Maximizing Whole Farm Feed Efficiency

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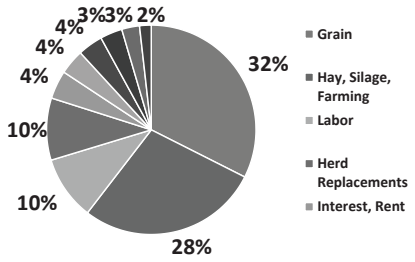
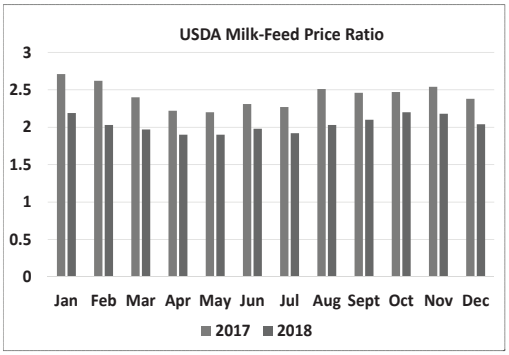
Feed Cost vs Feed Efficiency

	Daily Milk Production/c, lbs				
	80	85	90	95	100
Daily Feed cost/c @$8.50/cwt	$6.80	$7.23	$7.65	$8.08	$8.50
Increased Daily Feed Cost vs base, $		$0.43	$0.85	$1.28	$1.70
Estimated Daily Feed Cost vs Base, $		$0.26	$0.52	$0.78	$1.04
Potential Daily Difference, $		$0.17	$0.33	$0.49	$0.66
Potential Daily Feed Cost/c		$7.06	$7.32	$7.58	$7.84
Estimated Feed Cost/cwt		$8.31	$8.13	$7.98	$7.84

2017 Percentage of Total Cost of Dairy Production



Genske, Molder Company

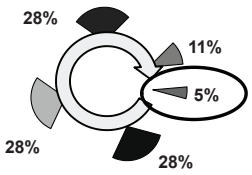


Thoughts to Consider

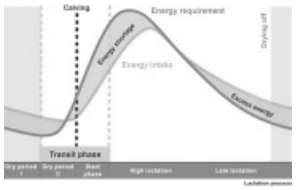
- Efficient use of feedstuffs
  - Measured?
    - Dairy or whole farm
    - Per unit of milk, cow, total cost
    - Financial impact
  - Accounting for feedstuff loss
    - Physical
    - Financial
- Economic opportunity?

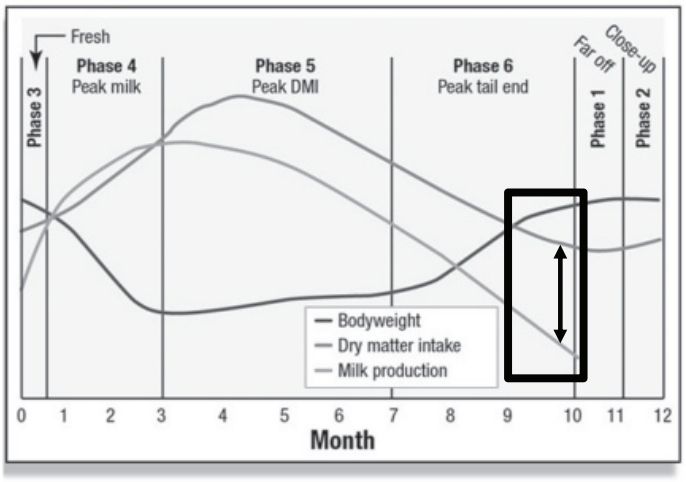
First Things First

- Production Cycle
  - Transition
    - 3 wks pre-calving
    - 3 wks post-calving



- Reproduction
  - Days in Milk
  - Pregnancy Rates

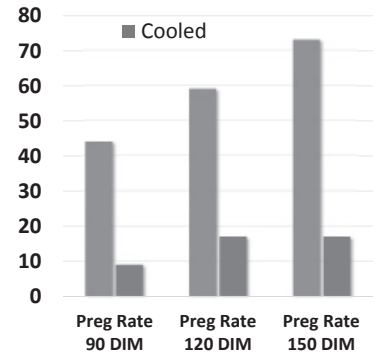




Source: Dr. Mike Hutjens, University of Illinois, Extension Dairy Specialist

Pregnancy Rates of Cooled and Non-Cooled Cows

Cooled cows = <102.2ºF (39ºC) Body Temperature
Non-Cooled Cows > 103.1ºF (39.5ºC) Body Temperature
Flamenbaum, 2012



