Cow Milk Production vs Calf Size

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Milk Production vs Calf Size

- Systems approach rather than a calf output approach
  - Calf Output
    - Weaning
    - Postweaning
  - Cow Pregnancy Rate
    - Longevity of the cowherd
  - Production Costs
  - Carrying capacity
  - Flexibility in the System
    - Production Risks
    - Drought/high rainfall, etc

Beef Cattle Industry Ideology

- Measuring outputs is more meaningful than inputs
  - Weaning weight over production costs

- Modify environments in order to “get heavier calves, greater percent calf crop and more total pounds”
  - Little regard to production costs
  - Rather than increasing net return

Reproduction Drives Production Efficiency

- Reproduction is the main factor limiting production efficiency in the beef cow herd (Dickerson, 1970)
  - Greatest production loss in the cow/calf segment (Bellows and Short, 1994)

- Reproduction is 5x more economically important than traits like:
  - Milk production
  - Calf growth (Trenkle and Willham, 1977)

Profitability in Cow/Calf Production

- Two largest factors for profitability from financial and production data from Illinois and Iowa
  - Feed costs – > 50% of variation in profit
  - Depreciation and operation costs – 17% of variation

- Calf BW
  - 5% influence in profitability

Miller et al., 2001

Nebraska & South Dakota Beef Cow-Calf Per Cow; 2015

	Top 35%	Herd Ave	Bottom 20%	Dif	% Dif
Cost of production/cwt	**132.96**	137.71	**155.53**	-$22.57	16%
Number of cows	**122.2**	158.6	**137.8**	-15.6	-11%
Cows per FTE	**656.3**	617.7	**325**	331.3	102%
Culling percentage	**15.8**	17.1	**28.6**		-12.8%
Calving percentage	**95.2**	94.4	**95.6**		-.4%
Weaning percentage	**91**	90.7	**94.1**		-3.1%
Calves sold per cow	**.89**	.90	**.93**	-.04	4%
Calf death loss percent	**2.9**	3.2	**4.5**		-1.6%
Avg. sale wt. of calves	**535**	560	**598**	-63 lbs	-11%
Ave weaning weight	**485**	520	**535**	-50 lbs	-9%
Lbs. weaned/exposed female	**441**	472	**503**	62 lbs	-12%

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Benchmark Report, 40 farms FINBIN© University of Minnesota

