

# Understanding “SHRINK” in Beef Cattle

John Arthington

Professor and Center Director

Range Cattle Research and Education Center, Ona

[jarth@ufl.edu](mailto:jarth@ufl.edu)



**UF/IFAS RANGE CATTLE  
RESEARCH &  
EDUCATION CENTER**

# Shrink in market calves

- Calf shrink is generally poorly understood by cow-calf producers.
- Cattle buyers understand shrink very well and are able to use the concept to improve value of their purchased calves.
- Shrink is inevitable. Minimizing shrink will add considerable value to a marketed calf.
- Cows > Calves > Feeders > Finished

# Factors affecting shrink

- Feed and water restriction
- Trucking
- Temperature
- Stress
  - Commingling
  - Gathering
- Gathering time
- Preconditioning



# F.M. Pate, University of Florida Range Cattle REC

“Considering the time involved, there are more dollars made or lost from cattle shrink than any other phase of the beef business”.



# Loss in calf value due to shrink



Shrink, %	Value, \$	Value Lost, \$
0	800	0
2	784	16
4	768	32
6	752	48
8	736	64
10	720	80

# Cattle Shrink – two types

## ■ Fill Shrink

– Cattle held from feed and water overnight.

■ Rumen fill

■ Manure

■ Urine

## ■ Tissue Shrink

– Decreased carcass weight

■ Extra- and intra-cellular fluid loss

# Fill Shrink

- Fill shrink is usually recovered in a short period of time once feed and water access is restored.

Hours off pasture	Calf weight, lb	% Shrink
0	688	
5	661	4.0
10	650	5.6
17	640	7.1
24	633	8.1
Hours back on pasture		
6	687	
25	694	

Cravey et al., 1991

# Rule of Thumb

- Cattle typically shrink 1% per hour for the first 3 to 4 hours without food and water.
- After 4 hours this rate declines to about 0.1% per hour for up to 10 hours.





# Tissue Shrink

- Tissue shrink is usually associated with long periods without feed and water – such as a long 24-hour haul. Tissue shrink usually takes up to 10 days to recover.

Source of shrink	% of weight loss
Digestive Tract	
Fill	3.2
Tissue	0.4
Carcass	1.9
Hide	0.6
Other	0.4
Total	6.5

*Self and Gay, 1972*

*Yearling feeder  
steers; hauled 24-h*

# Shrink affects the seller and buyer

- Negotiating the impact of shrink helps the buyer and seller.
  - Pencil Shrink (3 to 4%)
    - Gross weight
    - Pay weight
  - Time calves are run through sale ring?



# Diet prior to shipping will impact calf shrink

- Calves consuming a dry forage diet will shrink less compared to cattle on lush pasture – BUT, highly variable . . .

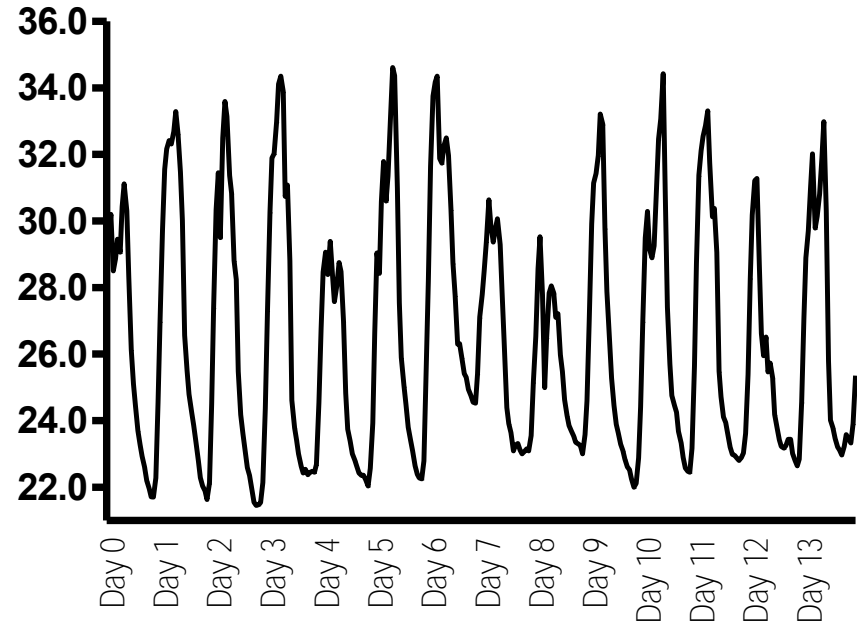
Pre-shipment Forage	% Shrink after 4 hours on truck
Wheat pasture	5.1
Drylot with hay	3.9

