

Feeding Dairy Cows for Longevity



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Losses of Cows from Herds

- ☑ Voluntary (selective) Culls
- ☑ Involuntary (non-selective) Culls
- ☑ Death Loss

Average Removal Rate

Godden et al., 2003

☑ 34%

- MN-DHIA records
- Reported as culled or died
- 718 Holstein herds
- Over 4 years of calvings

2002 USDA NAHMS Survey

- ☑ 76% of culls involuntary
 - 35% udder or mastitis problems
 - 35% reproductive problems
 - 25% lameness/injury

Death Losses

☑ USDA NAHMS Survey

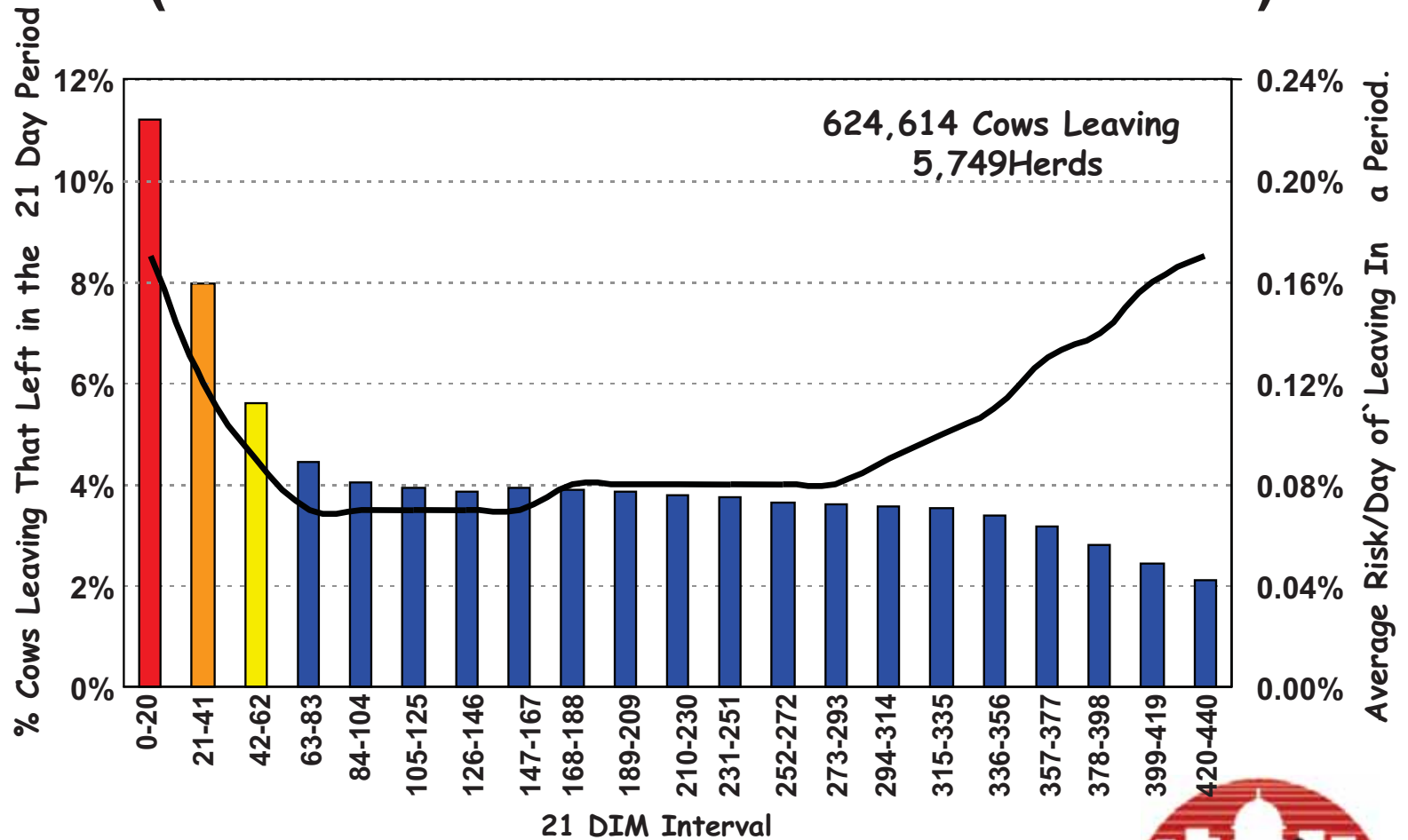
- 4.8%
- National average

☑ Stone et al., 2005

- 8.1% (3.5% to 16.8%)
- 20 New York herds with >12,000 cows



When Cows Leave the Herd (S. Stewart - MN DHIA 10/96 – 10/01)