Matching Genetic Potential with Forage Resources

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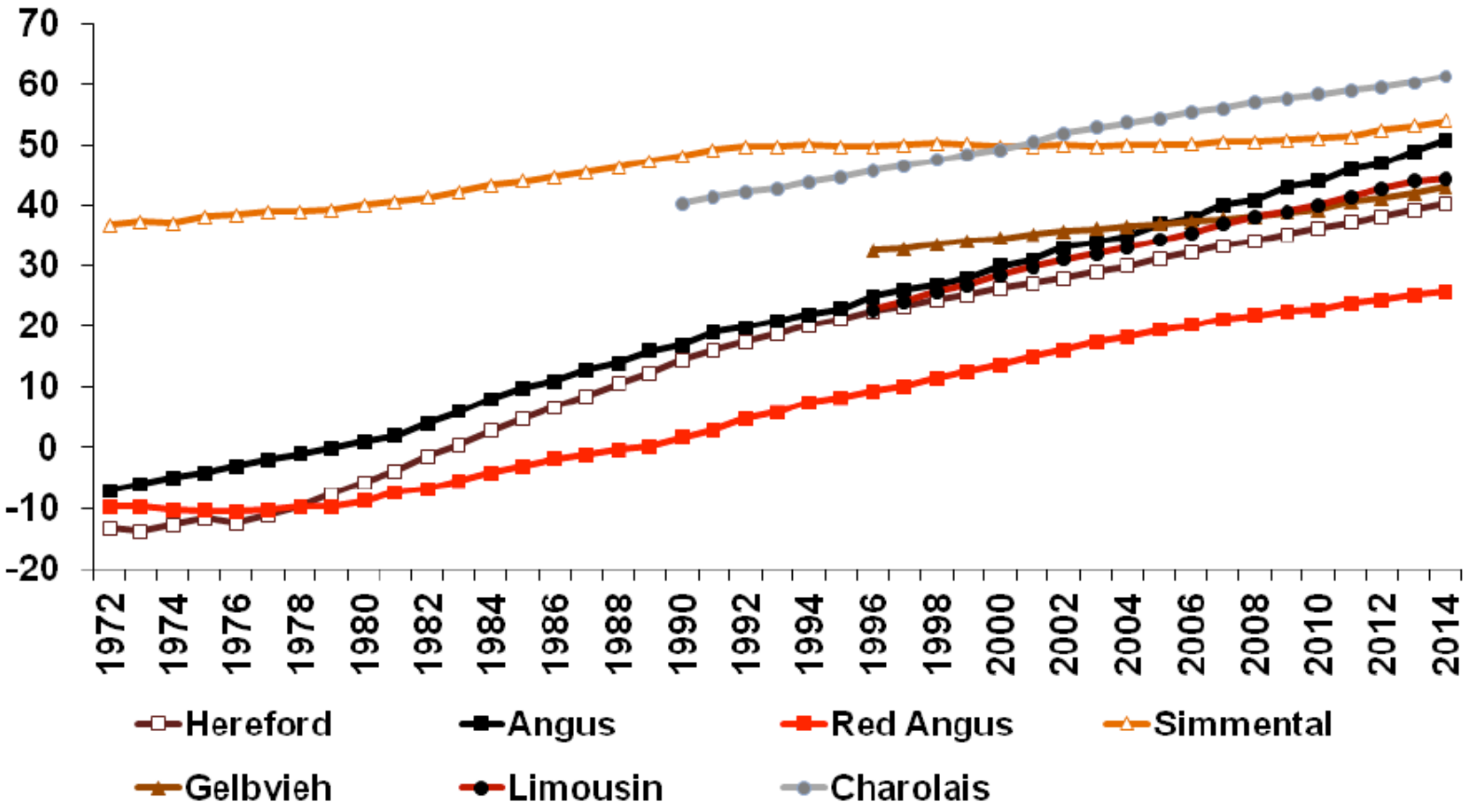
Genetic Selection for Milk



