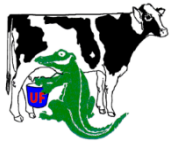
Towards sustainable cows, good herd practices, and quality dairy products in the USA

Albert De Vries

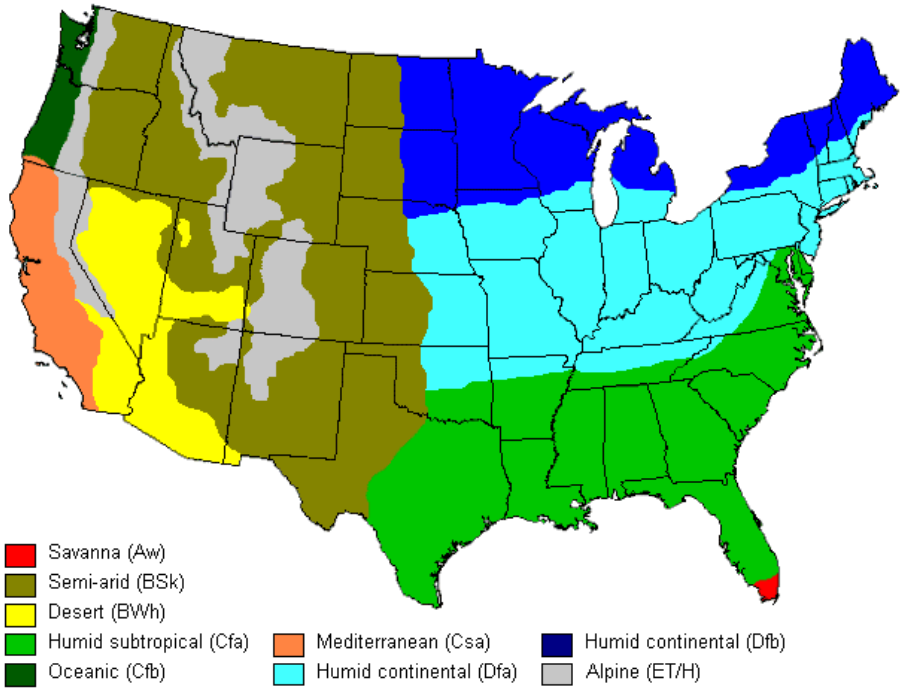
Department of Animal Sciences
University of Florida
Gainesville, Florida, USA
devries@ufl.edu

UF IFAS UNIVERSITY of FLORIDA



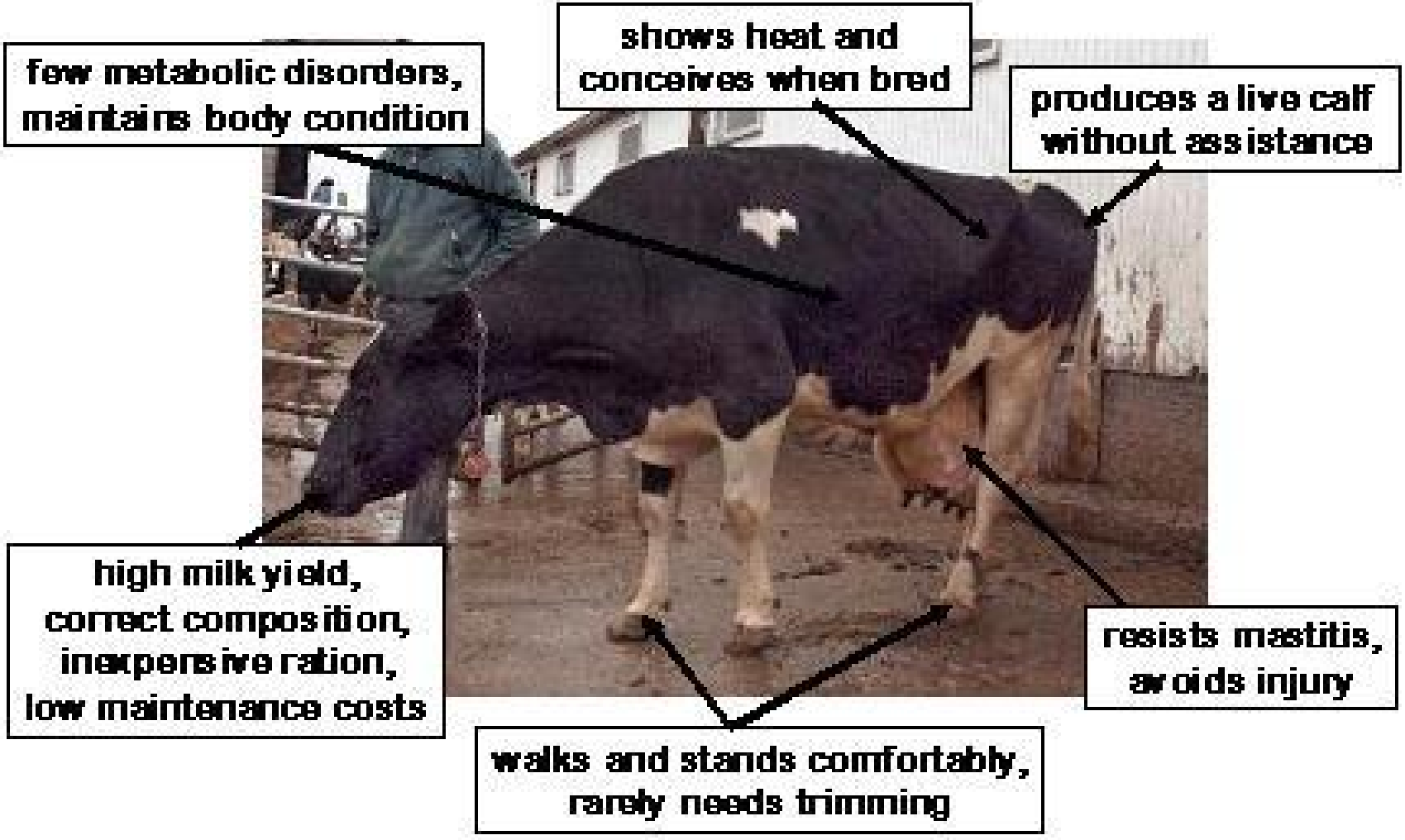
Session 20: "Sustainable Cows, Herd Practices and Product Quality", EAAP, Copenhagen, Denmark, August 25-29, 2014