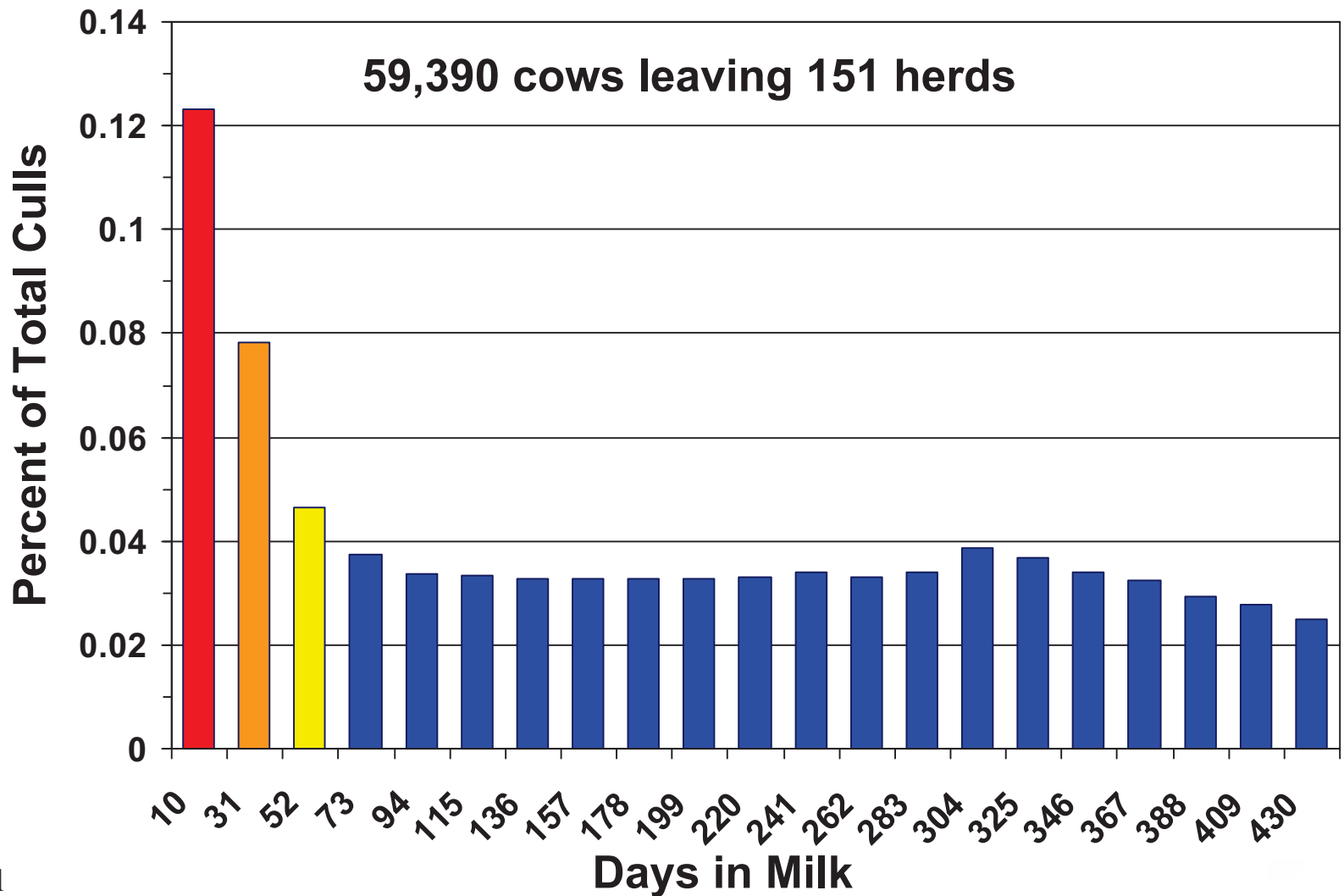
Data Source: Steve Stewart, U. of Minnesota





Culling Events by Days in Milk

(Calvings in 2001-2003 in Alta Genetics Advantage Herds)