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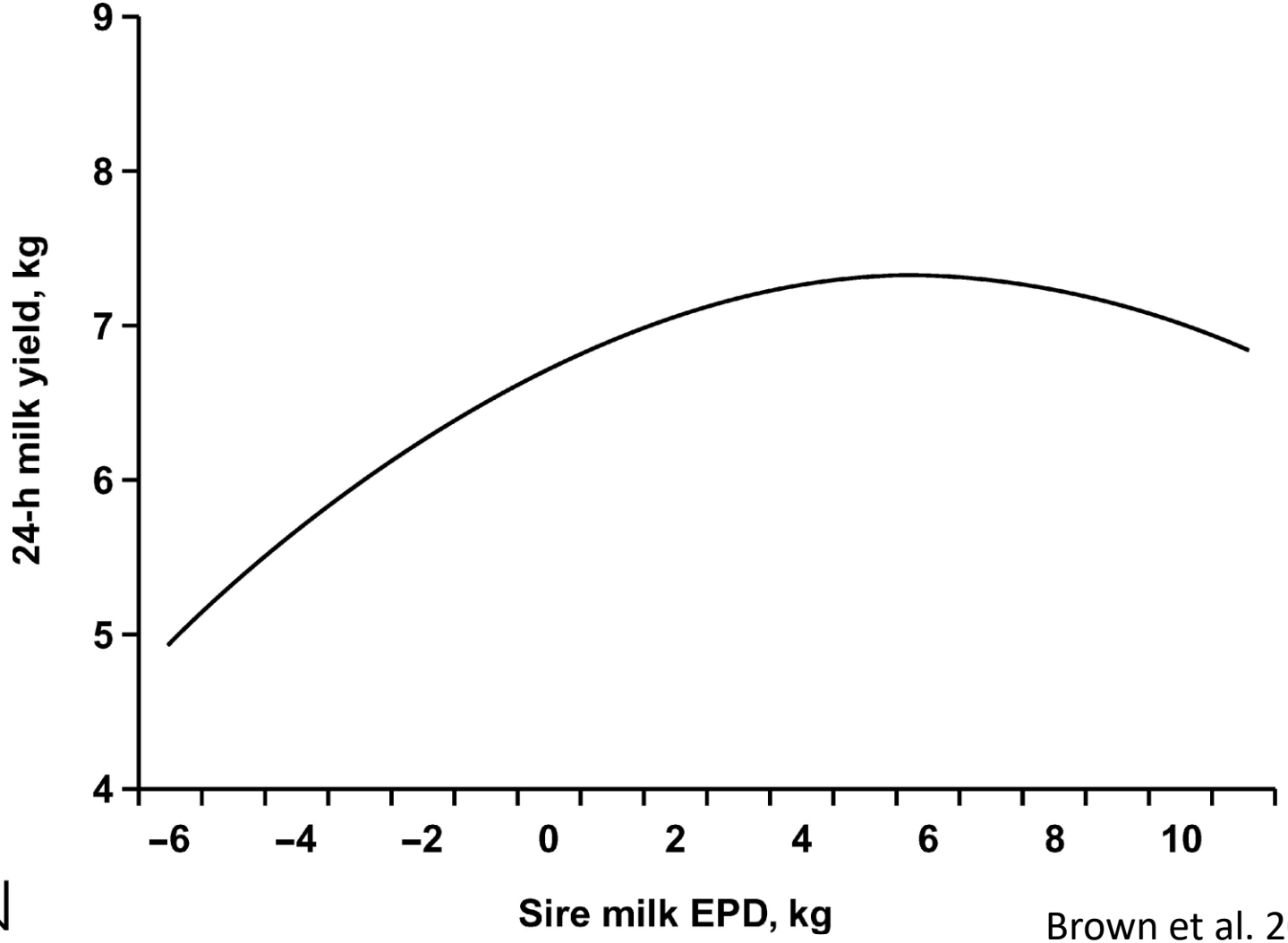