# Trucking increases shrink

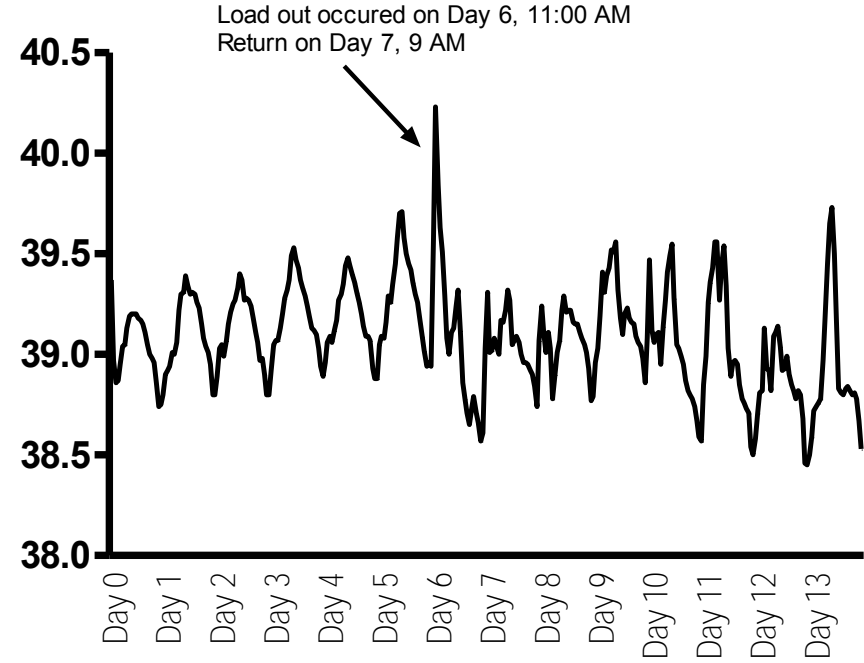
- Weaned calves standing in a drylot experience less shrink than calves in a moving truck.

Time following weaning	Standing in a drylot	Standing in a moving truck
	----- Shrink, % -----	
8 hours	3.3	5.5
16 hours	6.2	7.9
24 hours	6.6	8.9