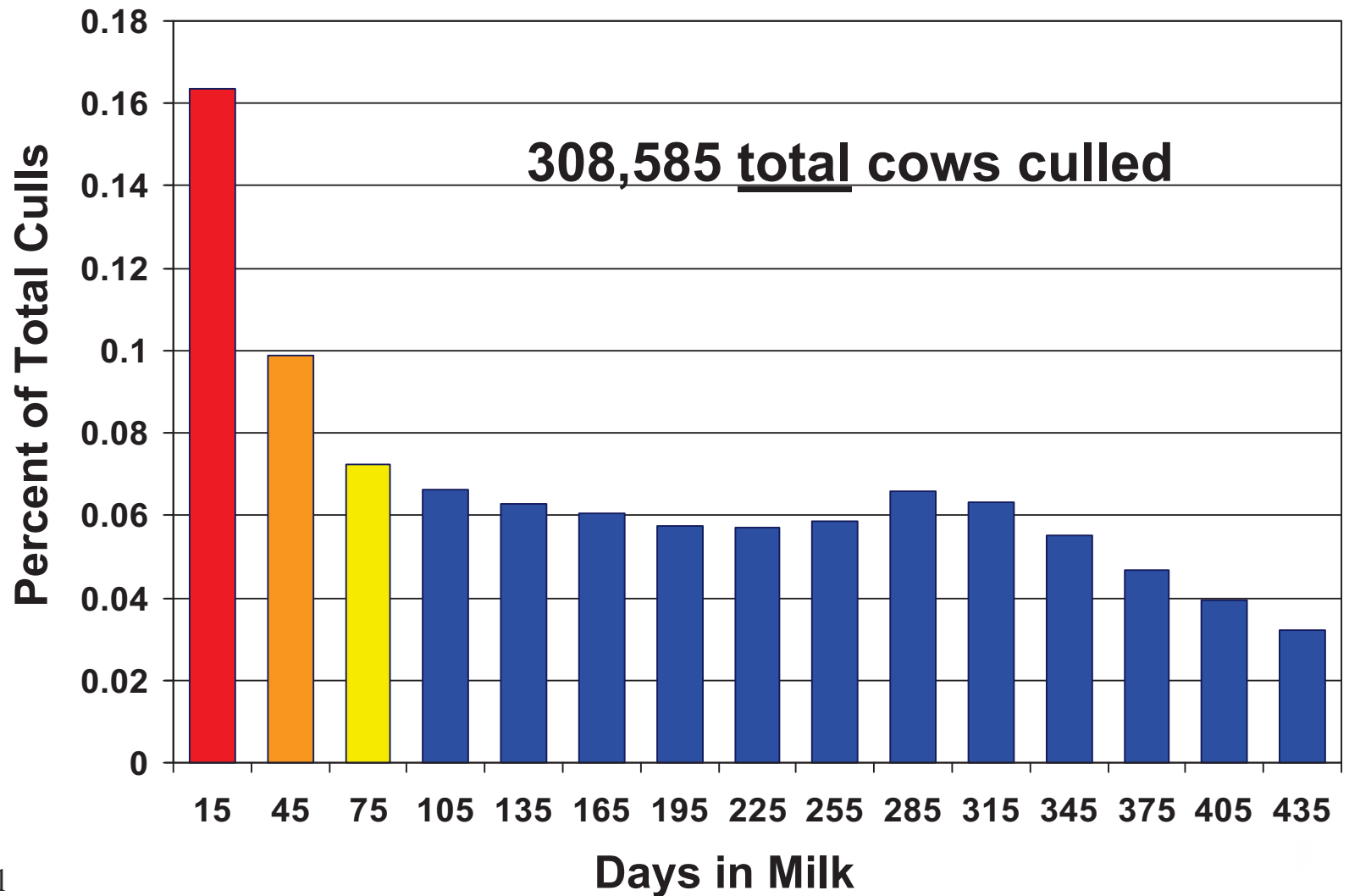




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Culling Events by Days in Milk

(Calvings from July 2003 to June 2004 in ATA herds)

