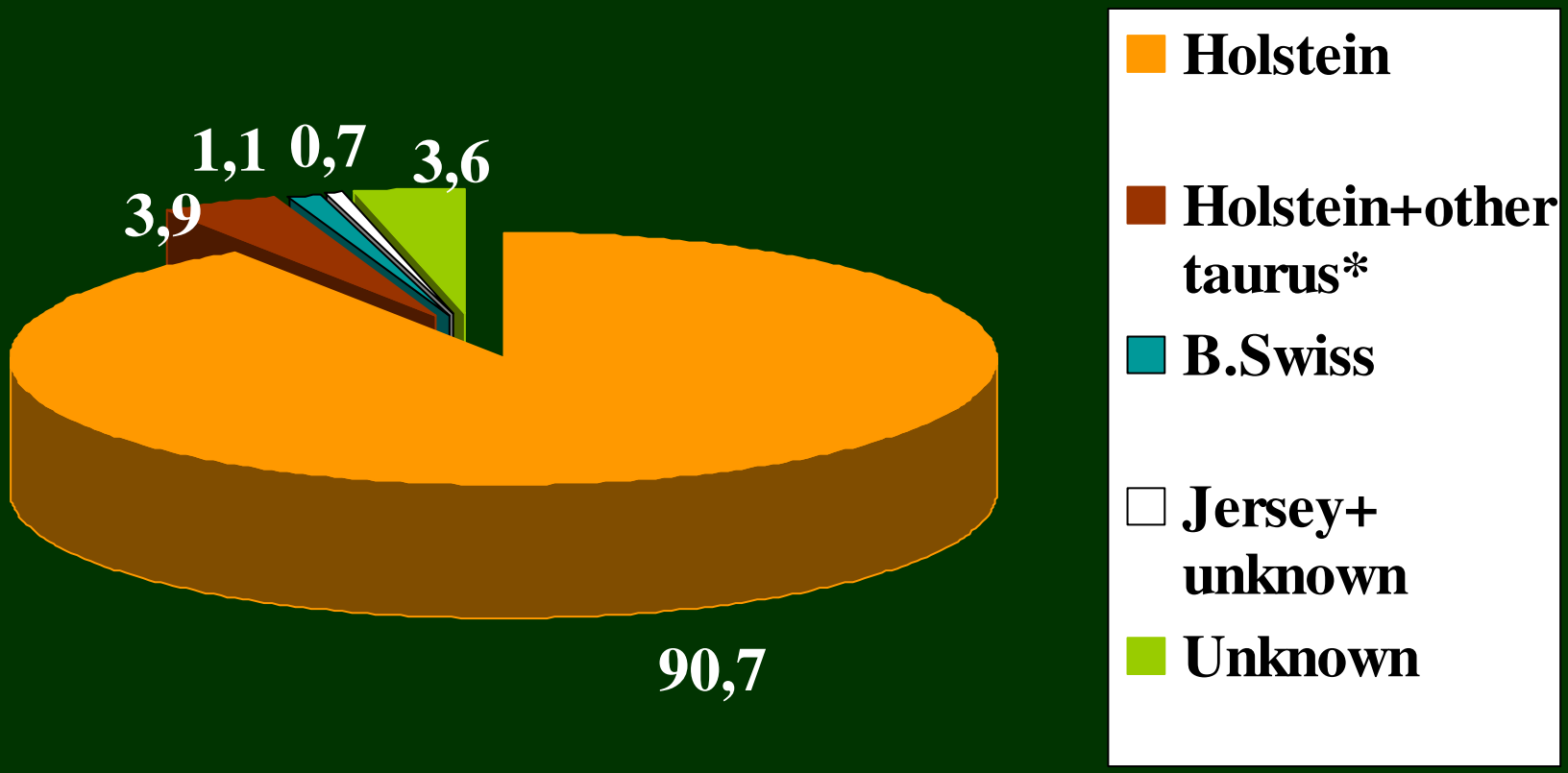
Mainly Holstein/Zebu (Brahman)

Mainly Holsteins in highlands

Mainly Holstein/Zebu (Gir)