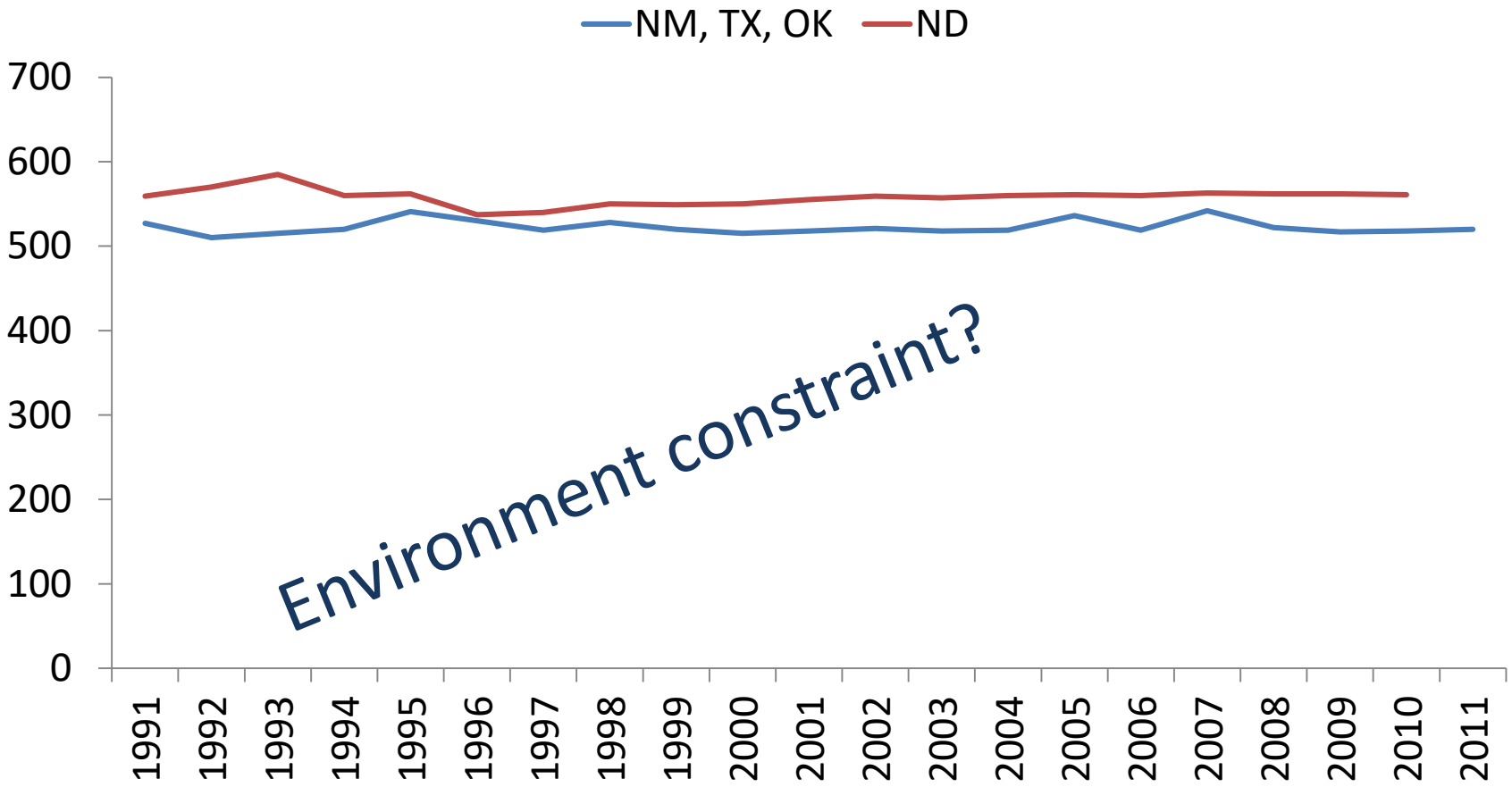
Kuehn and Thallman, 2016