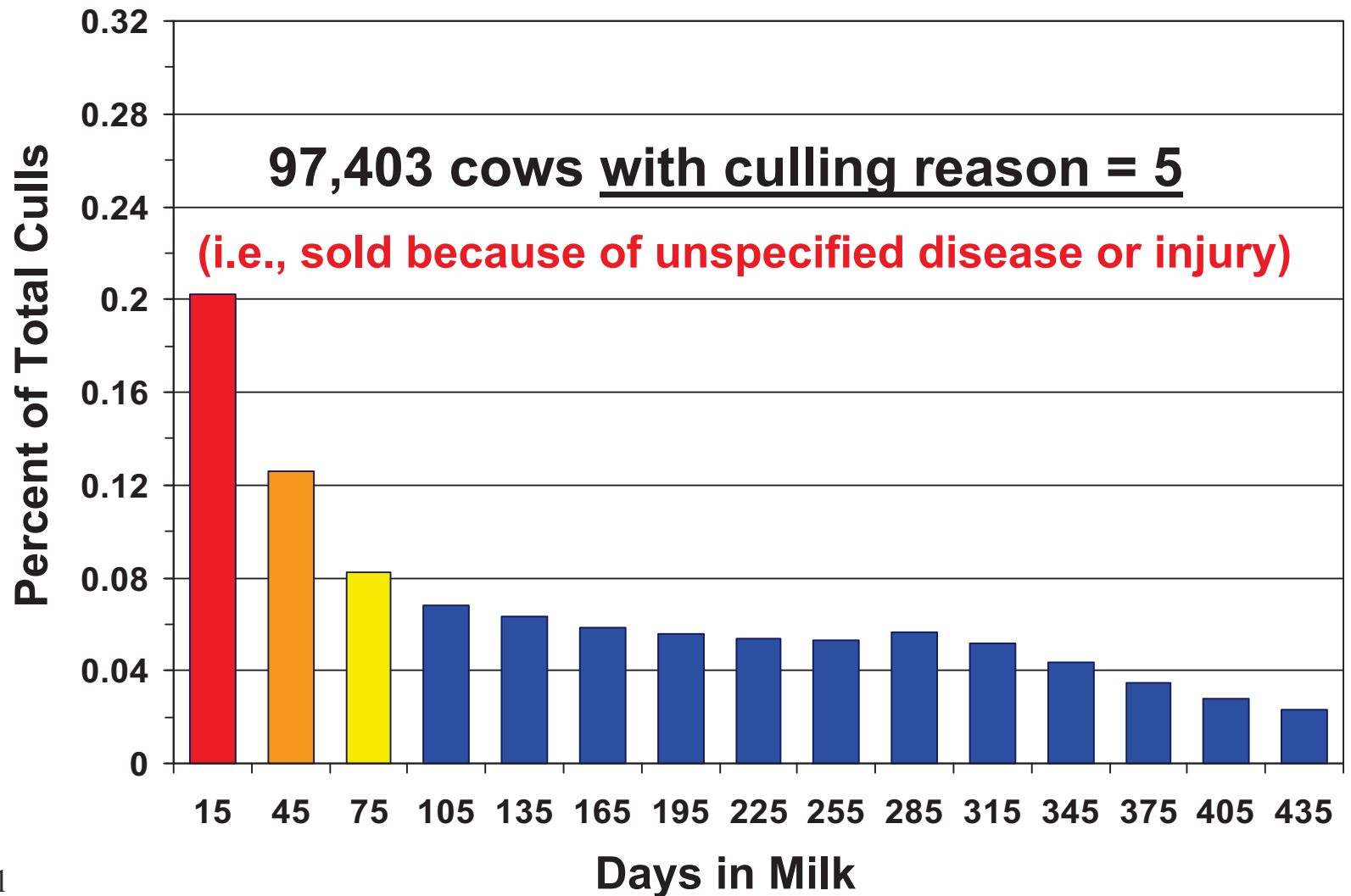


Source: Kent Weigel



Culling Events by Days in Milk

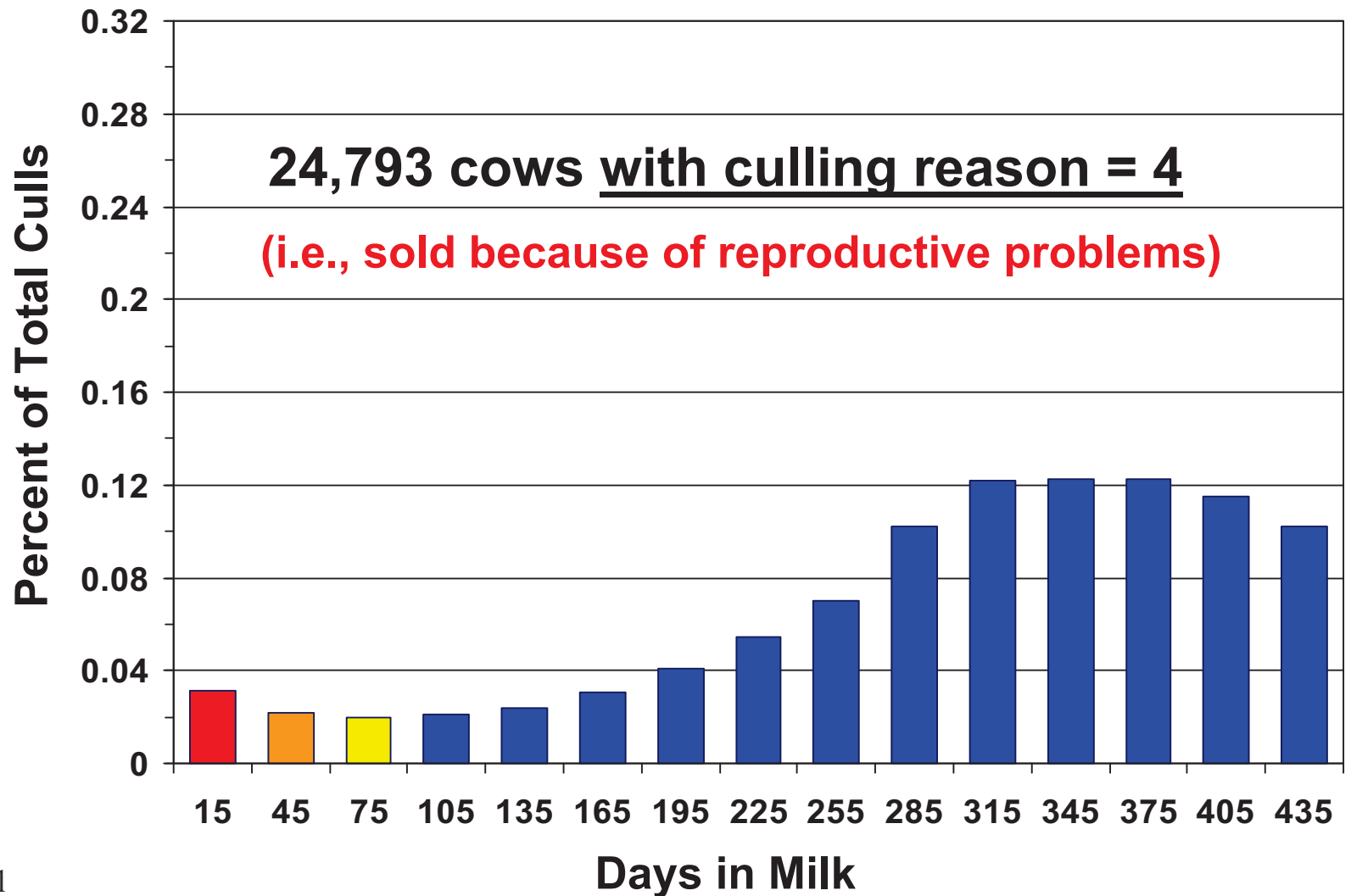
(Calvings from July 2003 to June 2004 in ATA herds)