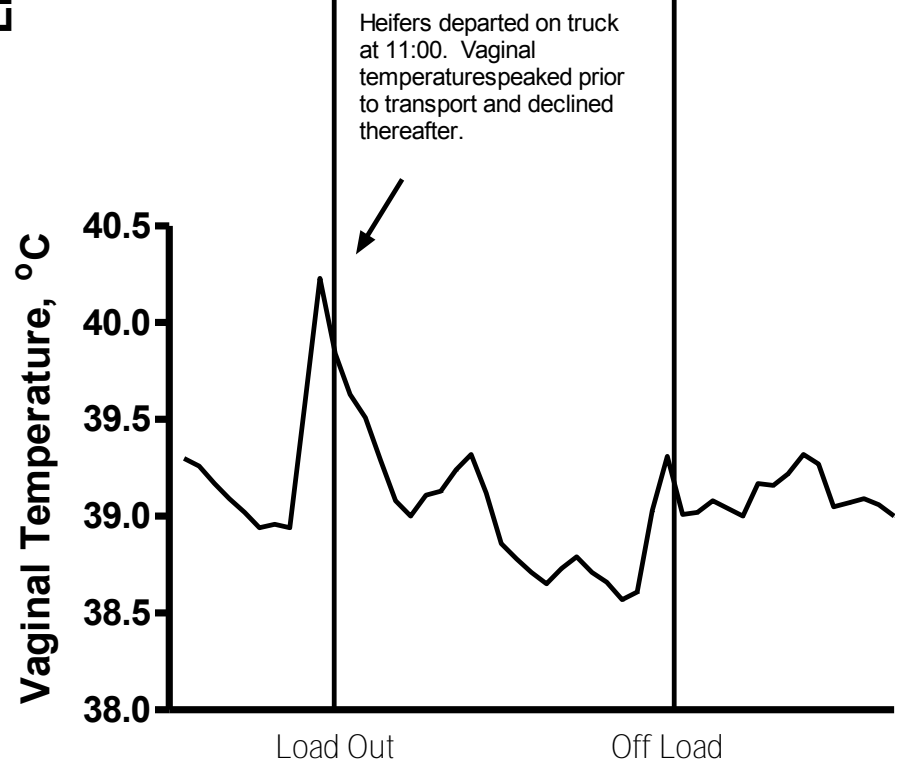
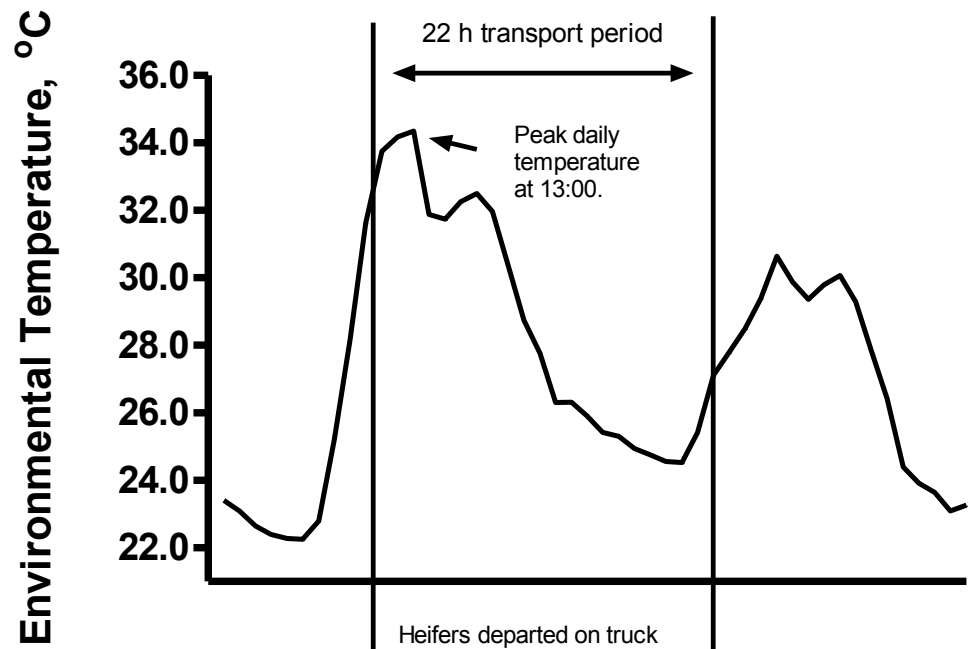
Environmental Temperature, °C



Vaginal Temperature, °C



34° C = 93° F



# When do you gather your calves for transport to market ?

- Typically calves are gathered in the morning.
  - Cooler early morning temperatures
  - Accommodates trucking
- This management procedure may be more costly to producers than previously thought.
  - Majority of a day's total grazing occurs from sun rise to about 9 or 10 AM.