Dairying in the USA is diverse



9 million dairy cows
45,000 dairy farms

The Perfect Cow



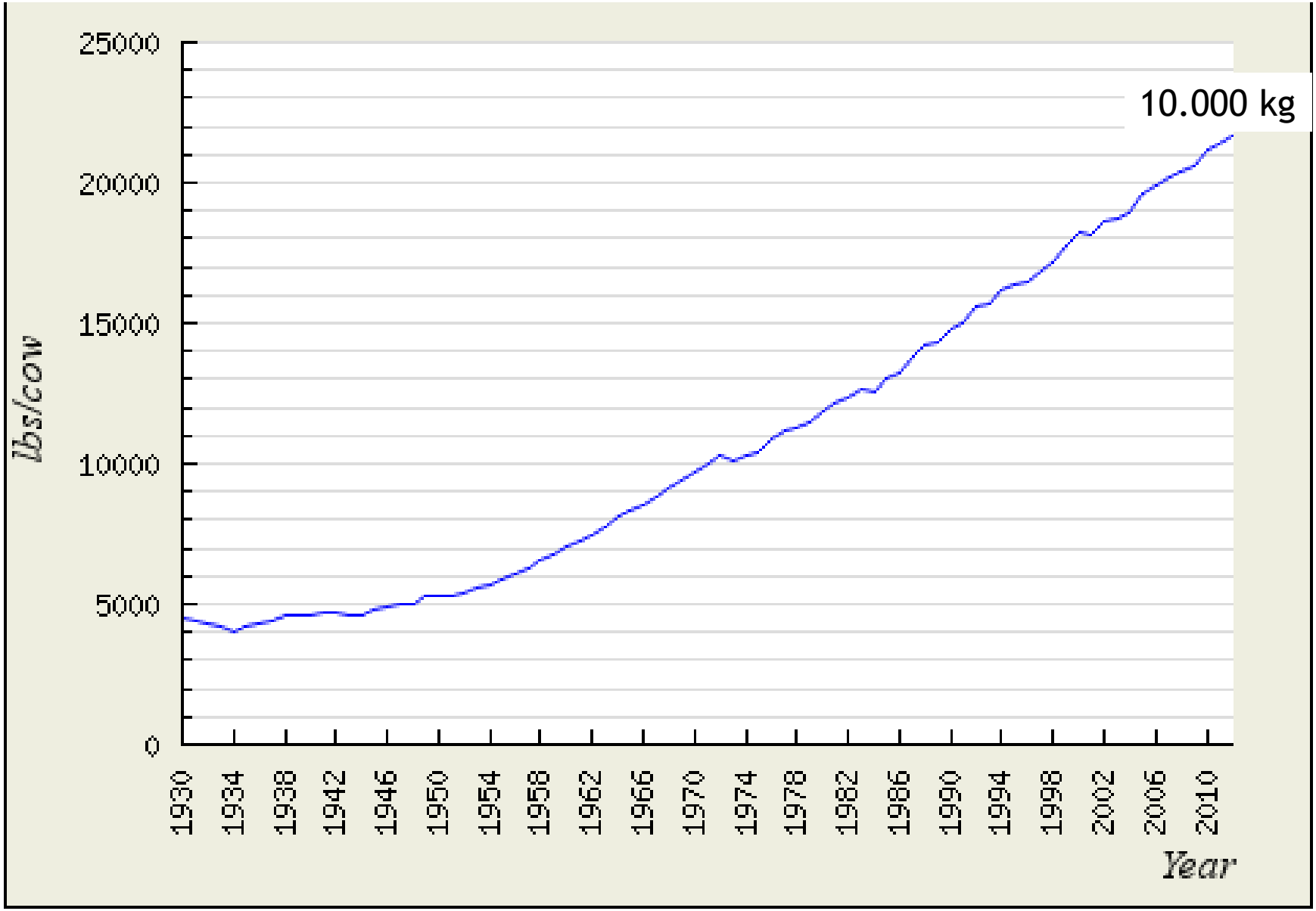
Kent Weigel, Univ. Wisconsin, http://www.extension.org/pages/Genetic_Improvement_of_Dairy_Cow_Longevity

Relative emphasis for selected USDA selection indexes

Σ = 100%

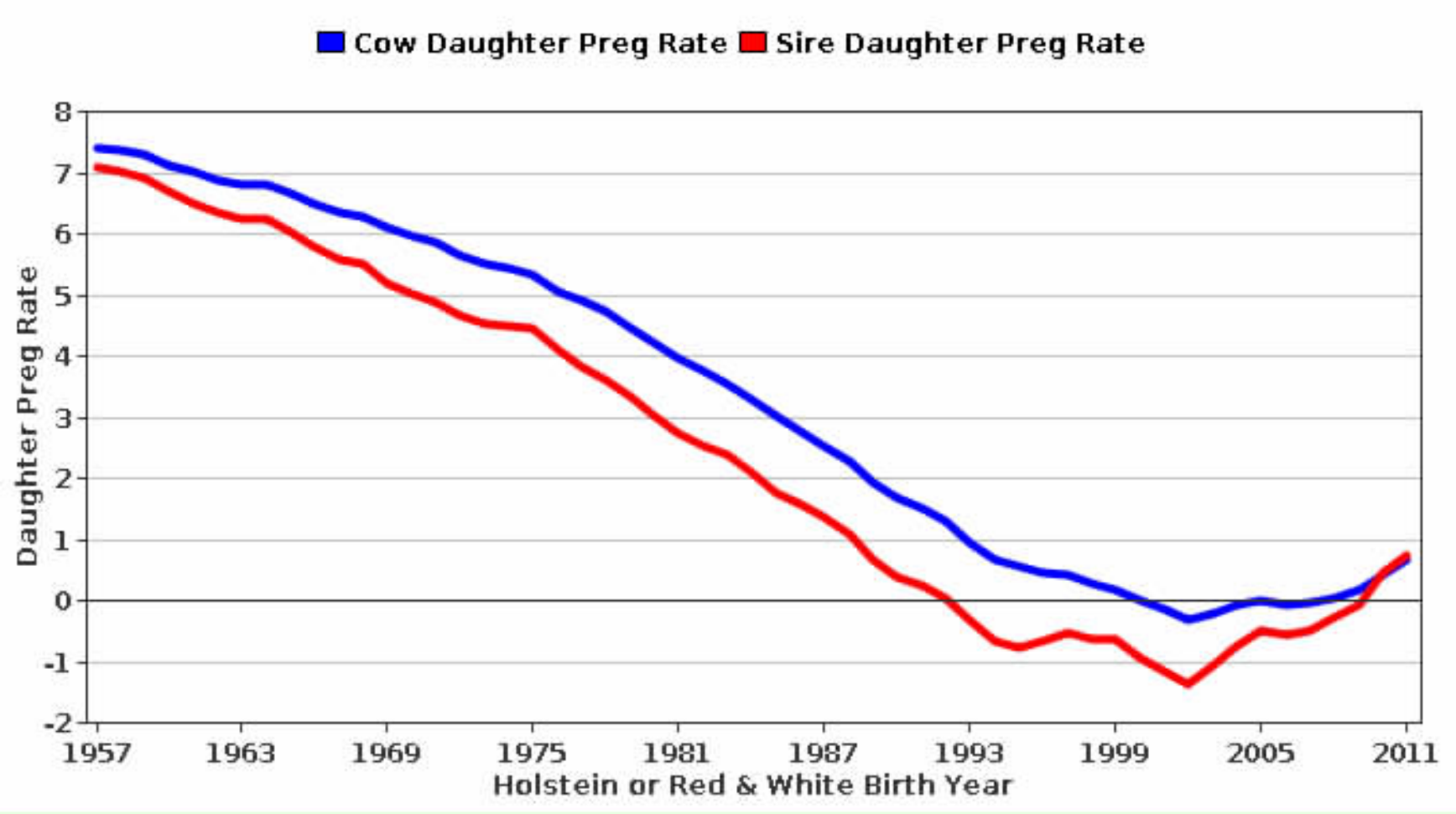
Trait	Selection index Year introduced	MF$ 1971	MFP$ 1976	NM$ 1994	NM$ 2000	NM$ 2003	NM$ 2006	NM$ 2010
Milk		52	27	6	5	0	0	0.001
Fat		48	46	25	21	22	23	19
Protein			27	43	36	33	23	16
Productive life				20	14	11	17	22
Somatic cell score				-6	-9	-9	-9	-10
Daughter pregnancy rate						7	9	11
Service sire calving ease						-2		
Daughter calving ease						-2		
Calving ability							6	5
Udder					7	7	6	7
Feet and legs					4	4	3	4
Body size					-4	-3	-4	-6