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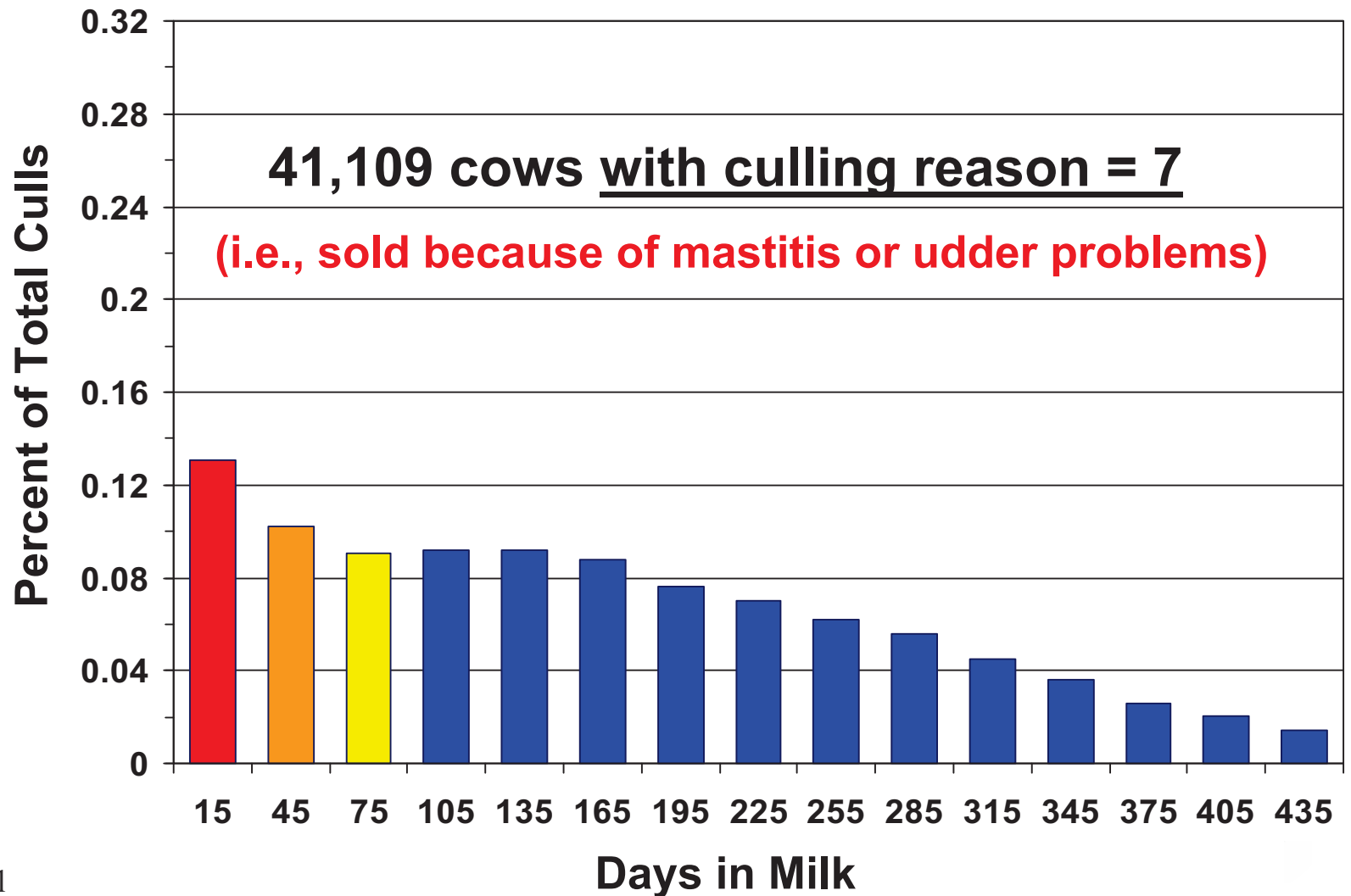
(Calvings from July 2003 to June 2004 in ATA herds)





Culling Events by Days in Milk

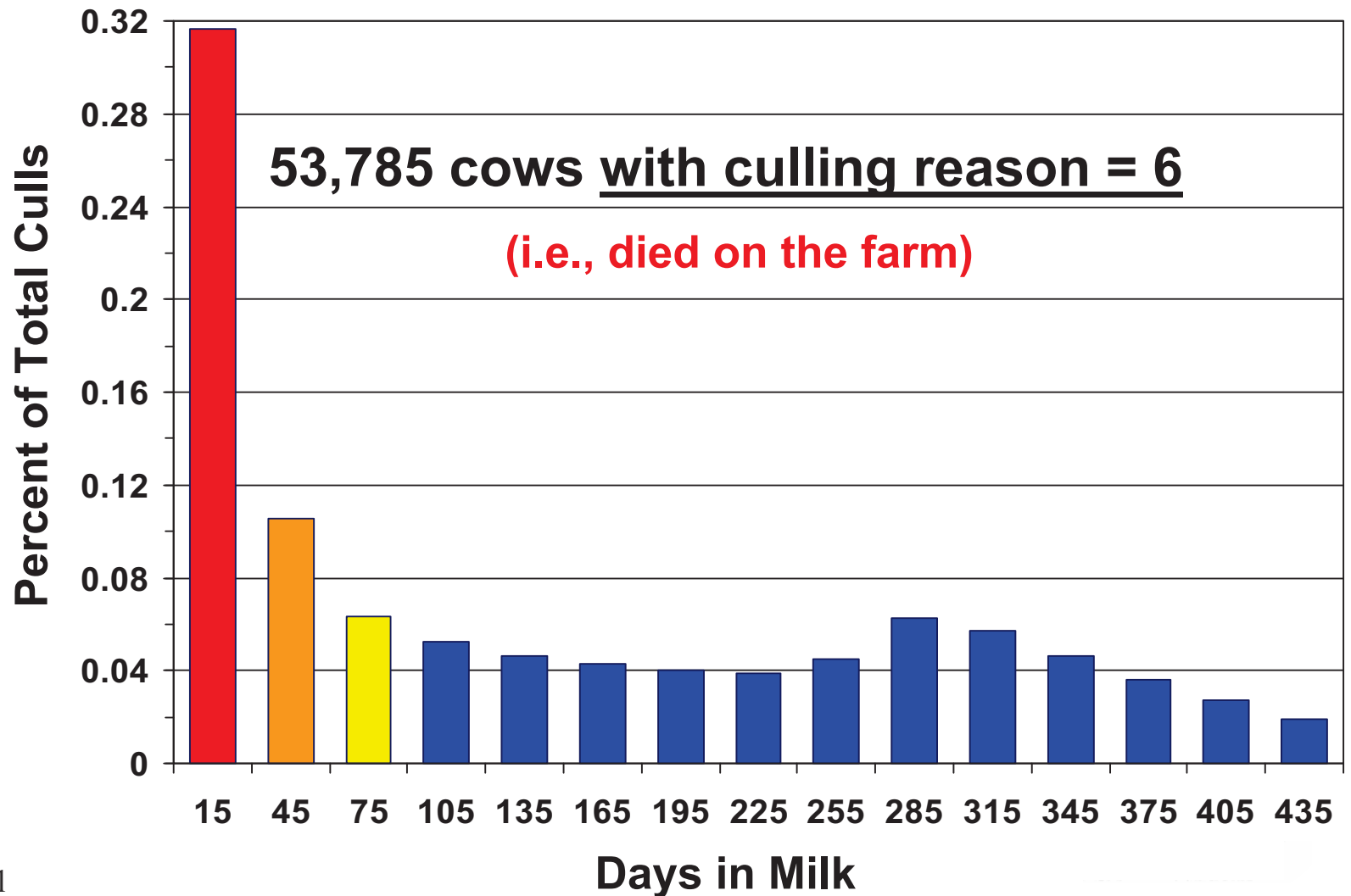
(Calvings from July 2003 to June 2004 in ATA herds)