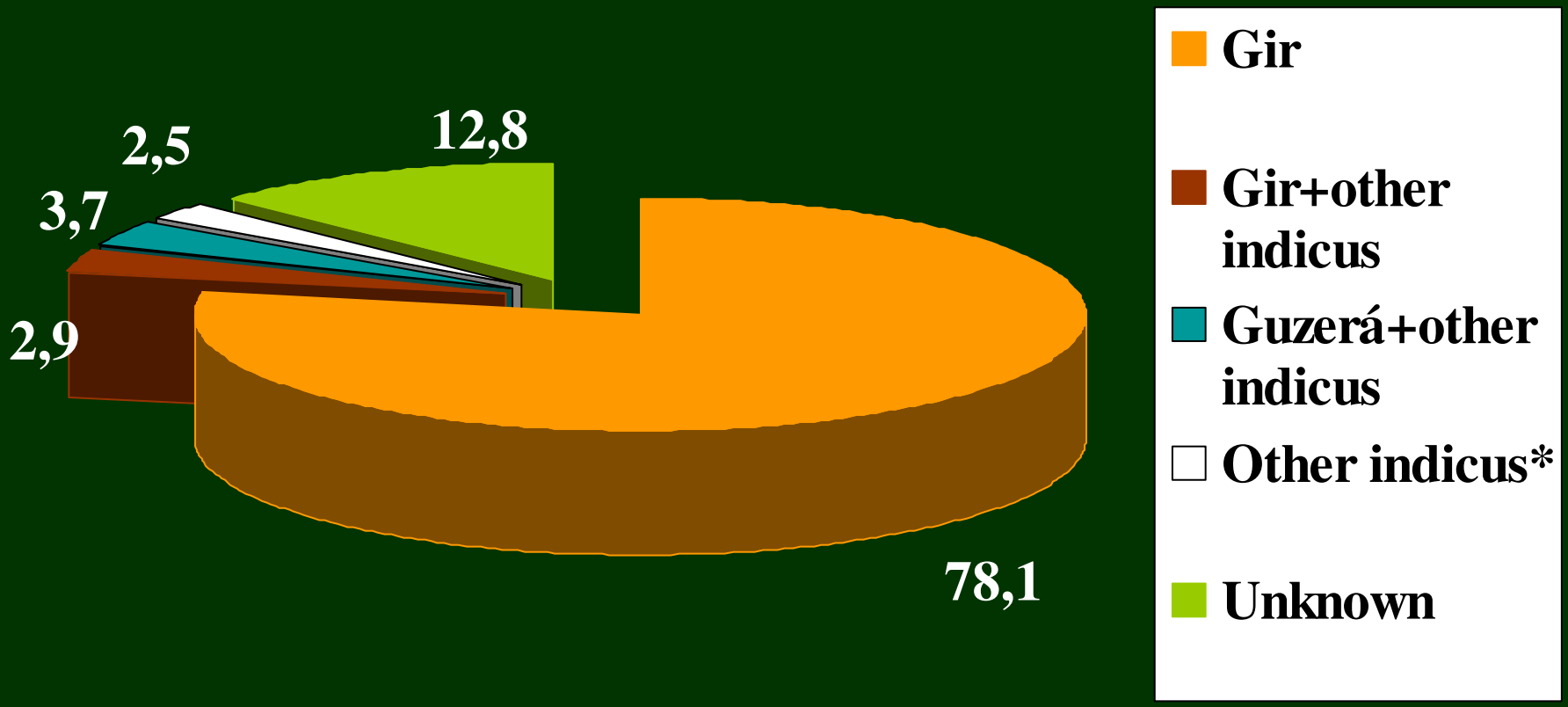
Mainly Holsteins

Percent dairy farms with predominant *B. taurus* breed in Minas Gerais, Brazil (N = 281 farms)



*Brown Swiss, Jersey, Caracu

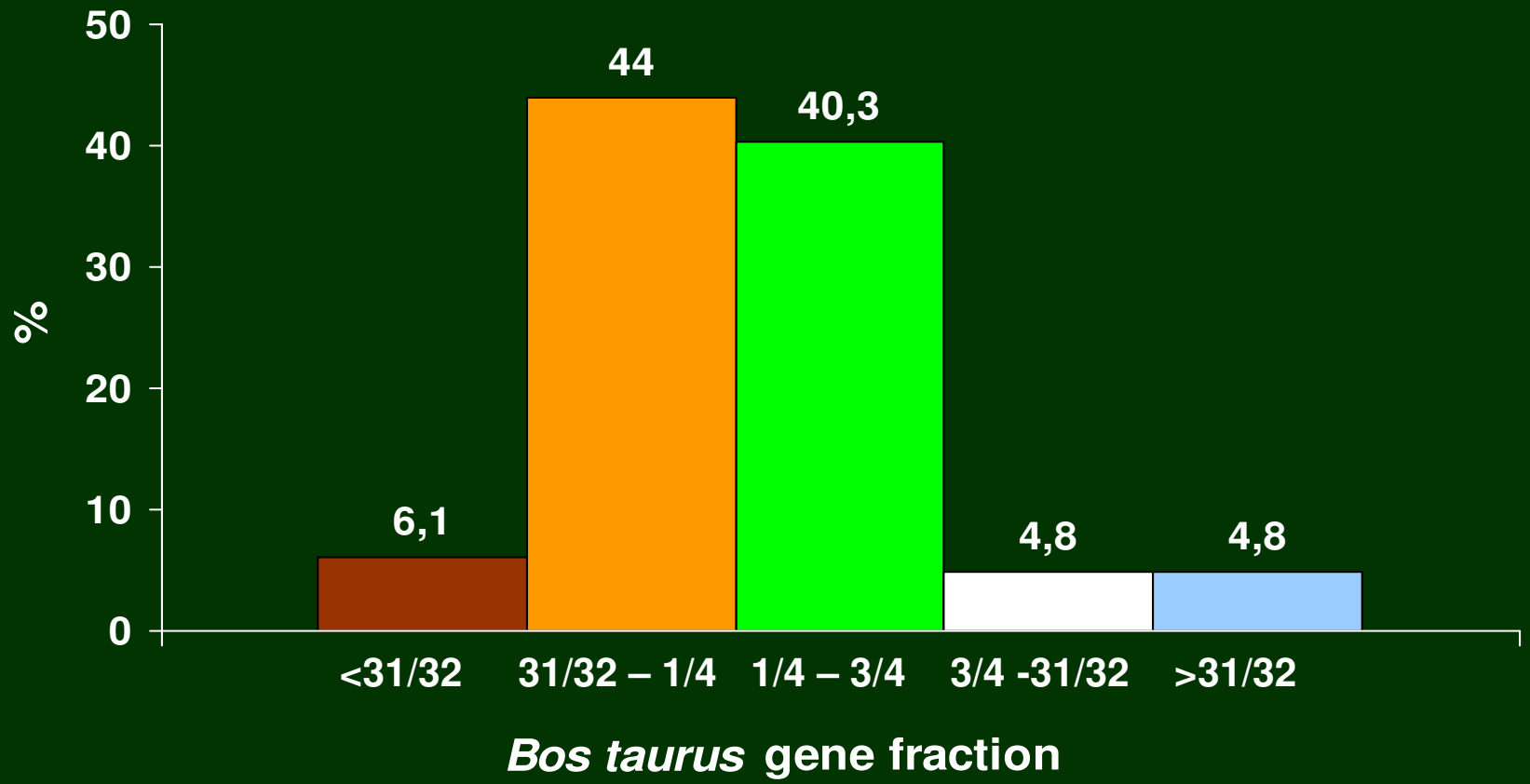
Percent dairy farms with predominant *B. indicus* breed in Minas Gerais, Brazil (N = 274 farms)