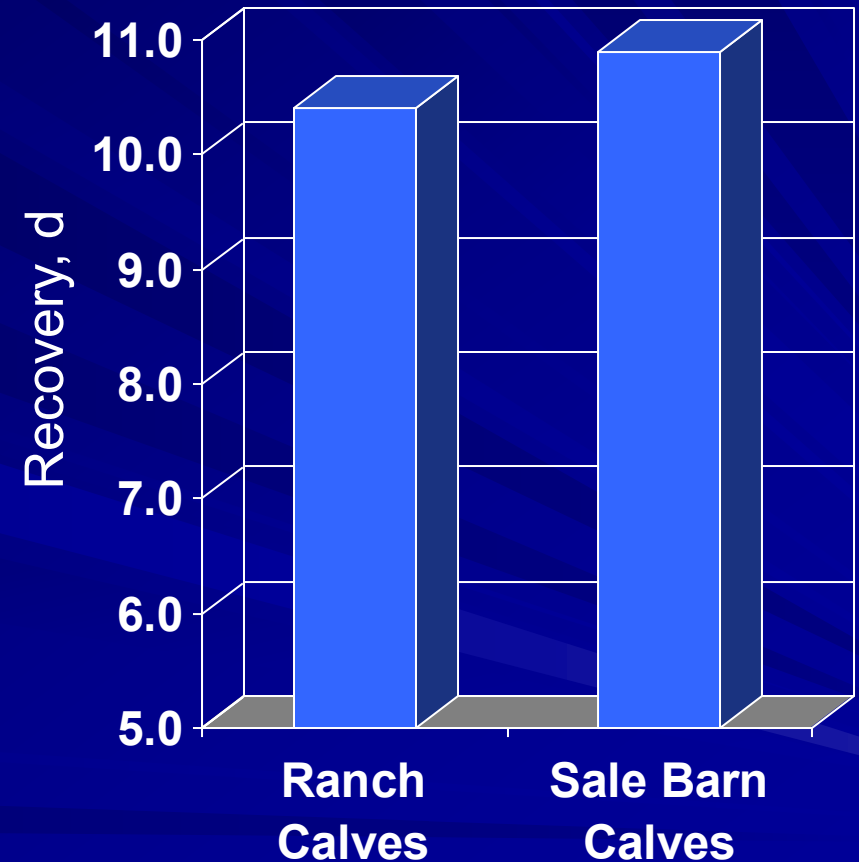
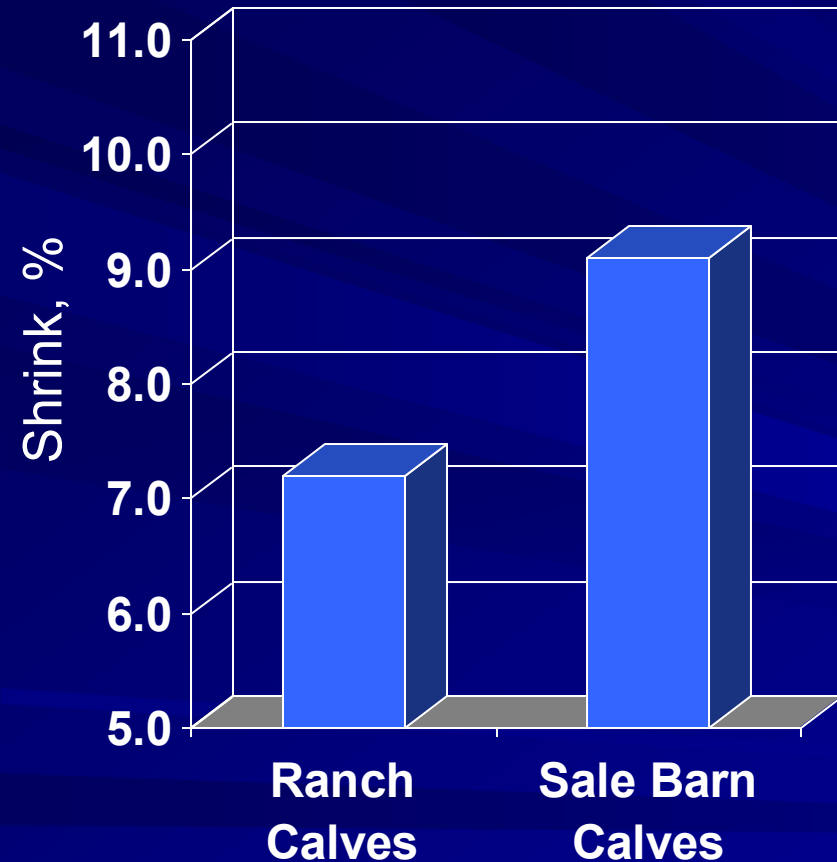
# Gathering calves in the early morning increases shrink

Item	Gathering Time			
	6 a.m.	7 a.m.	8 a.m.	9 a.m.
Off pasture weight, lb	681	684	687	695
Shrink to 3 p.m., %	6.2	5.9	5.0	3.3
Sale weight, lb	639	644	653	672
Added value, \$/head	---	4.15	11.62	27.39
Total value, \$/head	799	803	811	826

Source: Coffey et al., 1997; Calf value (\$1.25/lb); Value of added gain (\$0.83)