Culling Events by Days in Milk

(Calvings from July 2003 to June 2004 in ATA herds)



Death Losses

Stone et al., 2005

☑ 10 New York herds with cause of death records

- 28% calving- or transition-related
- 10% mastitis related

Where to focus?

- ☑ **Calving/Transition-Related Culls or Deaths**
- ☑ **Mastitis-Related Culls or Deaths**
- ☑ **Reproductive-Related Culls or Deaths**
- ☑ **Lameness-Related Culls or Deaths**

Nutrition & Transition-Related Culls

Poor Transition Feeding and Management

- ❑ **Metabolic disorders** - milk fever, fatty liver, ketosis
- ❑ **Reproductive disorders** - RP & metritis
- ❑ **Digestive disorders** - SARA & DA
- ❑ **Rapid and excessive loss of BCS**
- ❑ **Low peak milk yields**
- ❑ **Poor fertility**
- ❑ **High veterinary costs**
- ❑ **High involuntary cull rates**

Transition Period

- ❑ 2 to 4 weeks pre-calving thru 2 to 4 weeks post
- ❑ Intake depression pre-calving
- ❑ Slow intake ascent post-calving
- ❑ Pre- & post-fresh feeding/management groups

Energy and Transition Cows

- ❑ 30% DMI decline pre-fresh
- ❑ Post-fresh DMI 20-30% below peak DMI
- ❑ Required energy for maintenance and pregnancy increases over last month pre-fresh
- ❑ Required energy for milk production increases abruptly after calving
- ❑ Mobilization of body fat
- ❑ Elevated NEFA & BHBA
- ❑ Elevated liver fat
- ❑ Elevated NEFA & BHBA risk factors for RP, ketosis, and DA

Energy and Transition Cows

☑ High Energy Intake

➤ DMI

- Feed quality
- Feeding management
- Cow management

➤ Diet Energy Density

- Feed quality
- Diet formulation
 - C:F ratio
 - Starch vs. Fiber Content
 - Starch & Fiber Digestibility

➤ Glucose Precursors

- PG, Ca-propionate, Sugar supplements

Rumensin® for Transition Cows

- ❑ **Reduced plasma NEFA & BHBA**
- ❑ **Reduced clinical & sub-clinical ketosis**

Other Transition-Cow Energy-Related Feed Additives

- ❑ **Rumen-protected choline**
- ❑ **Niacin**
- ❑ **Chromium** (unapproved)
- ❑ **Buffers** (post-fresh only)
- ❑ **Yeast products**
- ❑ **DFM's**

Preventing Sub-Clinical & Clinical Milk Fever

- **Low or negative DCAD pre-fresh**
 - **Restrict dietary K**
 - **Anionic salt products**

Transition Cow

Management x Nutrition Interactions

- ❑ **BCS at dry-off**
- ❑ **Dry period length**
- ❑ **Length of time on pre- & post-fresh diets**
- ❑ **Stall & bunk stocking densities**
- ❑ **Abrupt cow movement** (facilities or pens)
- ❑ **Feed mixing & delivery**
- ❑ **Feed quality**
- ❑ **etc., etc.**

Nutrition & Mastitis-Related Culls

Nutrition & Mastitis Control

- ❑ **Vitamin A, Beta-carotene**
- ❑ **Vitamin E**
- ❑ **Se**
- ❑ **Cu, Zn, Fe (excess), Mn**

Vitamin E supplementation and mastitis

Weiss and co-workers, JDS, 1997

	<u>100 IU</u>	<u>1000 IU</u>	<u>4000 IU</u>
IU E/d Dry	100	1000	1000
IU E/d Prefresh	100	1000	4000
IU E/d Postfresh	100	500	2000
Clinical Mastitis			
% of quarters	25.0	16.7	2.6