*Nelore, Indubrasil

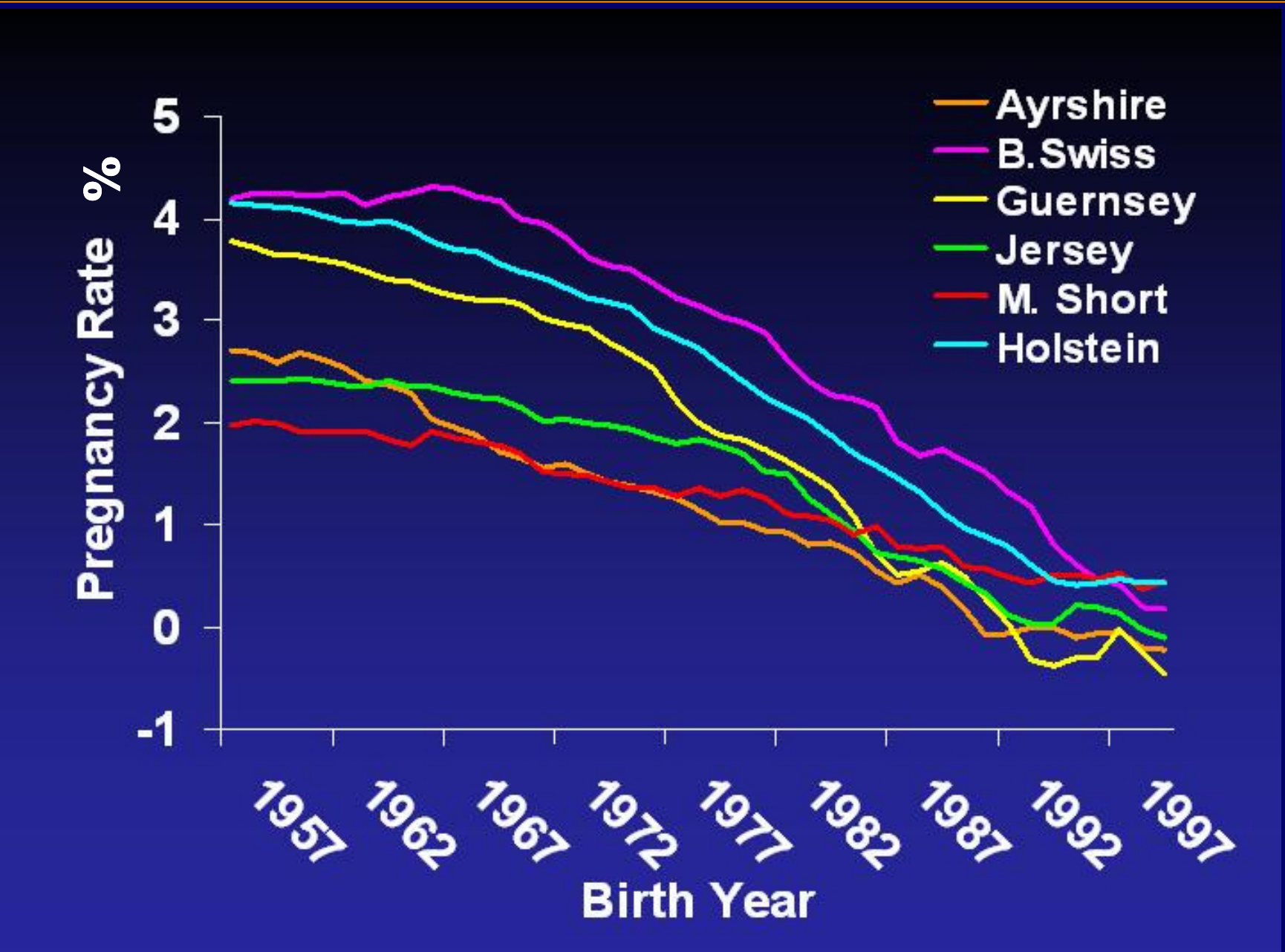
Bos taurus fraction in 7195 dairy cows in 283 farms in Minas Gerais

Madalena et al. (1997)



Genetic trends in fertility in dairy cattle

USDA (2003)