Focus

- **Pre-Fresh**
  - Health Start
  - Cow Comfort
  - Absence of Metabolic Disease
- **Early Lactation – 150 DIM**
  - Peak Milk
    - 1 pound Peak = 250 – 300 pounds on lactation
  - Intake
    - 1 pound increased DMI = 2.5 to 3 pounds of milk
  - Cow Comfort
  - Cow Health
  - Reproduction

Impact on Dry Cow Cooling

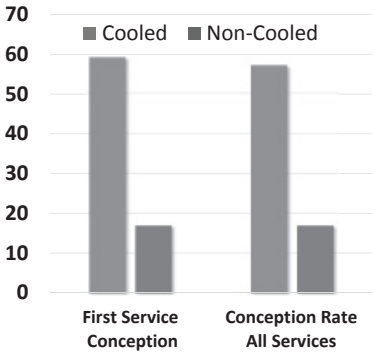
Summary of current research on the influence of dry cow cooling on milk yield (lb/d).

Study	Method	Milk (lb/d) of cows not cooled	Milk (lb/d) of cows cooled
Avendaño-Reyes et al., 2006 (Mexico; 56 DIM)	Fans and water spray (mist ring)	55.9[a]	71.5
Urdaz et al., 2006 (CA; 60 DIM)	Add fans/shades to sprinklers over feed bunk	84.9[c]	88
do Amaral et al., 2008 (FL; 42 DIM)	Fans and sprinklers	55.9[c]	73.0
do Amaral et al., 2009 (FL; 140 DIM)	Fans and sprinklers	67.8[b]	78.3
Adin et al., 2009 (Israel; 90 DIM)	Fans and foggers along feed bunk	86.2[c]	90.9
Tao et al., 2010 (FL; 147 DIM)	Fans and sprinklers	69.5[b]	80.3

[a]$P \leq 0.15$, [b]$P \leq 0.10$, [c]$P \leq 0.05$

Conception Rates of Cooled and Non-Cooled Cows

Cooled cows = <102.2ºF (39ºC) Body Temperature
Non-Cooled Cows > 103.1ºF (39.5ºC) Body Temperature
Flamenbaum, 2012



Effect of Pre-Fresh Cow Cooling

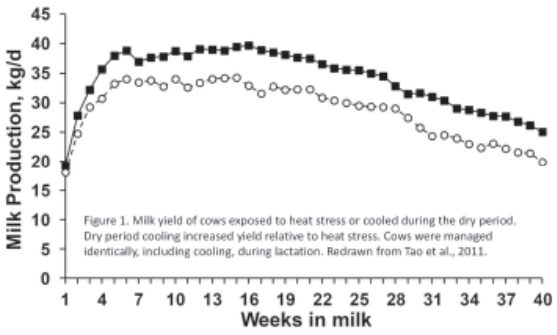


Figure 1. Milk yield of cows exposed to heat stress or cooled during the dry period. Dry period cooling increased yield relative to heat stress. Cows were managed identically, including cooling, during lactation. Redrawn from Tao et al., 2011.

Dry Cow Cooling

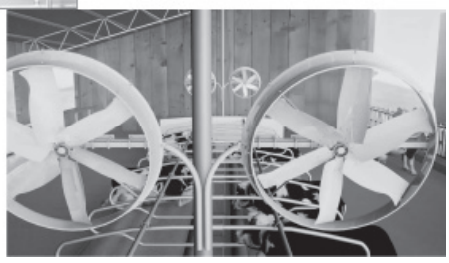
- **Missed Opportunity**
- **Relatively Inexpensive to Install**
- **Heat Stress Months 4-5**
- **Track Success of Cows Dry June – August**
- **Track Success of Cows Calving June - September**