Average annual milk production per dairy cow (USA)



Source: future.aae.wisc.edu

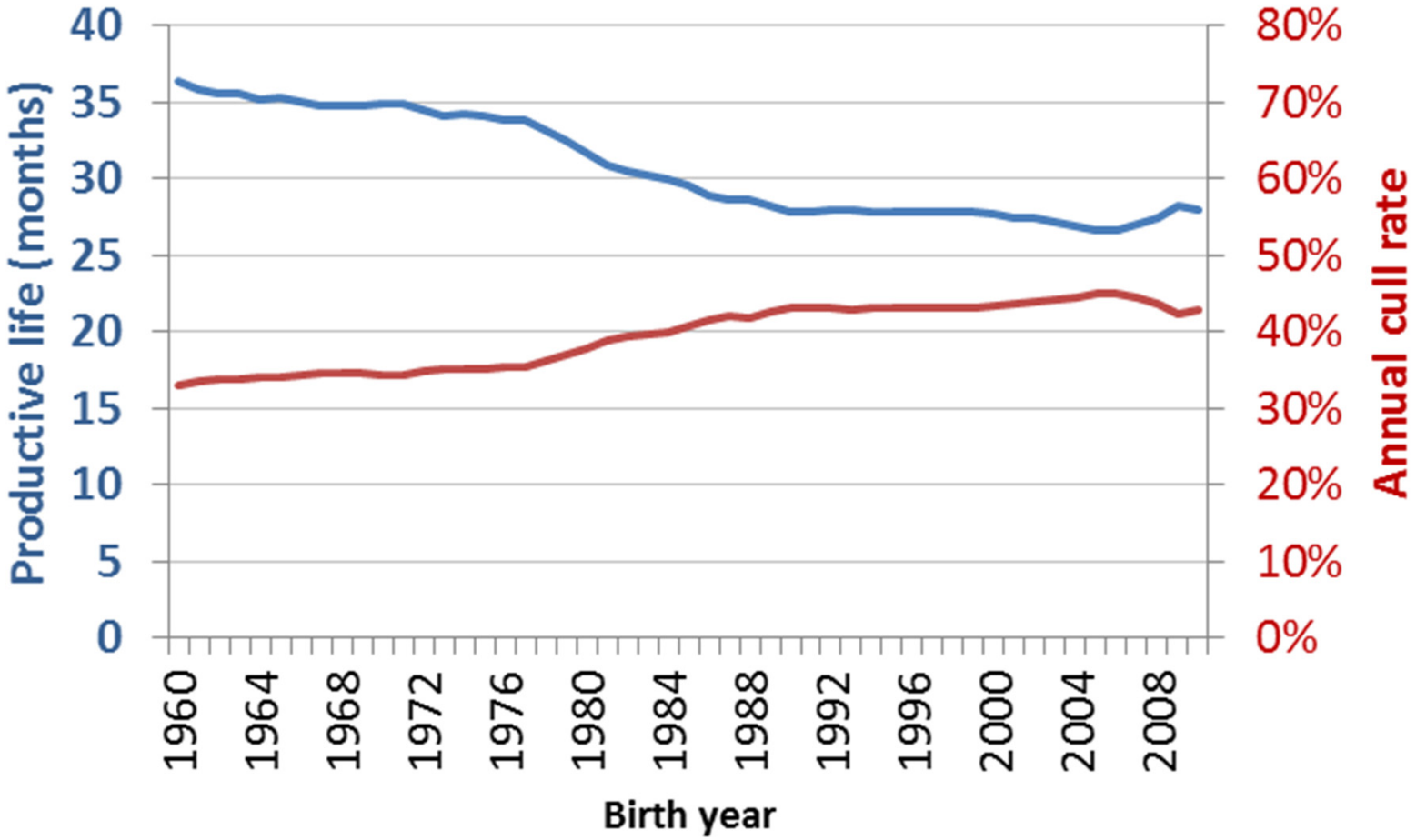
Reproduction is increasing again



Source: https://www.cdcb.us

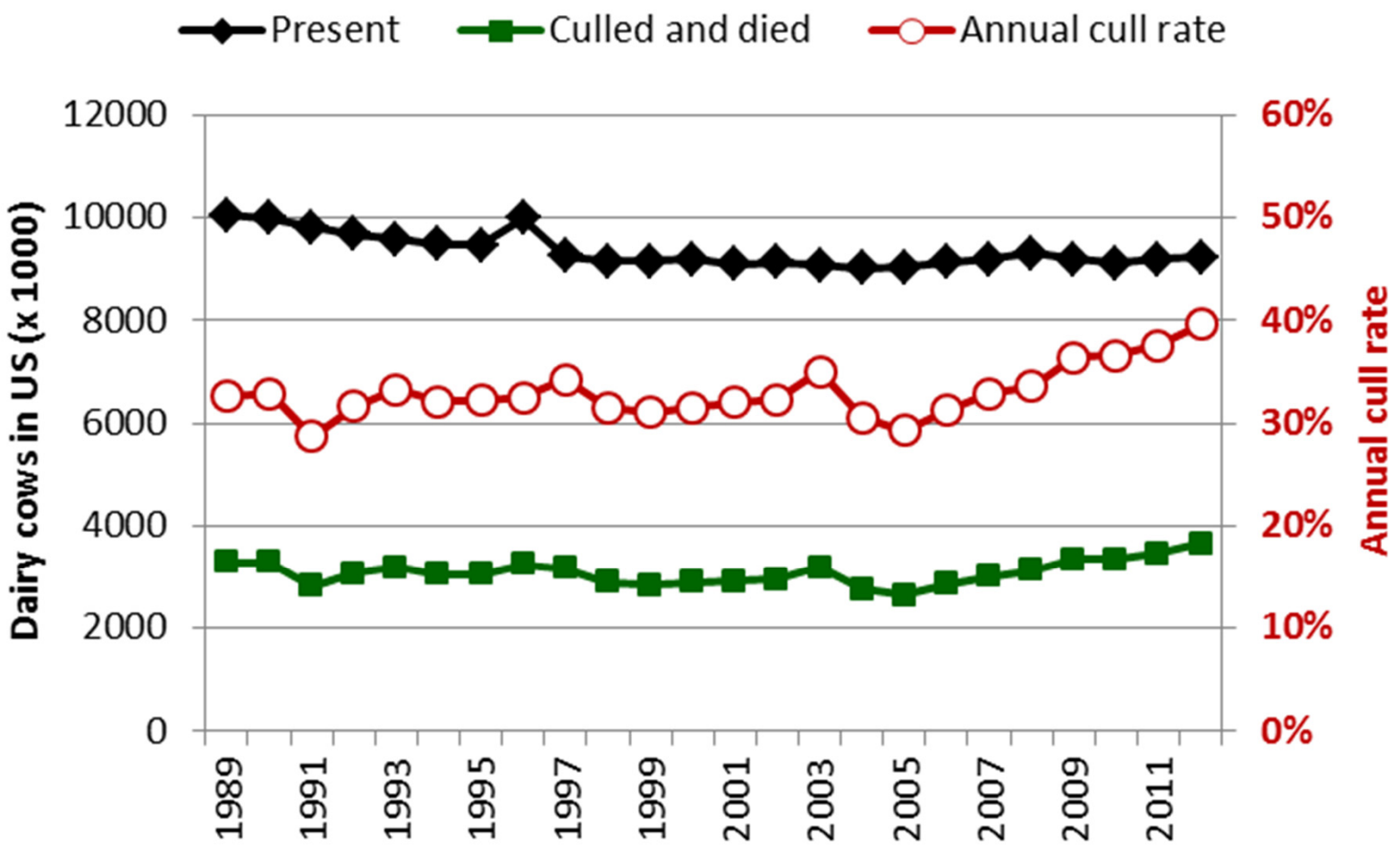
Trends in productive life 1960-2010

USA Holsteins + Red & White

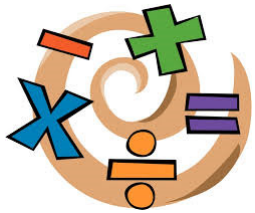


Source:http://aipl.arsusda.gov/eval/summary/trend.cfm?R_Menu=HO.h#StartBody

USA national dairy herd is constant at 9 million head