Annual culling and death rate in USA Holstein cows

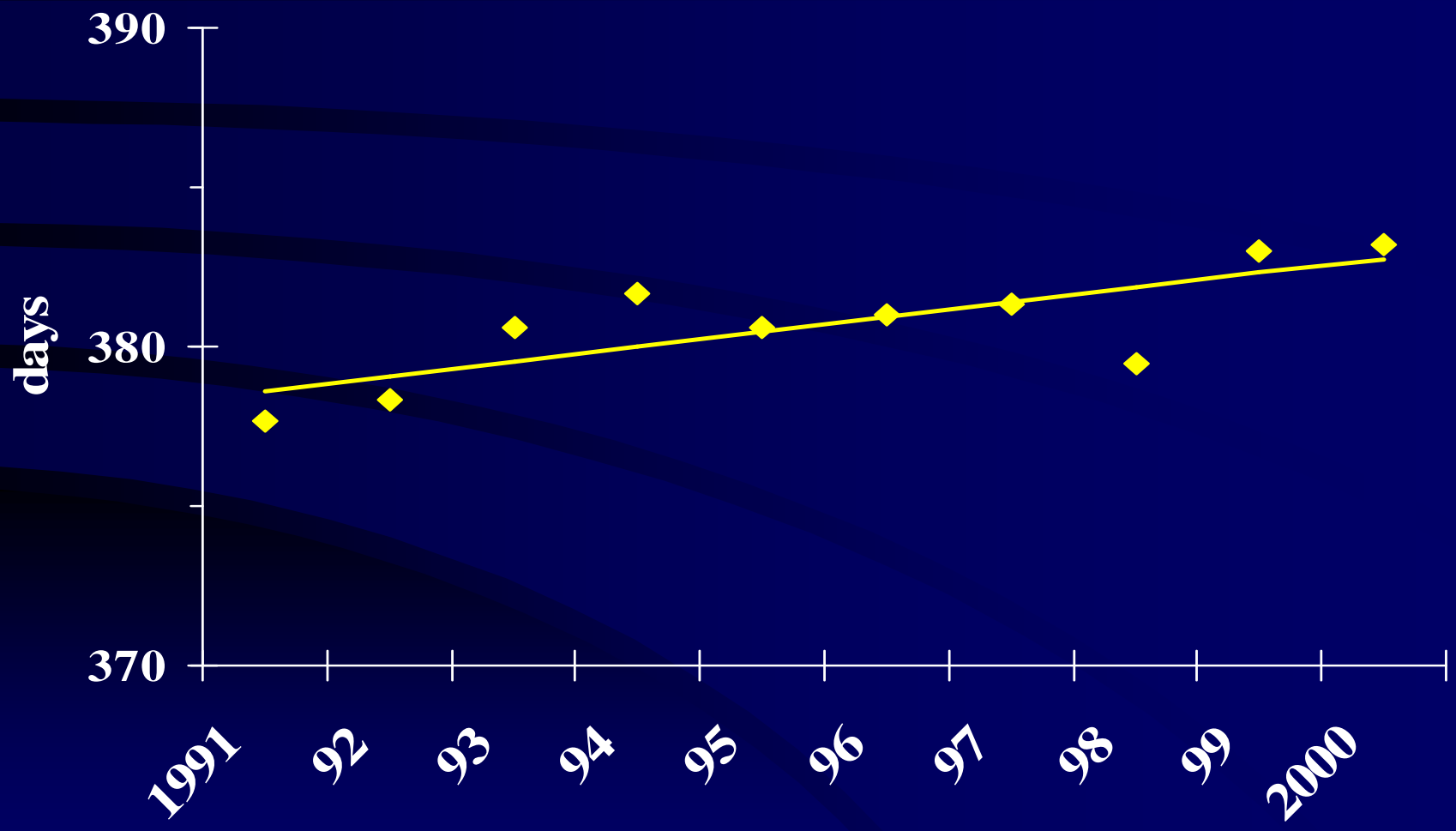
References in paper

	Culling %	Involuntary % [1]	Death %
Mid West	38		
Idaho	38		
Several States	34 to 36	84 to 88	6 to 8
4000 farm survey	26	81	5
10 States	32	80	11
1980-1991			< 2

[1]Percent of total culls

Calving interval in Holsteins in the State of Parana, Brazil (CI>450 d disregarded)

(Wolff et al. 2004)



Regression of calving interval in Mexican Holsteins on EBV for milk in the USA:

+ 2.4 d/1000 kg milk

r_g = 0.10

30% cow culling due to low fertility

Cienfuegos-Rivas et al. (2006)

Regression of calving interval in Brazilian Holsteins on EBV for milk in Brazil:

+ 39.7 d/1000 kg milk

r_g = 0.75

Silva et al. (1998)