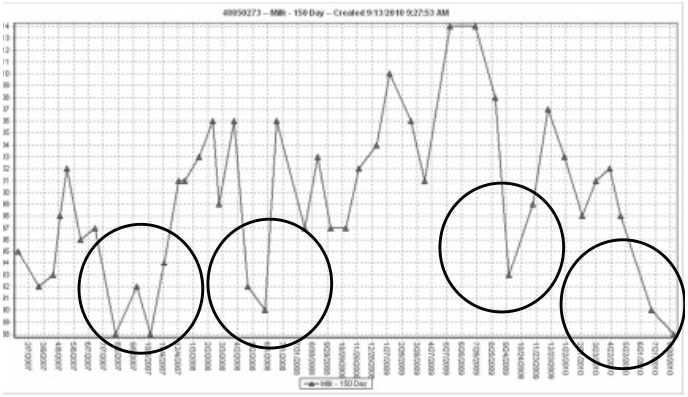
Increased CBT

- Milk production drops when rectal temps exceed 39°C (102.2F) for more than 16 h (Igono and Johnson, 1990)
- Milk yield declines 1.8 kg for each .55°C increase in CBT above 38.9°C (Johnson, 1963)
  - 39°C→39.5°C = drop of 1.8 kg or 4 lbs. of milk

Additional Transition Considerations

- **Feed Additives**
  - Monensin
  - B-Vitamins
    - Choline
    - Niacin

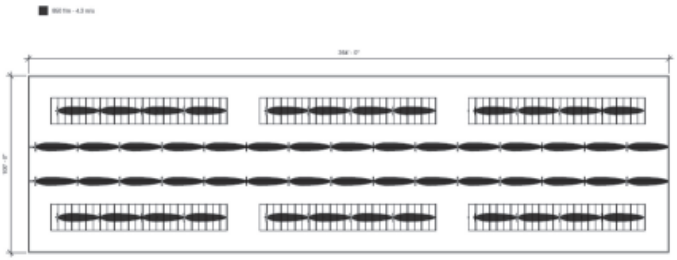




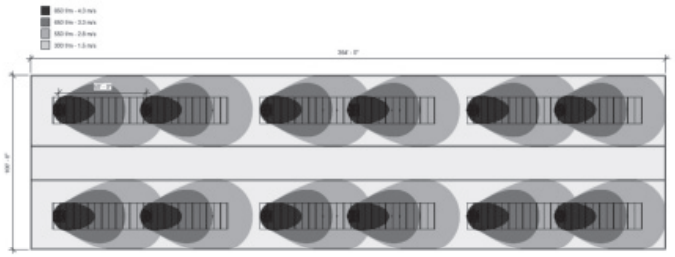
15 to 25 pound drop each summer !!!!

$2.40 to $4.00/c/d

Air flow pattern from 36” fans mounted every 24 ft



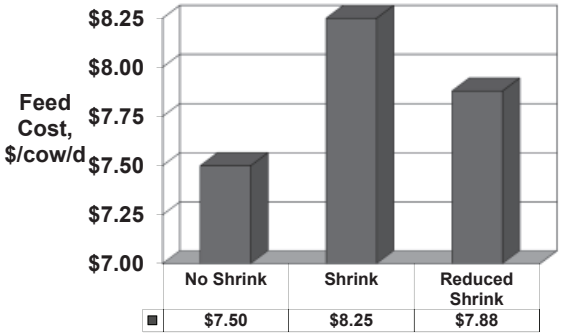
Air flow pattern from 72" fans (ECVC) mounted every 50 ft



How to Make $50,000

- **Increase milk price**
  - **500 cows @ 85 lb/cow = $0.32/cwt**
- **Increase milk production**
  - **500 cows @ $16/cwt = 3.2 lbs/cow daily**
- **Reduce feed shrink**
  - **4% @ $7.50 daily feed cost**

Real Feed Cost



Can You Measure True Feed Cost?

- **Shrink -**
  - Amount Delivered
  - Amount Fed
  - Difference is Shrink
- **Factors**
  - Moisture
  - Spoilage
  - Losses
    - Wind
    - Animals

What Can't Be Measured Can't Be Managed!!!!!!