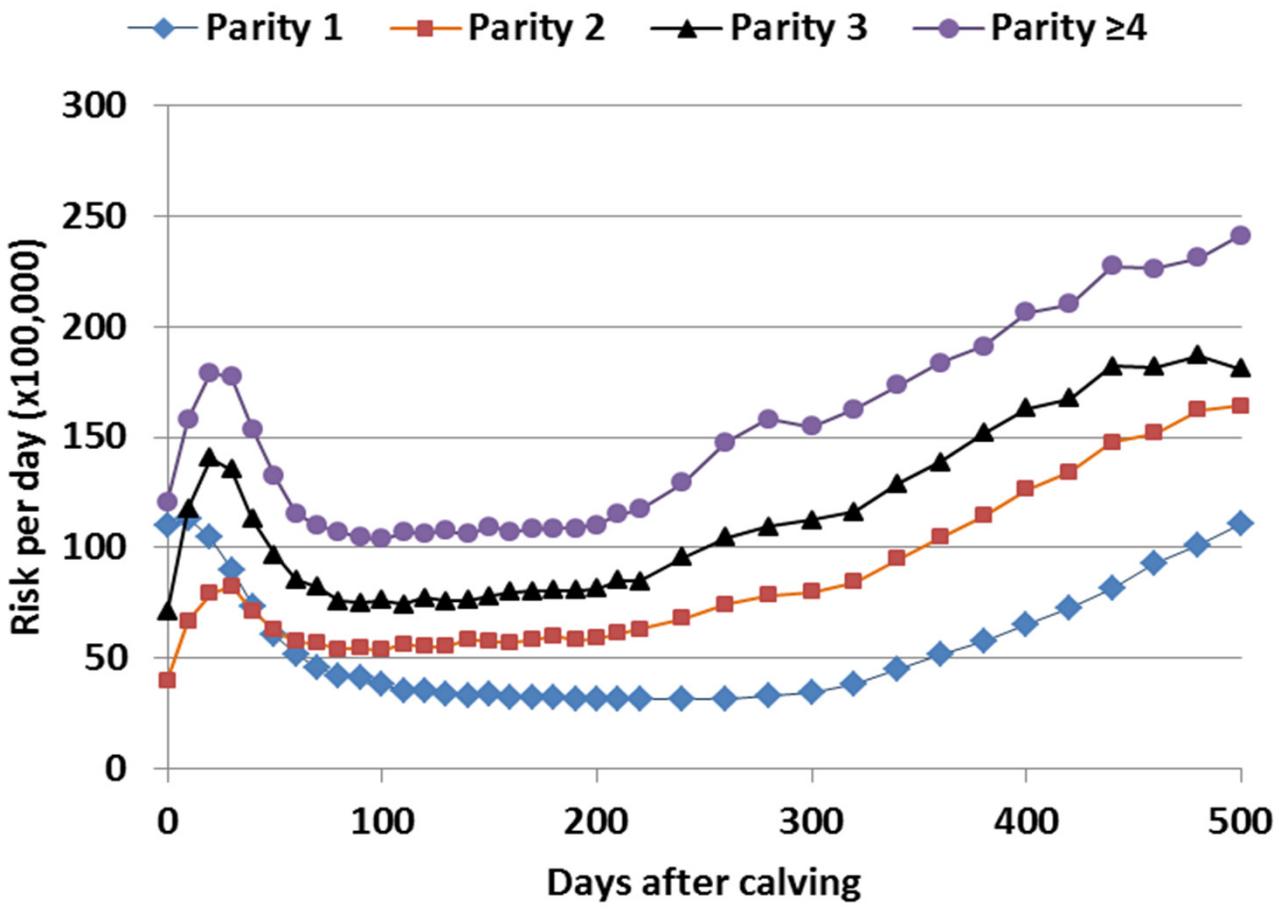
Culling mathematics



1. If national herd size is constant
2. If 1.0 to 1.1 calves born per cow per year
3. If all female calves are raised to become milking cows
4. Then national annual cull rate ≈35%
   - Productive life = 1/35%*12 = 34.3 months
   - Involuntary and voluntary culling
   - Cows are culled to make room for calving heifers

Risk of culling, non-pregnant cows

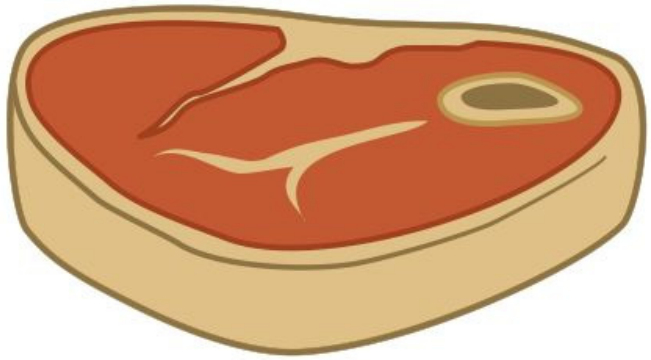
727 US herds > 100 cows (2001 - 2006)



