Lessons from 30 Years Working with Dairy Producers in Florida
Art Donovan, DVM, MSc, DiplABVP

Overview

• Background Exposure
• Heros and Mentors
• Evolution of the Dairy Industry & Lessons Learned
• Science and Pseudoscience
• Acknowledgements
Background Exposures

- Milking cows in high school & early college years

Background Exposures

- Nova Scotia Agricultural College
Background Exposures
• Ontario Veterinary College – Guelph, Ontario

Heros and Mentors
• Heros

Dad & Mom

Patti
Heros and Mentors

- Mentors
  - Bob Curtis
  - The Kens!
    - Ken Leslie
    - Ken Braun

My Philosophy - Dairy Veterinarian

- Stop  Look  Listen

  - “More things are missed for not looking than for not knowing!”

  Drs Francis Fox & Ken Braun
The ‘Germ Theory of Disease’

• Many diseases are caused by microorganisms.
• Organized the science of diseases
  – Disease causation
  – Vaccinology
  – Sanitation
  – Pasteurization
  – Epidemiology

Louis Pasteur

Do I subscribe to the ‘Germ Theory of Disease’?

• It depends!
• On the organism / disease
Lessons Learned

• Florida Dairy Industry 1980 - now

<table>
<thead>
<tr>
<th>Year</th>
<th># Herds</th>
<th># Cows</th>
<th>RHA Milk</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>456</td>
<td>187,000</td>
<td>10,845</td>
</tr>
<tr>
<td>1990</td>
<td>300</td>
<td>180,000</td>
<td>14,044</td>
</tr>
<tr>
<td>2000</td>
<td>217</td>
<td>157,000</td>
<td>15,688</td>
</tr>
<tr>
<td>2010</td>
<td>140</td>
<td>114,000</td>
<td>16,324</td>
</tr>
<tr>
<td>2015</td>
<td>127</td>
<td>123,000</td>
<td>19,374</td>
</tr>
<tr>
<td>2017</td>
<td>122</td>
<td>121,000</td>
<td>19,638</td>
</tr>
</tbody>
</table>
Evolution of Dairies in Florida 1980-2017

• Diseases

• Facilities

• Feeding

Evolution of ‘Diseases’ in Florida 1980-2017

• Brucellosis
• IBR
• Heel warts
• Otitis media (‘Ear infections’)
• Bloody gut
• Mastitis
Evolution of ‘Diseases’ in Florida 1980-2017

• Brucellosis
  – 1980 - The scourge of the cattle industries in Florida
  – Test-and-Slaughter
  – Enter Dr. Paul Nicoletti
    – First-rate scientist
    – Ex-USDA employee
    – Rallied stakeholders
    – Stood up to politicians
    – Stubborn as hell!
    – Wouldn’t take ‘No’ for an answer

  “This is a controllable infectious disease propagated by politicians!”

• IBR
  – Lots of ‘shipped in’ replacement heifers
  – Lots of respiratory disease, abortions
  – In steps Dr. Ken Braun
    – Vaccinatable disease
    – Solidified replacement rearing programs → ↓ in imported animals
    – Nutrition, nutrition, nutrition!
Evolution of ‘Diseases’ in Florida 1980-2017

• Heel warts – mid to late 1980s
  – Severe acute foot rot that did not respond to traditional antibiotic therapy
  – Treats tried
    – Cautery – Yes, we applied a hot dehorning iron in these lesions!
    – Topical antibiotics – varying success (due to environmental conditions?)
    – Topical formalin gel
  – Enter Dr. Jan Shearer
    – Hoof spraying with tetracycline
    – Formaldehyde foot baths
    – Any foot baths

• Otitis media (‘Ear infections’)
  – “What da heck is this!”
  – Early observations – trauma? ‘Hit by milk truck’
  – Parasites (ticks / mites)
Evolution of ‘Diseases’ in Florida 1980-2017

• Otitis media (‘Ear infections’)
  – Gina Temple, Jack Gaskins, Mary Brown
  – Caused by *Mycoplasma bovis*
  – Transmission – Predominantly through milk
  – Early clinical signs – Fever, head-shaking, ear-scratching
  – Treatment – Anything but the penicillins/cephalosporins and sulfas
  – Prevention – Avoid milk exposure, ventilation, nutrition, sanitation

Evolution of ‘Diseases’ in Florida 1980-2017

• Bloody gut
  – 1998 – ‘Dead cow syndrome’
  – Crash in milk followed by death

• Bloody gut
  – Followed 10 cows through a slaughter facility
  – Lung abscesses, hardware disease?
  – Lung abscesses, pneumonia
  – Resulting from bacterial escape from the small intestine after an episode of BG
Evolution of ‘Diseases’ in Florida 1980-2017

- **Bloody gut**
  - Earlier detection
  - Surgical treatment
  - Medical treatment
  - Cause
  - Prevention

Evolution of ‘Diseases’ in Florida 1980-2017

- **Mastitis**
  - 1980s – I’d go to meetings and get laughed at by other veterinarians
  - Milk quality was keeping milk ‘legal’
Evolution of ‘Diseases’ in Florida 1980-2017

• **Mastitis**
  – 1980s – I’d go to meetings and get laughed at by other veterinarians
  – Milk quality was keeping milk ‘legal’
  – Milker schools, Parlor Checks (milking machine function), Cultures

  ![Time spent in parlor vs time spent in barns/pasture]

  ![5-6 min 2-3x/d vs ‘the rest of the day’]

“We’ve got to move out of 1940s level of management.”