Milk yield in Brazilian Holsteins x yield in the USA rg = 0.85

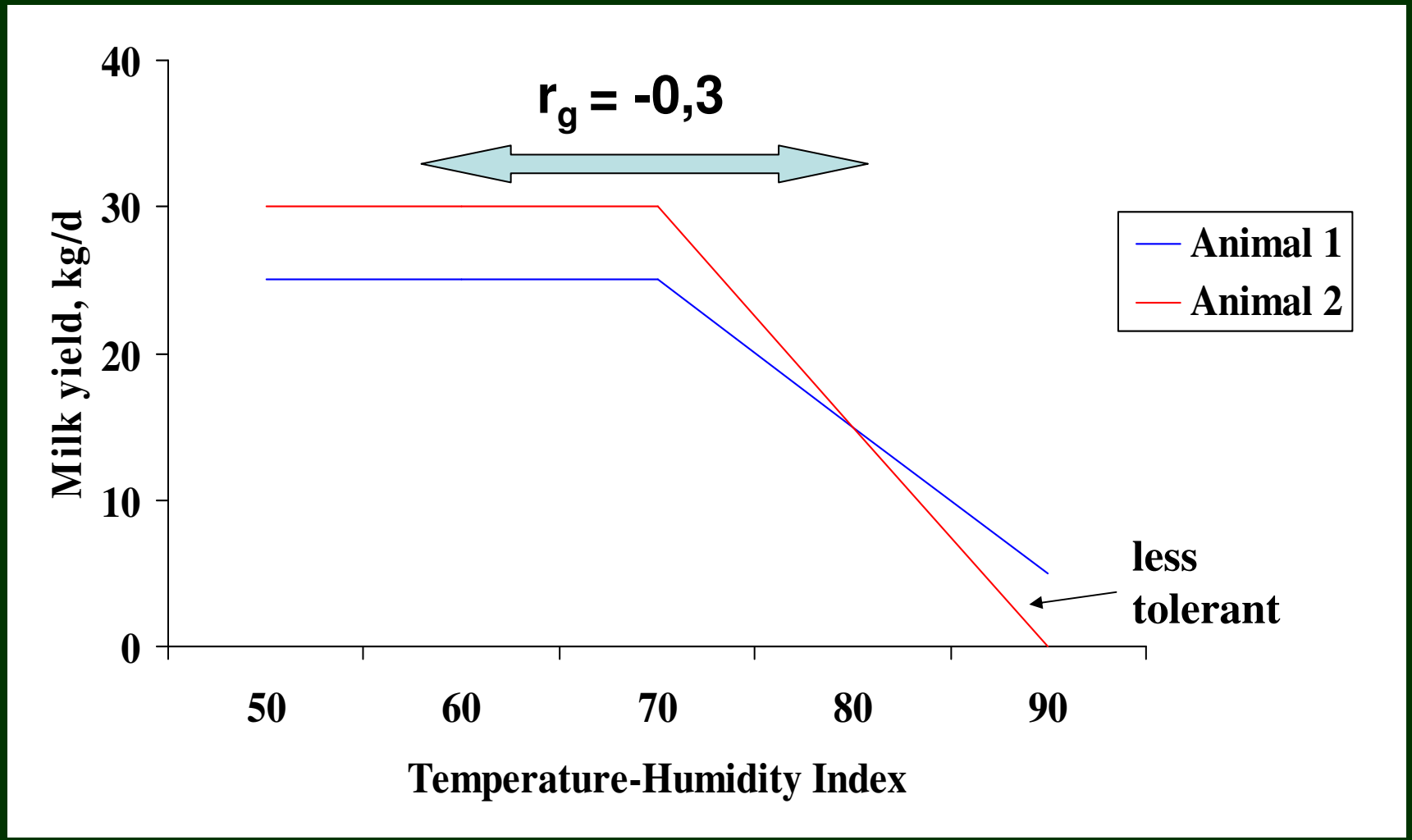
Costa et al. (2000)

“lameness in lactating cows in free-stalls are a serious problem in the Belo Horizonte basin” (Brazil)