Nutrition & Reproductive-Related Culls

Body Condition at Calving

☑ **Target = 3.5**

☑ **4+ cows**

- ☐ > Intake depression prior to calving
- ☐ Poor appetites in early lactation
- ☐ More metabolic & digestive disorders
- ☐ Poor fertility

Effect of BCS change on reproduction

(Smith and co-workers, 1986)

<u>BCS loss</u> <u>5 wk PP</u>	<u>1st Serv.</u> <u>CR</u>	<u>Days to 1st</u> <u>Ovulation</u>	<u>Days to 1st</u> <u>Estrus</u>	<u>Days to</u> <u>Conception</u>
< .4	65%	27	48	73
.5-1.0	53%	31	41	90
>1.0	17%	42	62	116

Minimizing Rate & Extent of BW Loss

☑ High Energy Intake

➤ DMI

- Feed quality
- Feeding management
- Cow management

➤ Diet Energy Density

- Feed quality
- Diet formulation
 - C:F ratio
 - Starch vs. Fiber Content
 - Starch & Fiber Digestibility
 - Fat Supplements

Fat Supplements

- ☑ **Increase diet energy density and hopefully energy intake & energy balance**
- ☑ **Target specific fatty acids**
 - **EPA & DHA**
 - **Linoleic & linolenic acids**

Impact of High Herd/Group MUN

> 14 mg%

- ❑ Poor body condition
- ❑ **Poor fertility**
- ❑ Low milk protein %
- ❑ Excess N excretion

What dietary factors related to high MUN?

- ❑ High CP
- ❑ High RDP
- ❑ High RUP
- ❑ Low NFC
- ❑ Low Ruminant NFC Degradability

Selenium & Vitamin E

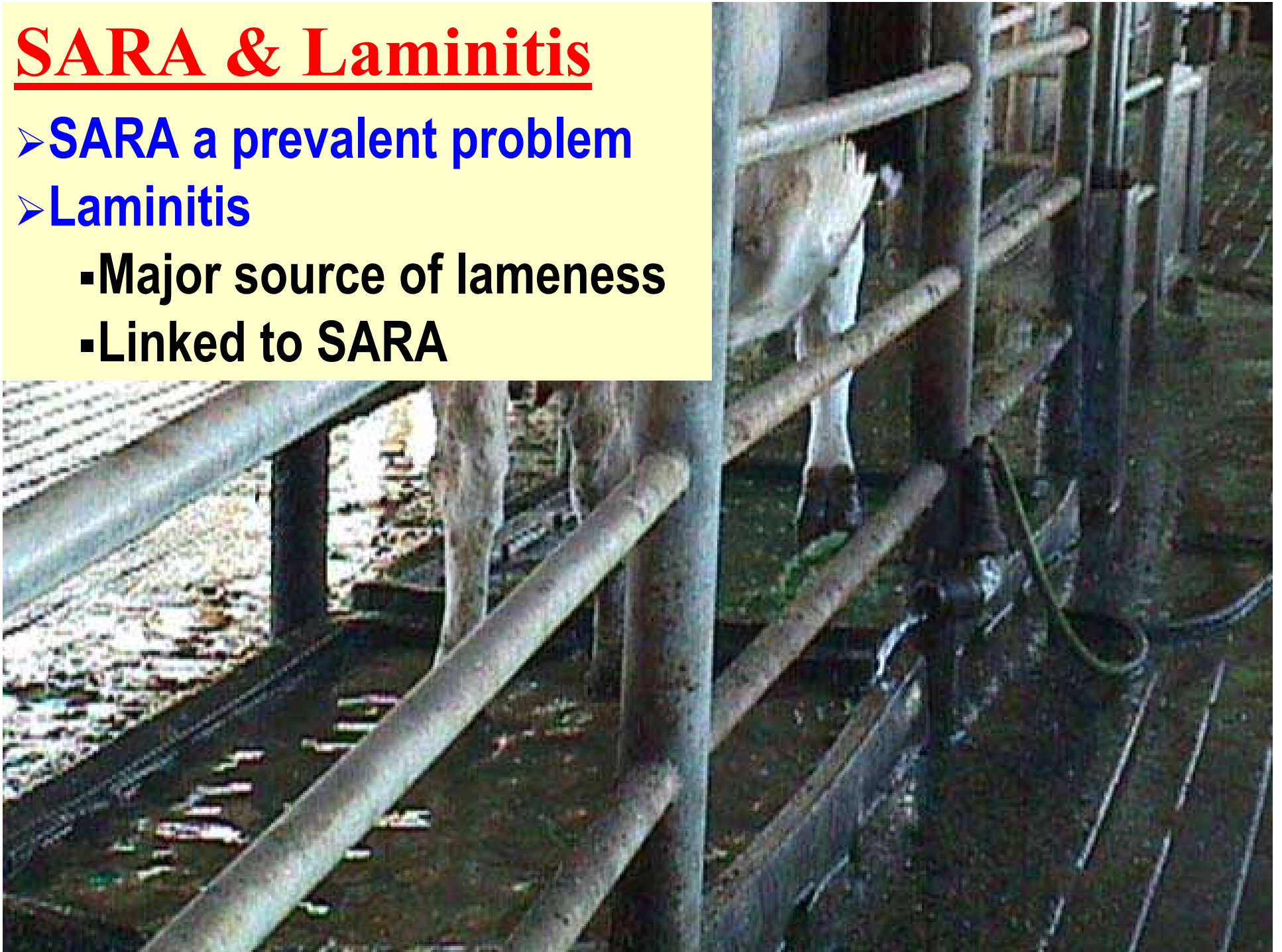
Harrison et al., 1984

- **Dry period supplementation**
 - <RP's
 - <Metritis
 - <Cystic Ovaries

Nutrition & Lameness-Related Culls

SARA & Laminitis

- SARA a prevalent problem
- Laminitis
 - Major source of lameness
 - Linked to SARA