Herd Size	Annual loss @ $7.50 Feed Cost /cow daily		
	8%	10%	12%
500	$ 109,500	$ 136,875	$ 164,250
1,000	$ 219,000	$ 273,750	$ 328,500
1,500	$ 328,500	$ 410,625	$ 492,750
2,000	$ 438,000	$ 547,500	$ 657,000

Ingredient	Herds	Range, %	Weighted mean, %
Corn Silage (Pile or Pit)	15	4.8 – 16.0	9.1
Corn Silage (Bag)	8	6.5 – 14.0	9.9
Haylage (Pile or Pit	12	5.6 – 16.0	10.2
Haylage (Bag)	11	8.5 – 17.0	10.7
Bulky Ingredients	14	3.5 – 14.0	11.3
Wet Byproducts	13	12.0 – 40.0	23.0
Bagged Ingredients	16	2.0 – 19.0	8.1

Greene, 2014

Storage Type	Herds	Range, %	Weighted mean, %
Feed Center (3-Sided)	16	2.5 – 11.0	6.7
Feed Center (Enclosed)	5	2.0 – 7.0	4.0
Upright/Over-head Storage	7	2.0 – 7.0	4.0

Greene, 2014

Where is the Shrink on Your Farms?

Example of Shrink in a Commodity Barn

- **Dry Distillers**
  - 8.4%
- **Canola Meal**
  - 3.5%
- **Whole Cotton Seed**
  - 5.2%
- **Mineral**
  - 1.6%
- **Flaked Corn**
  - 2.7%

$0.13/c/day

4,500 cows

$213,525/yr

Attitudes on Shrink Control

- **Lack of Data**
  - **"Can't Manage What You Can't Measure"**
- **Cost of Doing Business**
- **Out of Sight Out of Mind**
- **Not Worth My Time**
- **Potential Profit Opportunity**

Hay Bales
Roll Tarps
Brooms

Reduced
Shrink
Initial Cost
Inventory

500 Cow Dairy

Annual Savings
32.5 tons SBM =
$12,350

20 minutes/load
4 hr/d or
1,460hr/year
$73,000/yr

Feed Centers

- **Reduced Shrink**
  - **< 2%**
- **Increased Material Handling Efficiency**
- **Reduction in Feeding Time**
- **Reduction in Energy Consumption**
- **Payback Opportunity**

Cost of Delivery Error

	Deviation Wt, lb	Cost/lb,$	Cost/Mix $
Corn Silage	120	0.025	3.00
Alfalfa Hay	90	0.125	11.25
Corn	20	0.071	1.42
SBM	20	0.20	4.00
Premix	30	0.45	13.50
Molasses	20	0.060	1.20

$0.229 cow/day

$83,634 1000 cows/year

$34.37

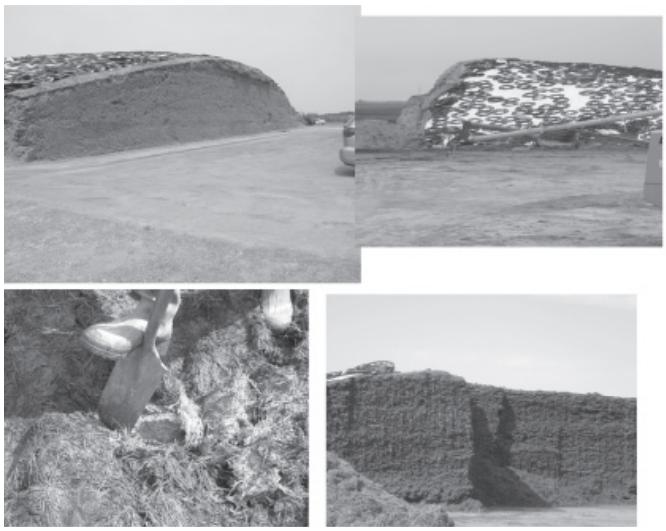
Improving Feeder Accuracy

- Tracking program
- DM of wet feeds
- Premix – small inclusion - 5lb/head
- Loader bucket size
- Regular review of data

Feed Delivery Errors

	Target Wt, lb	Loaded Wt, lb	Deviation Wt, lb	% Error
Corn Silage	9,000	9,120	120	1.3
Alfalfa Hay	3,200	3,290	90	**2.8**
Corn	2,000	2,020	20	1.0
SBM	800	820	20	**2.5**
Premix	400	430	30	**7.5**
Molasses	100	120	20	**20.0**

150 Cow Mix



What is Your Silage Storage Loss?