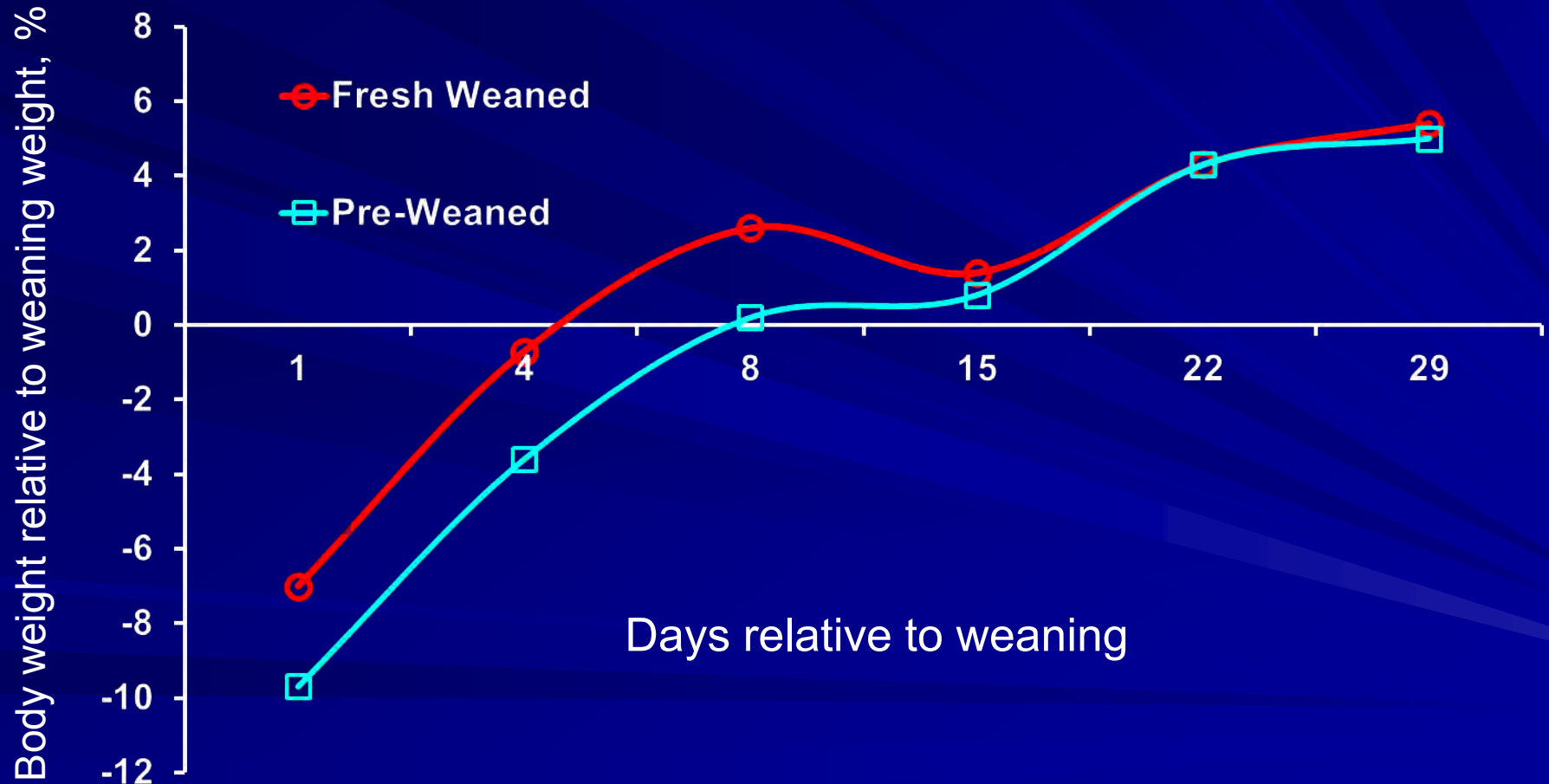


# Shrink and recovery time of ranch- versus sale barn-derived feeder calves



3,455 ranch derived calves shipped an average of 1531 (Self and Gay, 1972)

# Effect of weaning management on calf shrink following transport and feedlot entry



# Additional Findings

Gonzalez et al., 2012

Journal of Animal Science (90:3630 and 3640)

- In addition to economics, shrink has important animal well-being considerations.
- As shrink exceeds 8%, transported cattle are more likely to become lame.
- Cattle shrink less when hauled by drivers with more than 6 years of experience.

# Summary and Conclusions

- Shrink is a major factor influencing the value of beef calves.
- Shrink is unavoidable, but can be minimized.
  - Share shrink with the buyer
  - Gather cattle late in the morning
  - Transition cattle to dryer rations if possible
  - Minimize standing time in pens and sale barn
  - Minimize trucking time

# Thank you for your attention



**75<sup>TH</sup>**  
*anniversary*  
1941-2016

**UF/IFAS RANGE CATTLE  
RESEARCH &  
EDUCATION CENTER**