Prevalence = 30,3% of the cows

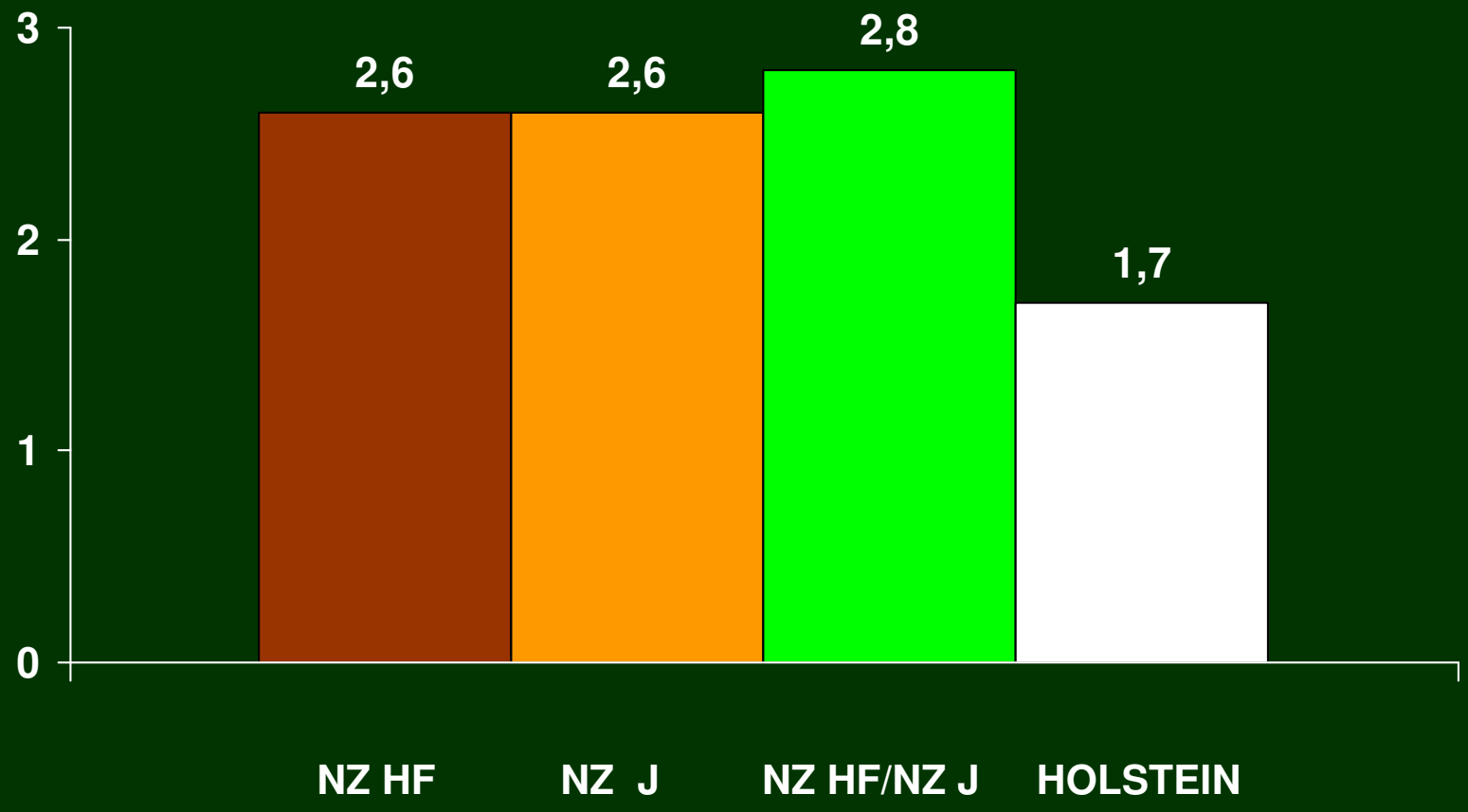
Molina et al. (1999)

I. Misztal group: milk yield x heat stress in Georgia, USA

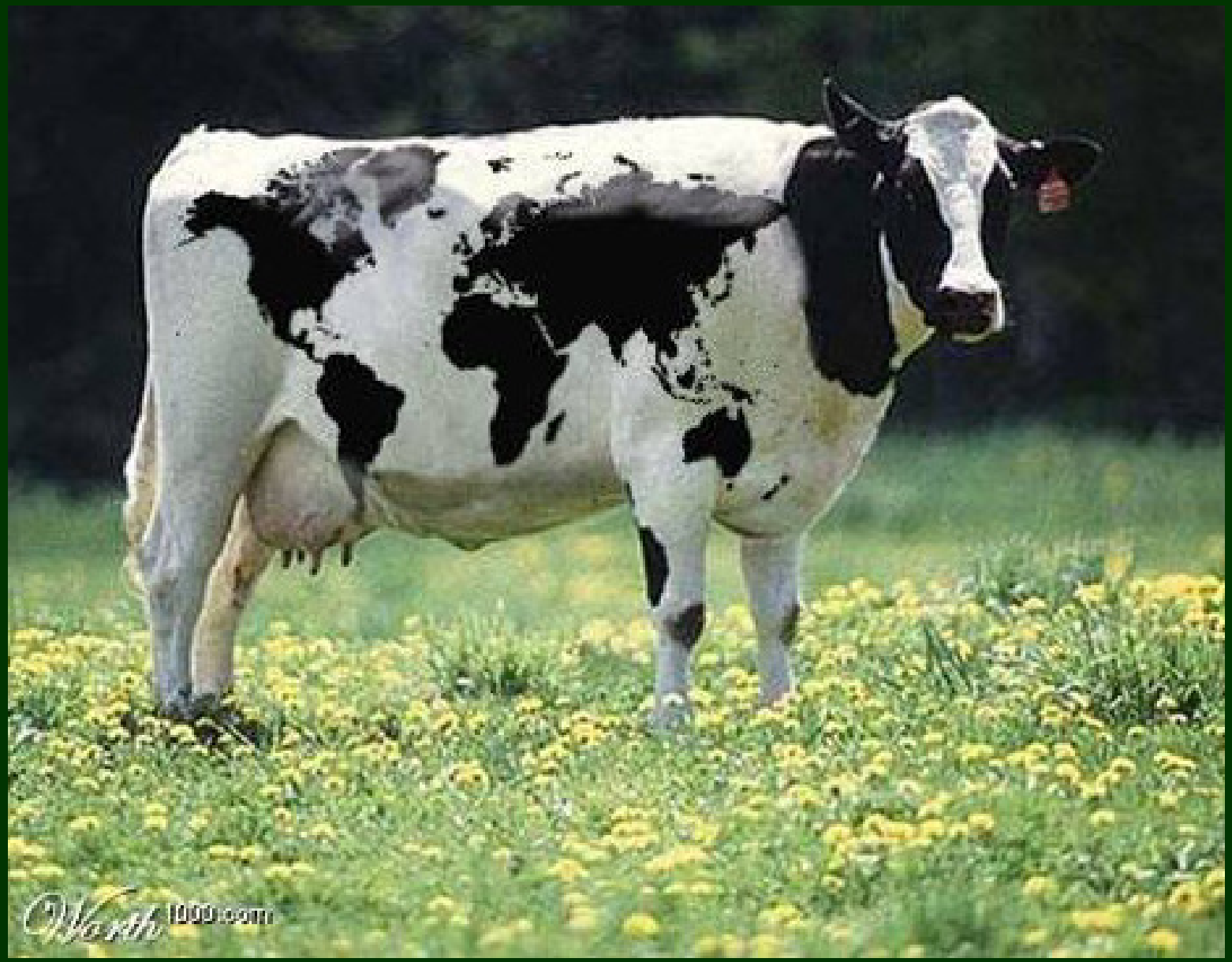


Simulation comparison of New Zealand Holstein-Friesian, NZ Jersey and Holstein semen in Argentine

