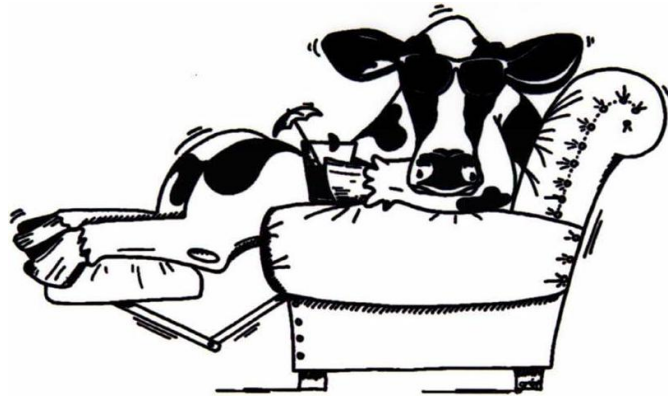


## **Top Off the Tank by Improving Cow Comfort**

Dan F. McFarland, Agricultural Engineering Educator



*“The best cow in the world could not do good work unless well cared for and rightly fed.”*

– W.D. Hoard, 1885

### **Measures of Milk Production**

- Pounds of milk per cow per day
- Pounds of milk per cow per lactation
- Pounds of milk per cow per lifetime

### **Cow Comfort = Bovine Stress Reduction**

#### **Stress Affects Cow Health, Productivity, and Well-Being**

- Immunity suppression
- Reduced growth
- Problems with milk ejection
- Lactation problems
- Reproductive problems
- Calving problems

#### **Sources of Bovine Stress Include:**

- Nutritional
- Excessive standing
- Heat stress
- Overcrowding
- Group shifting
- Illness & injury
- Filth
- Fear
- Lameness
- Rough handling

#### **Benefits of Reducing Bovine Stress Include:**

- Better milk production
- Better milk quality
- Better cow health
- Less lameness
- Better reproduction
- Improved longevity

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## Improving Cow Comfort in Facilities Can Improve Milk Production

Example A: New 120 cow freestall shelter

- Milk production increase of 8 pounds per cow per day.
- Decrease in SSC from 450K to 180K.

Example B: New 100 cow tie-stall barn

- Milk production increase of 10 pounds milk per cow per day.

Example C: Stall & ventilation improvements in 85 cow freestall shelter

- Milk production increase of 6 pounds of milk per cow per day.

## Typical Dairy Cow Behavior (Grant, 2006)

- ✓ Eating 3 to 5 hrs/day
- ✓ Resting 12 to 14 hrs/day
- ✓ Social Interactions 2 to 3 hrs/day
- ✓ Ruminating 7 to 10 hrs/day
- ✓ Drinking 0.5 hrs/day
- ✓ Outside Pen 2.5 to 3.5 hrs/day

## Activity of Dairy Herd 'Top 10%' and 'Average' Cows (Grant, 2006)

|                      | <u>Top 10%</u> | <u>Average</u> | <u>Difference</u> |
|----------------------|----------------|----------------|-------------------|
| ✓ Eating at manger   | 5.5 hrs/day    | 5.5 hrs/day    | 0.0 hrs/day       |
| ✓ Resting            | 14.1 hrs/day   | 11.8 hrs/day   | 2.3 hrs/day       |
| ✓ Standing in alleys | 1.1 hrs/day    | 2.2 hrs/day    | 1.1 hrs/day       |
| ✓ Perching in stalls | 0.5 hrs/day    | 1.4 hrs/day    | 0.9 hrs/day       |
| ✓ Drinking           | 0.3 hrs/day    | 0.4 hrs/day    | 0.1 hrs/day       |

*Each hour of resting time over 10 hours associated with 2.2 lb/day more milk.*

## Estimating the Impact of Cow Comfort

- ✓ Poor cow comfort affects dairy cattle and herd profits in several ways:
  - Reduced milk production per cow and less income over feed costs.
  - Poorer conception rates, longer calving intervals and more tail-end producers.
  - More involuntary culls, higher replacement costs and loss of valuable genetics.
  - Higher vet and medical costs.

## Longevity Improves Profitability

*"The average dairy cow spends 55% of her life as a heifer."* – J. Heinrichs, 2012

- ✓ Keeping a cow for just one more lactation
  - Extra milk production
  - One less replacement
  - Another calf
  - Reduced cull rate
  - Improved herd genetics

## Measuring Cow Comfort

### Locomotion Scoring

Score 1 – Normal

– Stands & walks normally with level back and makes long confident strides.

Score 2 - Mildly lame

– Stands with flat back, but arches when walking. Gait slightly abnormal.

Score 3 - Moderately lame

– Stands and walks with an arched back and short strides with one or more legs.

Score 4 – Lame

– Arched back standing and walking. Favors one or more limbs, but can still bear some weight on them.

Score 5 - Severely lame

– Pronounced arching of back. Reluctant to move with almost all weight transfer off the affected limb.

*Goal: 90% of herd with Locomotion Score of 1 or 2*

### Hock Assessment

Score = 1 – No swelling. No hair missing.

Score = 2 – No swelling. Bald area on the hock.

Score = 3 – Swelling is evident or there is a lesion through the hide.

*Goal: 95% or more with Score = 1, Less than 5% Score =2.*

### Hygiene Scoring

Assigns a cleanliness score to lower rear legs , udder, upper rear legs

Score 1 – Clean

Score 2 – Acceptable

Score 3 – Danger zone

Score 4 – Too dirty

*Goal: Greater than 90% Score 1 or 2*

### Stall Use Index

$SUI = (\text{Total Cows Resting in Stalls}) / (\text{Total Cows minus Cows Eating}) \times 100$

*Goal: >75%*

## The Cost of Compromising Cow Comfort

- ✓ Lost milk production
- ✓ Reduced milk quality
- ✓ Lameness
- ✓ Increased involuntary culling
- ✓ Reproductive problems
- ✓ Poor health

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