SARA

Sub-Acute Rumen Acidosis

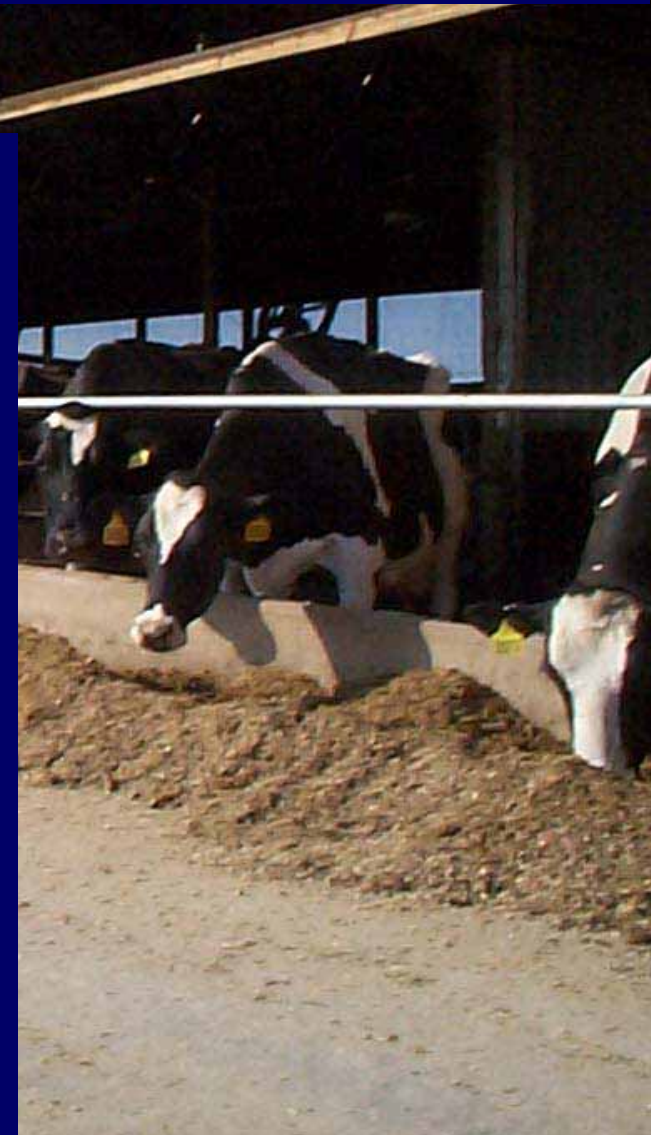
- >25% of cows sampled via rumenocentesis 4-8 hrs post TMR meal with pH < 5.5 (Nordlund, 2004)
- Ruminant pH function of (Allen, 1997)
 - VFA production from fermentation of CHO
 - VFA neutralization by salivary & dietary buffers
 - VFA removal by absorption or passage

Feeding Guidelines Aimed at Minimizing SARA

- ❑ **Diet NDF & ADF formulation minimums**
- ❑ **Diet forage & NDF-forage formulation minimums**
 - ❑ **TMR particle size distribution**
- ❑ **Diet peNDF formulation minimums**
- ❑ **NFC & starch formulation maximums**
 - ❑ **Grain particle size distribution**

Some Potential Errors in Feed Delivery & Bunk Management

- ❑ Feed sampling & analyses
- ❑ Ingredient dry matter adjustments
- ❑ TMR particle size
- ❑ Grain type, moisture, & processing
- ❑ Ingredient feeding rates
- ❑ Mixing errors & over-mixing
- ❑ Sorting
- ❑ Practices that promote slug feeding



Adverse Bunk Management Practices

- ❑ Limited bunk space (<1.5 ft. per cow)
- ❑ Limited feed access time (<16 - 20 h per day)
- ❑ Combination of above
- ❑ Combination of above with use of lock-ups
- ❑ Restricted feeding vs. feeding for refusal
- ❑ Inconsistent feeding schedule
- ❑ Infrequent TMR feeding or push-up
- ❑ Excessive bunk competition

Cow Comfort & SARA & Laminitis?



<u>Cow Comfort</u>	<u>SARA</u>	<u>Likelihood of Laminitis</u>
Good	Low	Low
Good	High	Moderate
Poor	Low	Moderate
Poor	High	High

Supplemental Dietary Biotin

➤ Improvements in hoof health at 20 mg/cow/d

- Reduced WLS (Midla et al., 1998; Hedges et al., 2001)
- Improved locomotion scores (Fitzgerald et al., 2000)
- Reduced sole ulcers (Bergsten et al., 2003)
- Improved sole ulcer healing (Licsher et al., 2002)

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<http://www.wisc.edu/dysci/>