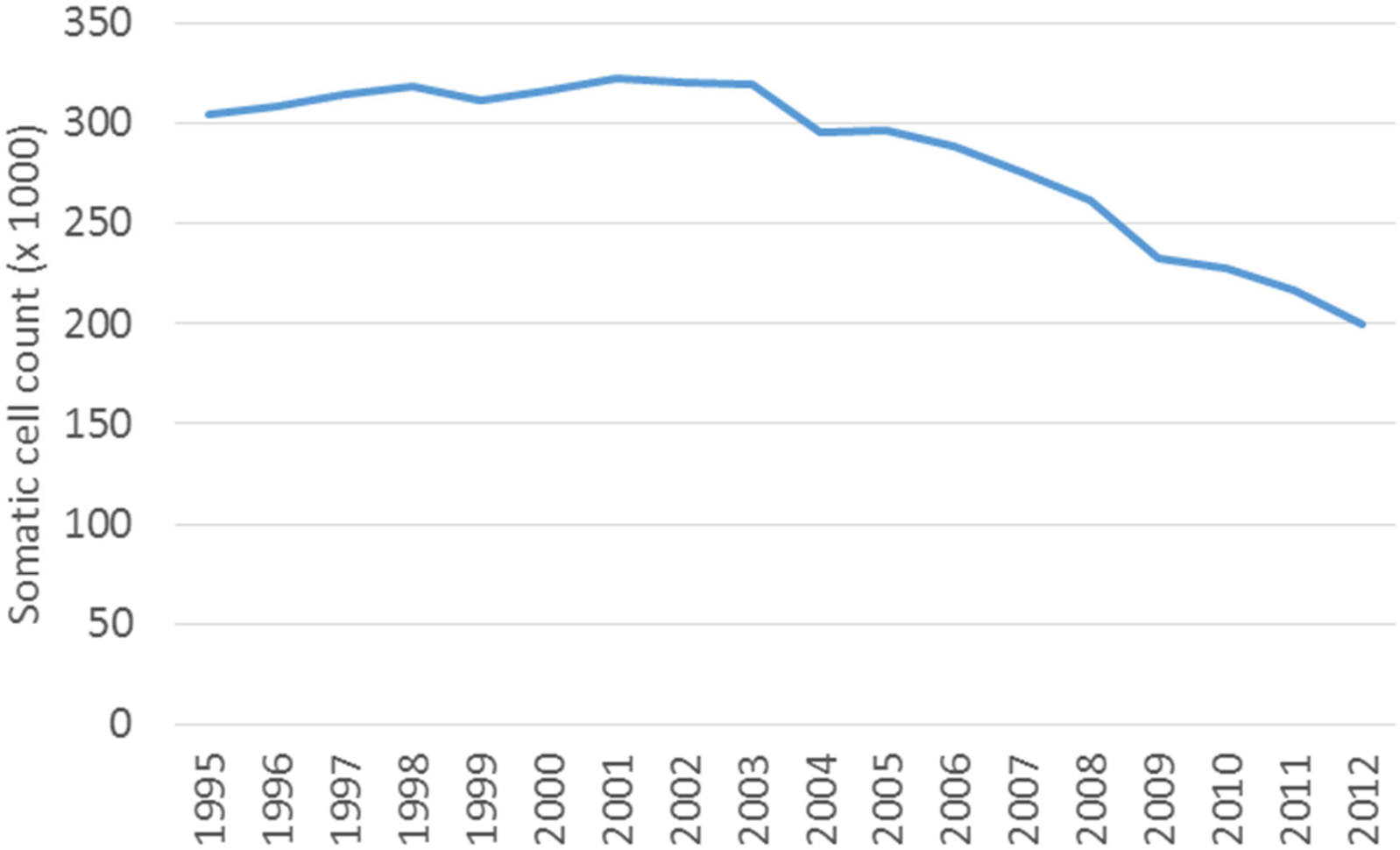
Pregnant cows risk:
= 25% of risk of open cows