López-Villalobos et al. (2001)



Globalized cow



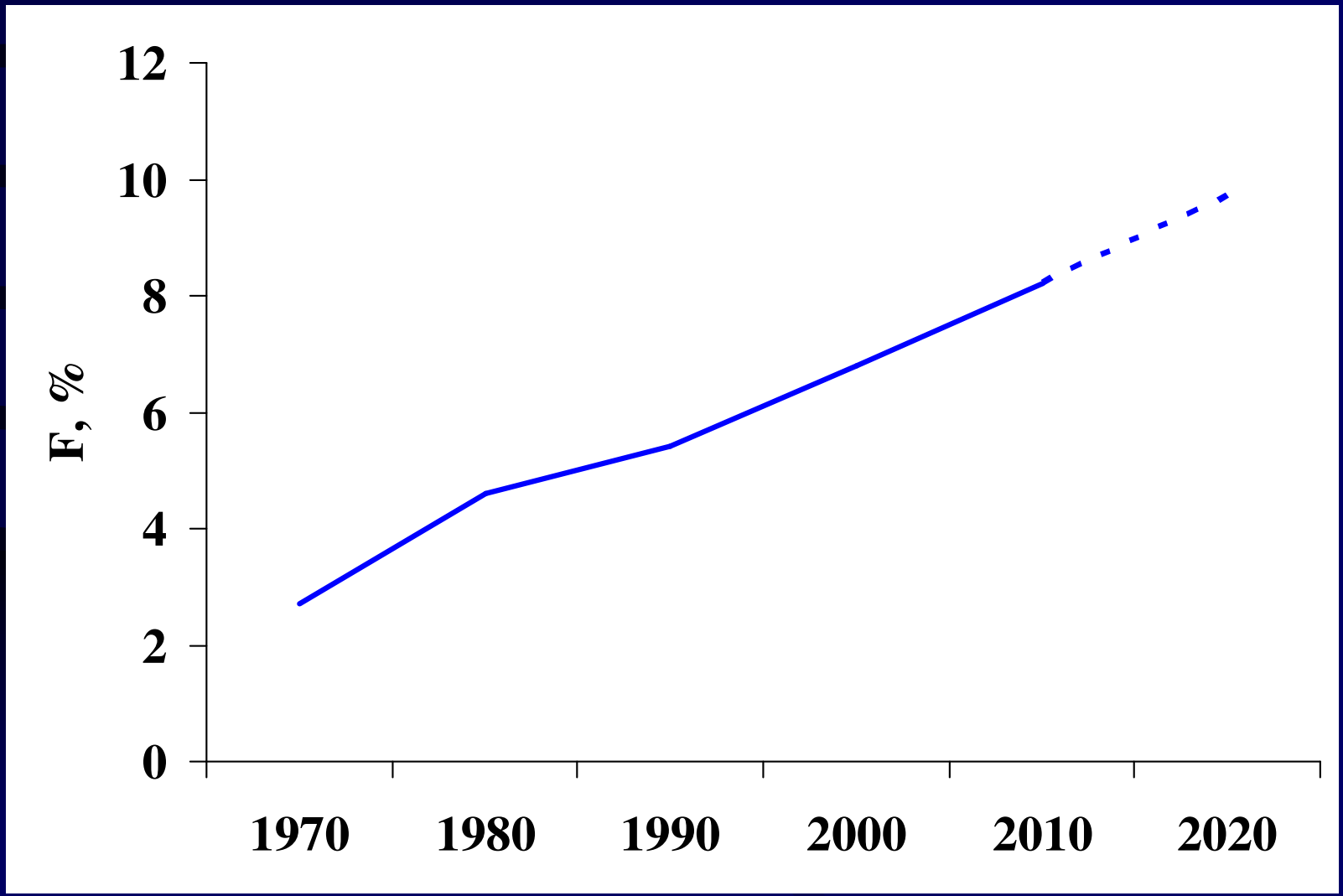
Percent proven bulls born in each country in 1999, descendants of Round Oak Round Apple Elevation and Hanoverhill Starbuck

Van Doormal et al (2005)

	Elevation	Starbuck
Australia	95,6	31,9
Canada	99,5	85,0
Denamark	96,0	47,9
France	96,0	46,9
Germany	99,7	65,8
UK	94,7	39,1
Irland	82,3	40,4
Italy	98,5	56,0
Japan	99,4	34,1
The Netherlands	94,6	35,1
New Zealand	89,1	23,9
Sweden	94,2	44,6
USA	96,5	38,2

Average inbreeding in USA Holsteins

Funk (2006)



Paternal grandsires of Brazilian Holstein cows

N> 82,000

Zambianchi (2001)