Relationship of sire milk EPD and 24-h milk yield



Brown et al. 2005

Average weaning weight in commercial cow/calf operations



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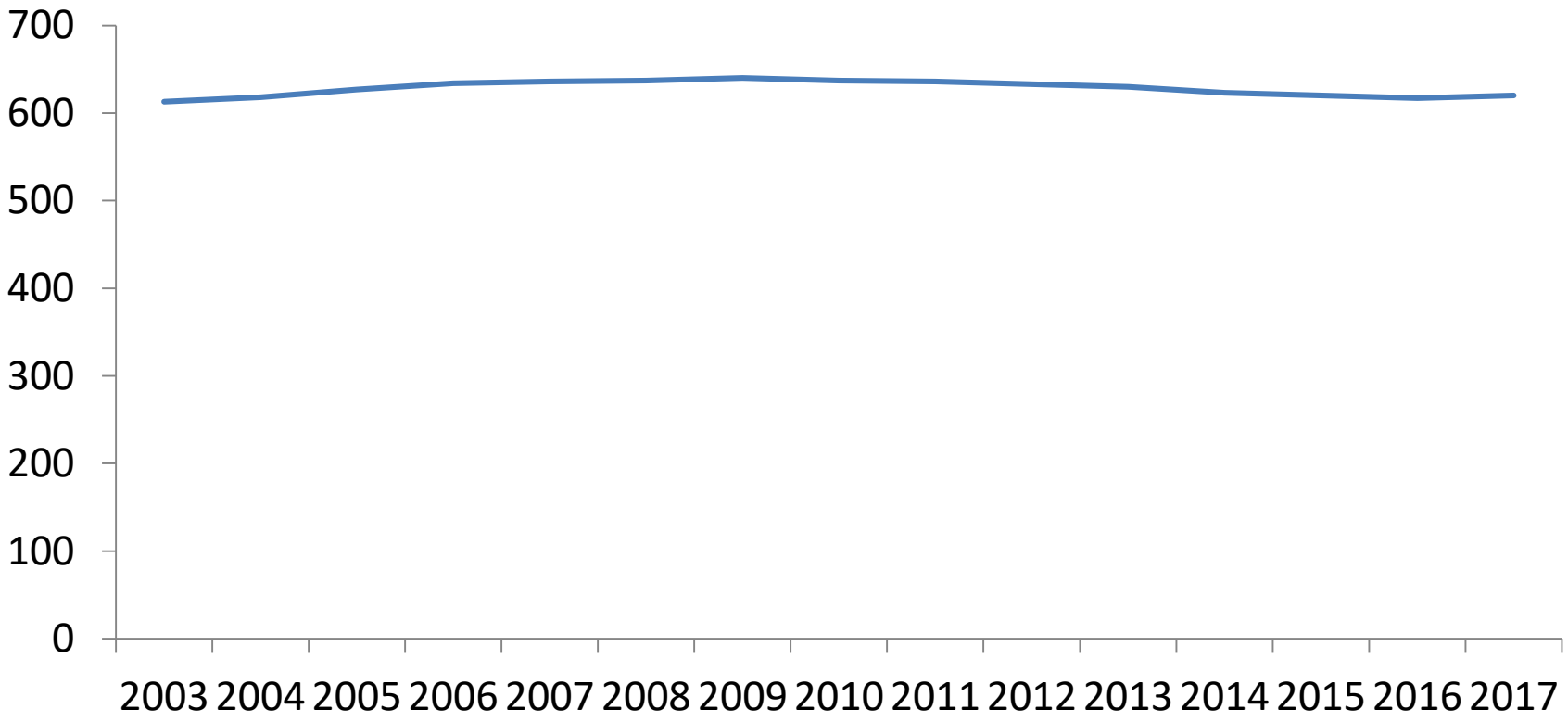
Bevers, 2012