De Vries et al. (2010). J. Dairy Sci. 93:613-623

Quality dairy products

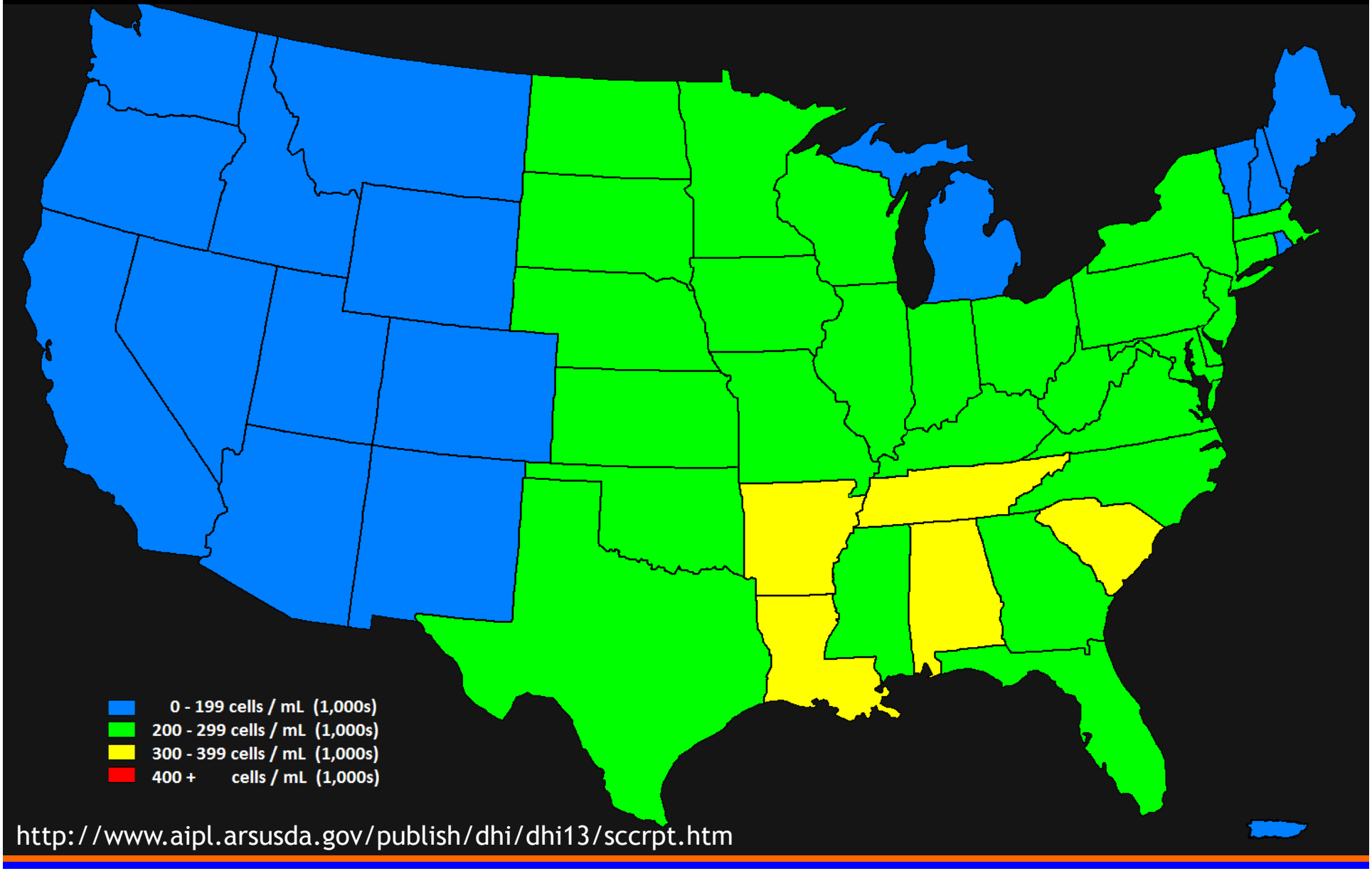


Somatic cell count decreases in DHIA herds



http://www.aipl.arsusda.gov/publish/dhi/dhi13/sccrpt.htm

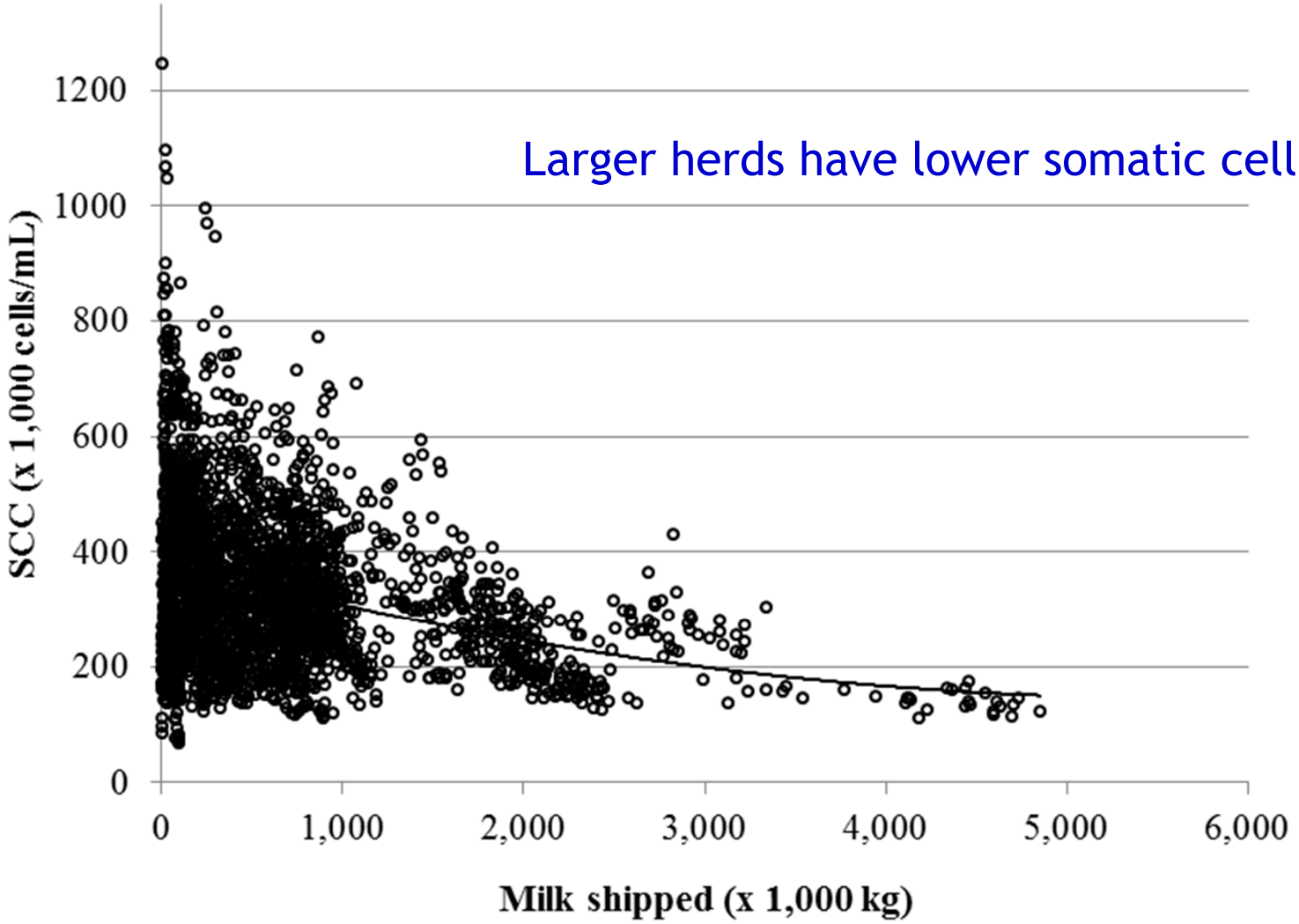
Average test-day somatic cell count from Dairy Herd Improvement herds during 2012 by State