Round Oak Round Apple Elevation = 24%

Pawnee Arlïnda Chief = 22%

Factors affecting the prices of Holstein semen imported to Brazil Madalena et al. (1985)

Variables	R^2
•Relationship with famous sires	0,69
•PDs & reliabilities (milk, fat & type)	0,43
•All	0,79

An announced tragedy

- High r_g between yield and fertility long known e.g. Schmidt and Van Vleck (1974)

r_g milk yield x calving interval = 0.5

- Logical weights for selection: 5 or 6 Yield : 1 C. interval

or

- Just ignore calving interval in selection

Iowa experiment – AI with high *vs* average PTA sires

(High-Avge. PTA milk = 1076 kg)

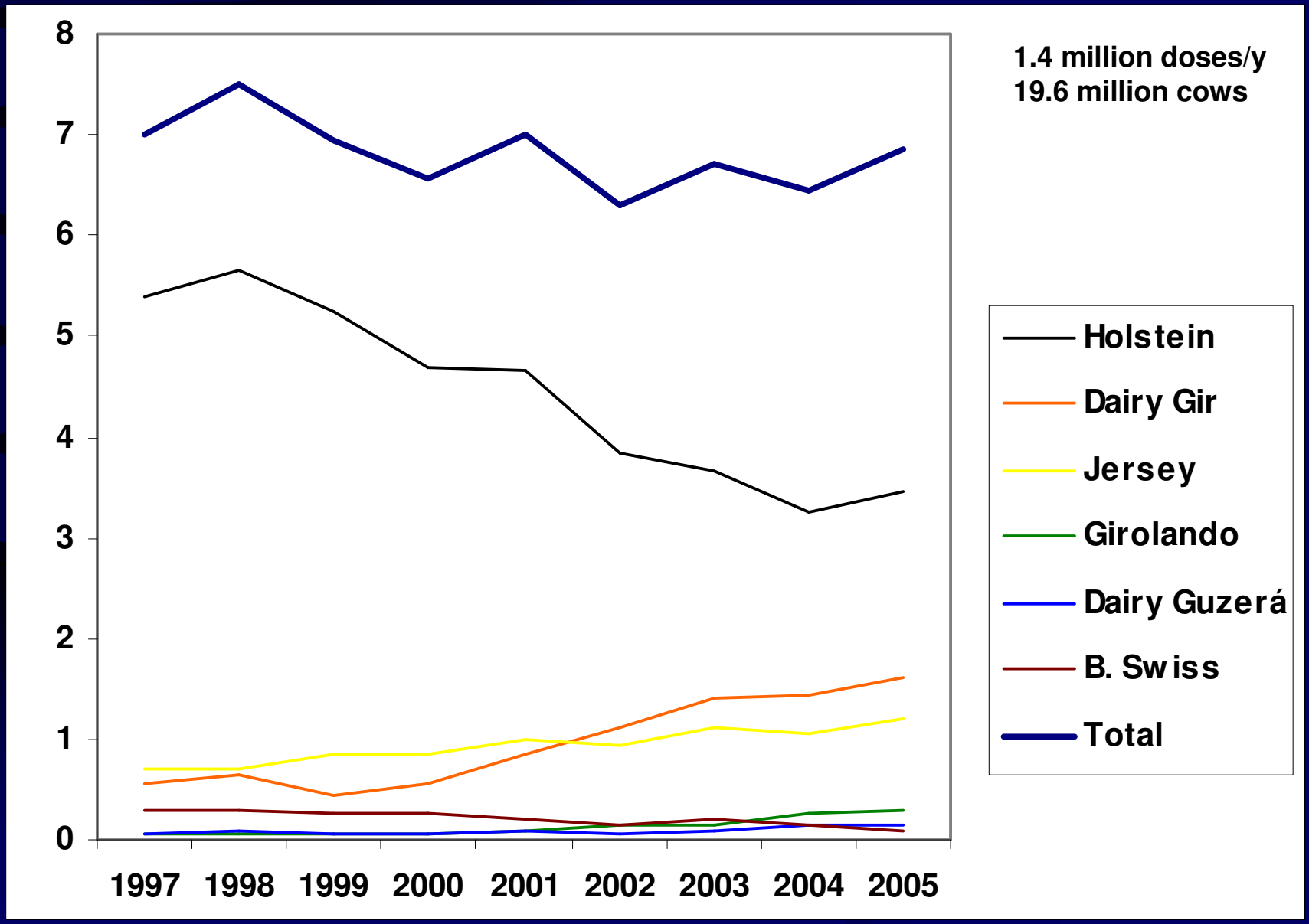
Bertrand et al. (1985)

	Lifetime performance 100(High-Avge)/Avge
Lifetime milk produced	+19
Feed cost	+10
Total profit/cow	+22
Semen cost	+49
Reproduction cost	+62
Health cost	+32
Mastitis cost	+54

How is it possible to increase profit while ruining the herd health and fertility in the process?

Low emphasis on traits affecting cost due to support subsidies?

Brazil –Semen dosis sold/(2 x number of dairy cows)



Concluding remarks

- Imported high-yield genetics introduced health and fertility problems
- Farmers (slowly) aware, resort to crossbreeding
- Vast, vested propaganda by vendors, unchallenged
- Much more research needed on alternative breeds and crosses

Obrigado!