- Fermentation – **6% of DM**
- Seepage – **1% of DM**
- Surface – **up to 50% of DM**
- Feedout – **5 - 15% of DM**
- Type of Storage
  - Bags – 10 - 12%
  - Bunkers – 15 - 20%
  - Piles – 15 - 25%
  - Towers – 10 - 12%

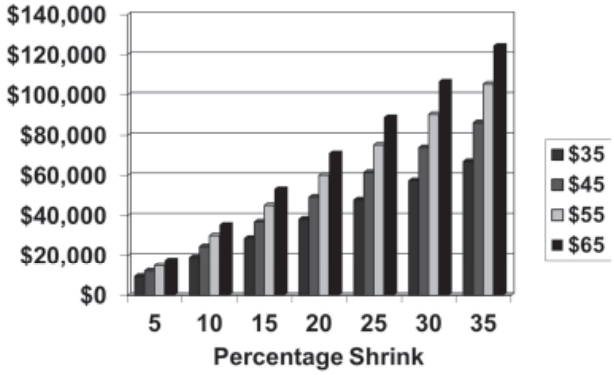
Impact of Feeding Spoiled Silage to Steers

Item	0% Spoiled	25% Spoiled	50% Spoiled	75% Spoiled
Intake, lb	**17.5**	**16.2**	**15.3**	**14.7**
% Reduction		**7.4**	**12.6**	**16.0**
NDF Digestibility, %	**63.0**	**59.5**	**56.0**	**51.0**

7% Decrease in DMI = **3.5 lb of DMI = 10.5 lb of milk**

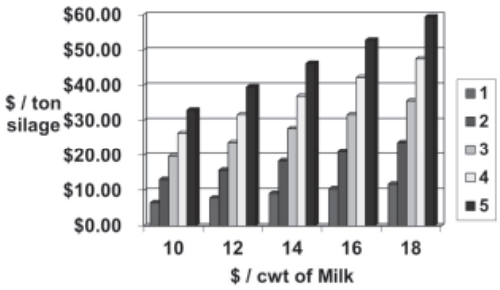
Bolsen, 2004

Annual Cost of Silage Loss
1,000 Cows fed 30lb/c/d of silage



Additional Benefits

- Reduced loss = Increased Forage Quality
  - *30 lb feeding rate* *66 cows/ton*



Tons and Acres Required for Annual Silage Shrink

Amount of Shrink, %

	5	10	15	20	25	30	35
Extra Tons	**274**	**548**	**821**	**1,095**	**1,369**	**1,643**	**1,916**
Extra Acres	**9.1**	**18.3**	**27.4**	**36.5**	**45.6**	**54.8**	**63.9**

1,000 cows fed 30 lbs silage per day
Acres estimated based on a yield of 30 ton/acre

Silage Management

- **Reduced Losses of DM and Nutrients!!**
  - Can you measure this?
- **Reduce Secondary Fermentation**
  - Silo Face Size
  - Face Management
  - Packing and Covering
- **Improve Milk Production**
- **Reduce Feed Cost per cwt of Milk**

Keys to Silage Success

- Silo Sizing and Selection
- Hybrid Selection
- Harvest Moisture
- Harvest Quickly
- Inoculants
- Packing Density
- Covering
- Feeding Management

Quotes from John Wooden

- **"Do not let what you cannot do interfere with what you can do."**
- **"It's the little details that are vital. Little things make big things happen."**
- **"Failing to prepare is preparing to fail."**
- **"Failure is not fatal, but failure to change might be."**
- **"Make each day your masterpiece."**

Whole Farm Efficiency

- Take the Right Measurements
- Utilize the Data
- Focus on the Right Things
  - Cows
  - Forages
  - Cow Comfort
- Be Consistent
- Involve the Whole Team