http://www.aipl.arsusda.gov/publish/dhi/dhi13/sccrpt.htm

Monthly milk shipped and SCC

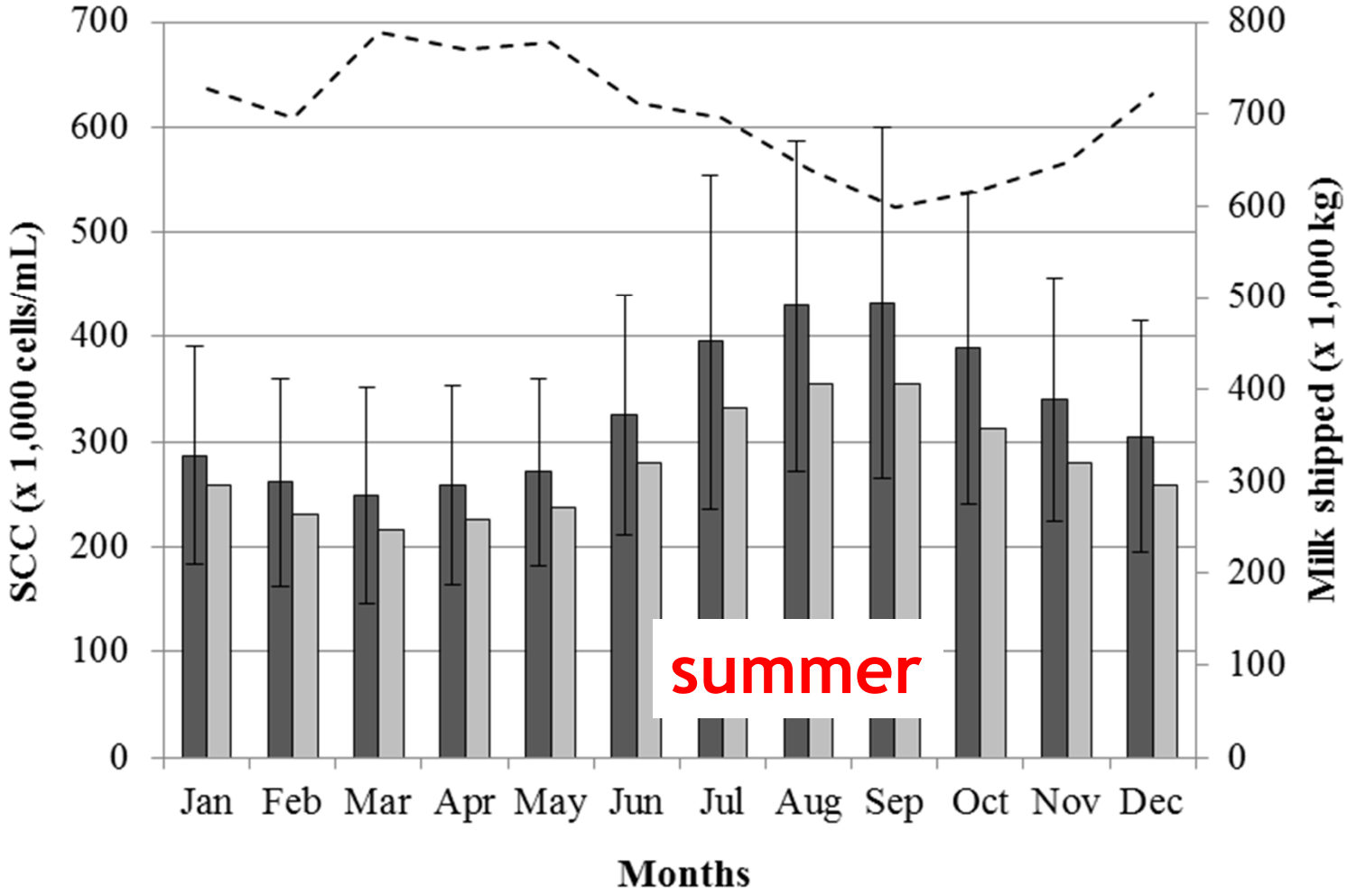
≈100 Florida dairy herds 2012+2013



Larger herds have lower somatic cell counts

Fereirra and De Vries, unpublished

Summers are challenging for milk yield and milk quality in Florida



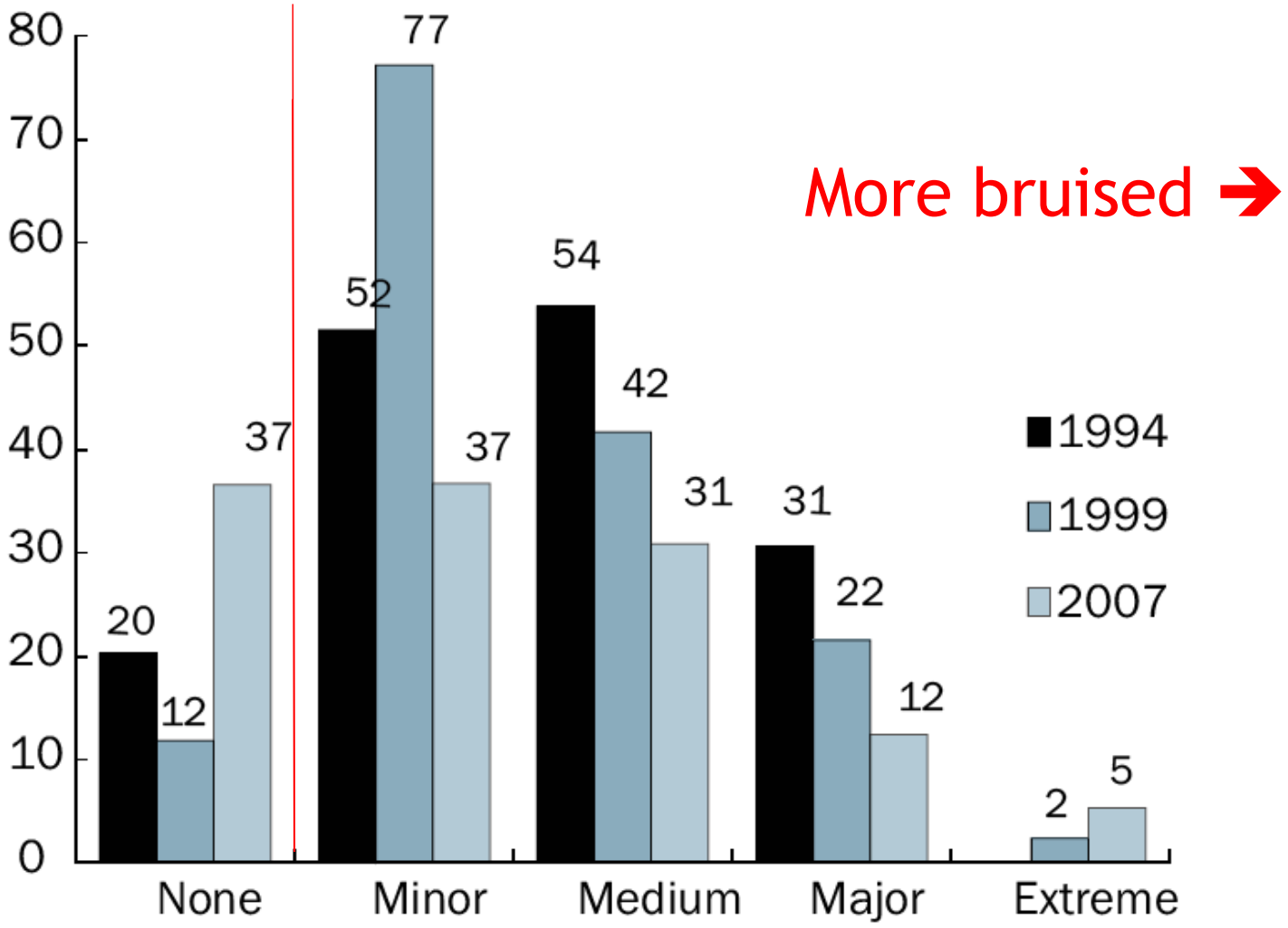
Fereirra and De Vries, unpublished

Dairy beef

- 10% of all processed cattle for meat are culled dairy cows:
  - 34,1 million cattle (2011)
  - 3 million dairy cows
- Cull cows are 5 to 15% of dairy farm revenues
- Often ignored