• **Mastitis**
  – Dave Bray and his ‘colorful’ farm analyses

  “The germs that cause mastitis now are the same as the ones causing mastitis in the 1940s!”

  “We’ve got to move out of 1940s level of management.”

  ![Cows in a farm]

  ![Cows on pasture]
Evolution of ‘Diseases’ in Florida 1980-2017

• Mastitis
  – Facilities were the 1st major step forward
  – How to manage those facilities
Evolution of ‘Diseases’ in Florida 1980-2017

• Mastitis
  – Facilities were the 1st major step forward
  – How to manage those facilities
  – Where are we now?

Evolution of ‘Diseases’ in Florida 1980-2017

• Mastitis
  – Facilities were the 1st major step forward
  – How to manage those facilities
  – Where are we now?
Evolution of Facilities in Florida 1980-2017

• Heat stress
• Cow housing
• Calf housing
• Maternity housing

This might be big!

1980s – Bob Collier, Bill Thatcher, et al.

–This might be big!
Evolution of Facilities in Florida 1980-2017

• Heat stress / Cow Housing

Evolution of Facilities in Florida 1980-2017

• Heat stress / Cow Housing / Cow Comfort
Evolution of Facilities in Florida 1980-2017

- Heat stress / Cow Housing / Cow Comfort

Welfare Assessments

<table>
<thead>
<tr>
<th>Animal weight (lbs)</th>
<th>Freetail width (in)</th>
<th>Freetail length (in)</th>
<th>Neck roll length (in)</th>
<th>Curb-to-curb roll and bracket bond (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>800-1,200</td>
<td>42 to 44</td>
<td>7' 0&quot; to 7' 6&quot;</td>
<td>41 to 45</td>
<td>62</td>
</tr>
<tr>
<td>1,200-1,500</td>
<td>45 to 48</td>
<td>7' 0&quot; to 7' 6&quot;</td>
<td>44 to 47</td>
<td>66</td>
</tr>
<tr>
<td>over 1,500</td>
<td>48 to 52</td>
<td>7' 0&quot; to 7' 6&quot;</td>
<td>48 to 50</td>
<td>71</td>
</tr>
</tbody>
</table>

* An additional 12" to 18" in length (compared to side-lunge stile) is required to allow the cow to thrust her head forward during the Tango process.

+ Above top of curb or top of mattress (Univ of Florida, 2008).
Evolution of Facilities in Florida 1980-2017

- Heat stress
- Cow housing
- Calf housing

Evolution of Facilities in Florida 1980-2017

- Calf housing
Evolution of Facilities in Florida 1980-2017

• Calf housing
Evolution of Facilities in Florida 1980-2017

- Calf housing

Pre-wean Calf Mort (%)
Evolution of Facilities in Florida 1980-2017

• Calf housing

Pre-wean Calf Mort (%)
Evolution of Facilities in Florida 1980-2017

• Calf housing

Group Feeding / Housing

• SANITATION
Group Feeding / Housing

- **SANITATION**
  - You’ve got to dot ‘em & cross ‘em in group housing systems

Evolution of Facilities in Florida 1980-2017

- Heat stress
- Cow housing
- Calf housing
- **Maternity housing**
Evolution of Facilities in Florida 1980-2017

- Heat stress
- Cow housing
- Calf housing
- Maternity housing

Moore et al., 2005

28-33% reduction in colostrum quality by delayed harvest of colostrum
Evolution of Facilities in Florida 1980-2017

- Maternity housing

Gainesville, FL, April 20, 2017
Evolution of Facilities in Florida 1980-2017

• Maternity housing

Evolution of Facilities in Florida 1980-2017

• Maternity housing
Evolution of Facilities in Florida 1980-2017

- Maternity housing

Evolution of Feeding in Florida 1980-2017

- ‘One shot’ cottonseed hull based diet
- ‘One shot’ with supplemental hay
Evolution of Feeding in Florida 1980-2017

• ‘One shot’ cottonseed hull based diet
• ‘One shot’ with supplemental hay
• Partial TMR
• TMR

Evolution of Feeding in Florida 1980-2017

• ‘One shot’ cottonseed hull based diet
• ‘One shot’ with supplemental hay
• Partial TMR
• TMR

Forage production
End Result 1980-2017

- Herd milk production >28,000 lb/cow/lact
- SCC <200,000 year round
- Clinical mastitis rate <2 cases/100 cows/mo
- Pregnancy Rates >22%
- Cull Rates <30%
- Calf Mortality Rates <3%

Why Not Reproduction?

- Change is slow
- I am slower!

Petroglyphs of southern Utah, circa 1650
Cryptosporidiosis aka ‘Crypto’

- Diarrheal disease of young calves
- Every calf in Florida gets infected with crypto
- Every calf in Florida becomes diseased
- “What can you do about it?”

‘Crypto’

- Antibiotics – Halofuginone, Amikacin, Paramamycin
- Antiparasiticides – Deccox, Bovatec
- Activated charcoal & wood vinegar – ‘First Choice’
- Herbals – Essential oils of oregano
- Aloe vera juice – “Cures everything!”
- Vaccine – Promises, Promises
- Disinfectants - ammonium hydroxide, hydrogen peroxide, chlorine dioxide, 10% formol saline, and 5% ammonia
‘Crypto’

“What can you do about it?”

• Maximize sanitation
• Supply >>100% of energy and protein requirements for maintenance and growth
• High quality feed ingredients! Milk works pretty good!
• Keep ’em hydrated
• Kaolin-pectin, bismusol, probiotics

Improvise, Adapt, Overcome!
Thank you !!