Bruising severity dairy cow culls

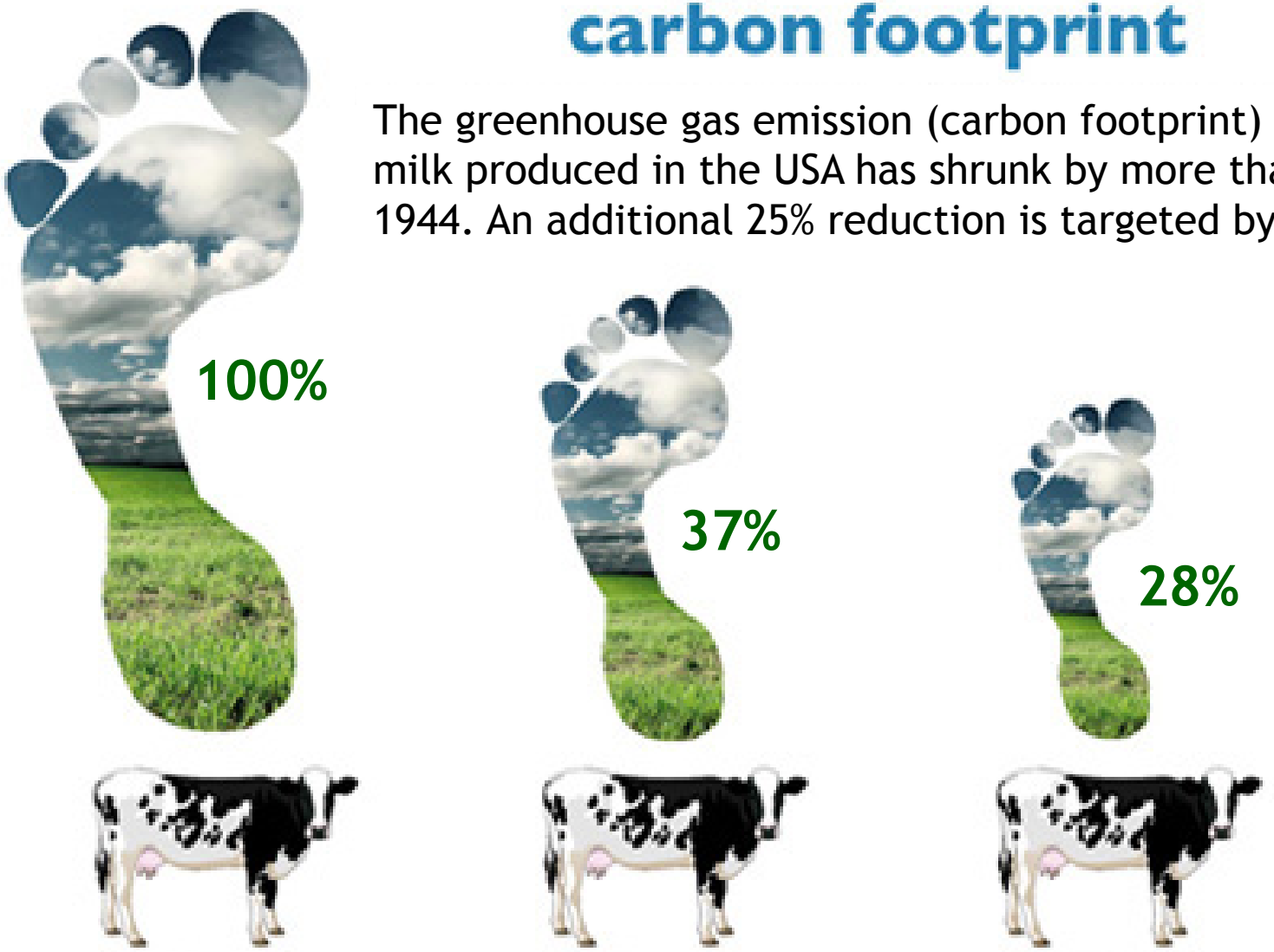
2007 National Market Cow and Bull Beef Quality Audit



http://www.bqa.org/cmdocs/bqa/2007auditdairy.pdf

Dairy's shrinking carbon footprint

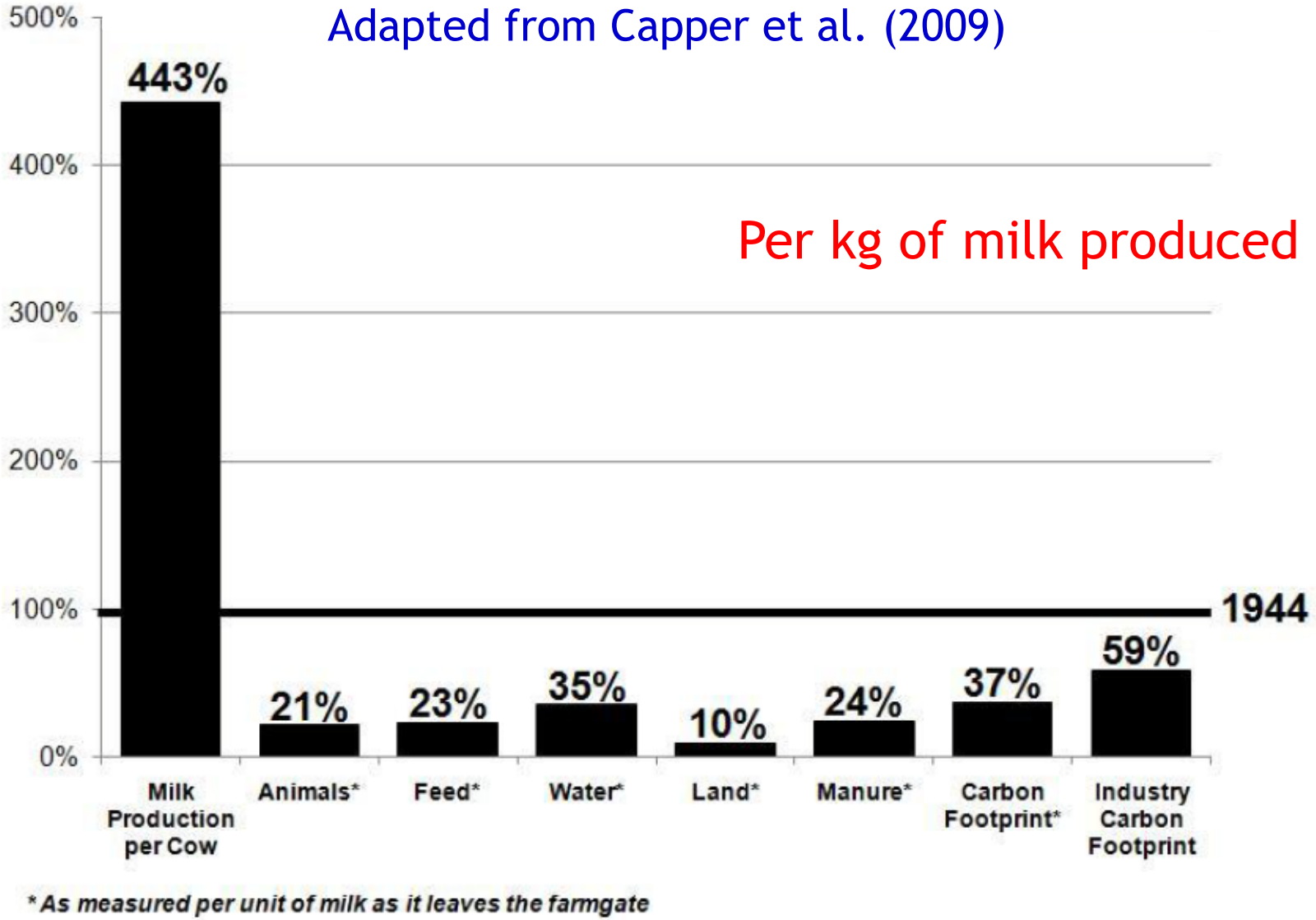
The greenhouse gas emission (carbon footprint) per unit of milk produced in the USA has shrunk by more than 63% since 1944. An additional 25% reduction is targeted by 2020.



Source: USDA, Innovation Center for US Dairy

US milk production, resource use and emissions in 2007 compared to 1944

Adapted from Capper et al. (2009)



http://dairy.ifas.ufl.edu/rns/2010/11-Bauman.pdf

How?

- Genetically improved cows
- Dairy science
  - Nutrition, reproduction, health care, cow comfort
- Employee training
  - Standard operating protocols
- Environmental regulations
- Freedom of enterprise, low economic margins
  - Only the adapters survive in the dairy business

Western USA

- Dry land
- Pump water
- Grow forages
- Milk cows
- Sustainable?

Summary

sustainable cows, good herd practices, and quality dairy products in the USA

- Genetics and management have greatly improved over the last decades.
- Cows live short for economic reasons.
- Milk quality is improving.
- Good herd practices are mostly driven by economics.

Thank you