CHAPS: Average 205-d weaning weight in commercial cow/calf operations



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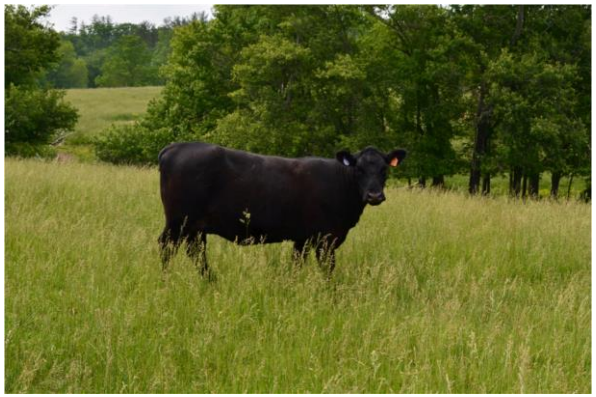
Ramsay et al., 2019

Milk and Calf Gain

- Is there a limit of milk production that YOUR forage can support?
- Is there a limit calf milk intake/milk production that will support additional gain?



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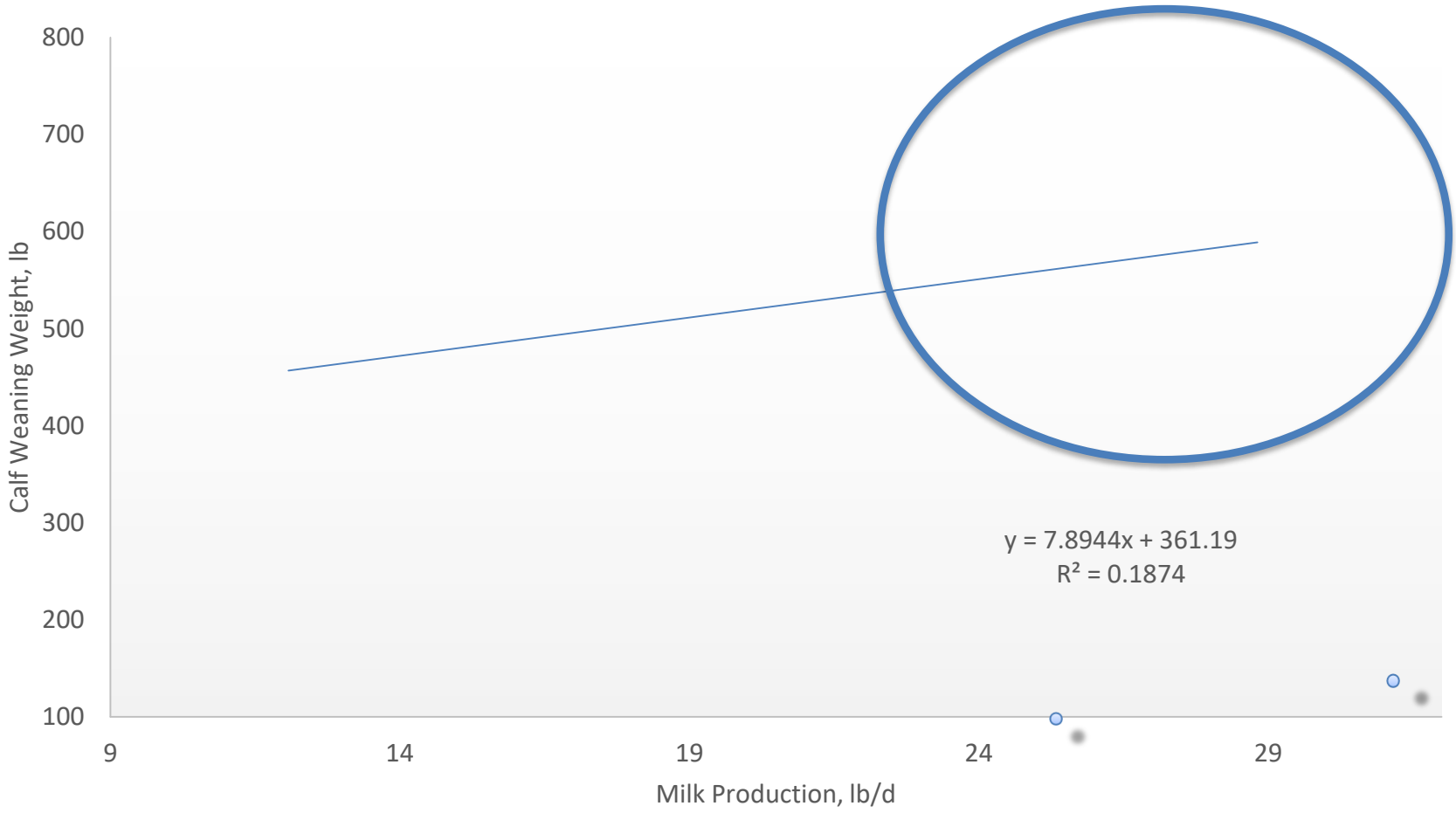
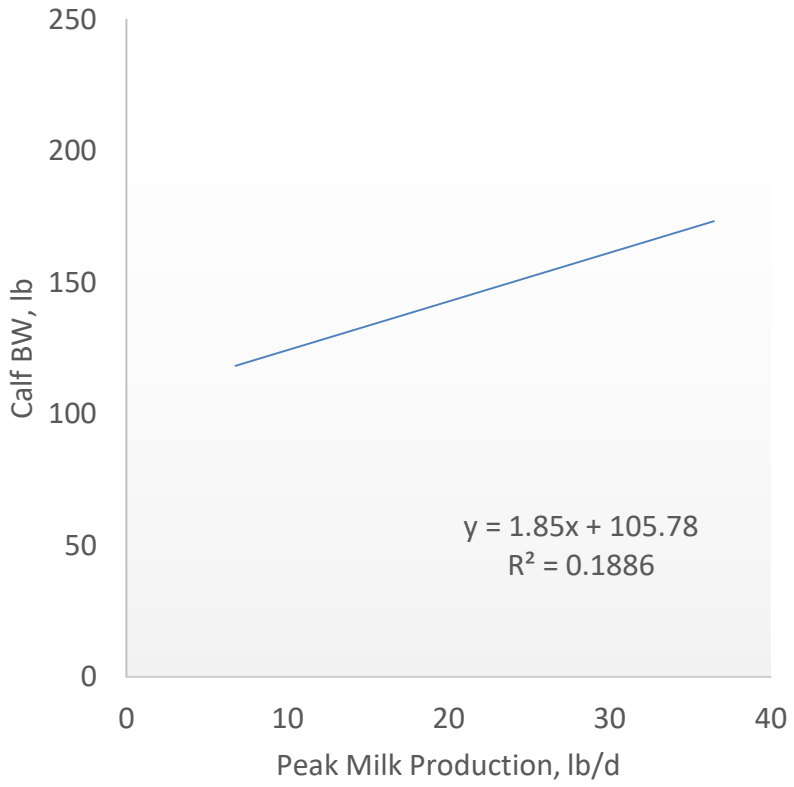
Meta-analysis of 20 published papers on Milk and Calf Weaning Weight



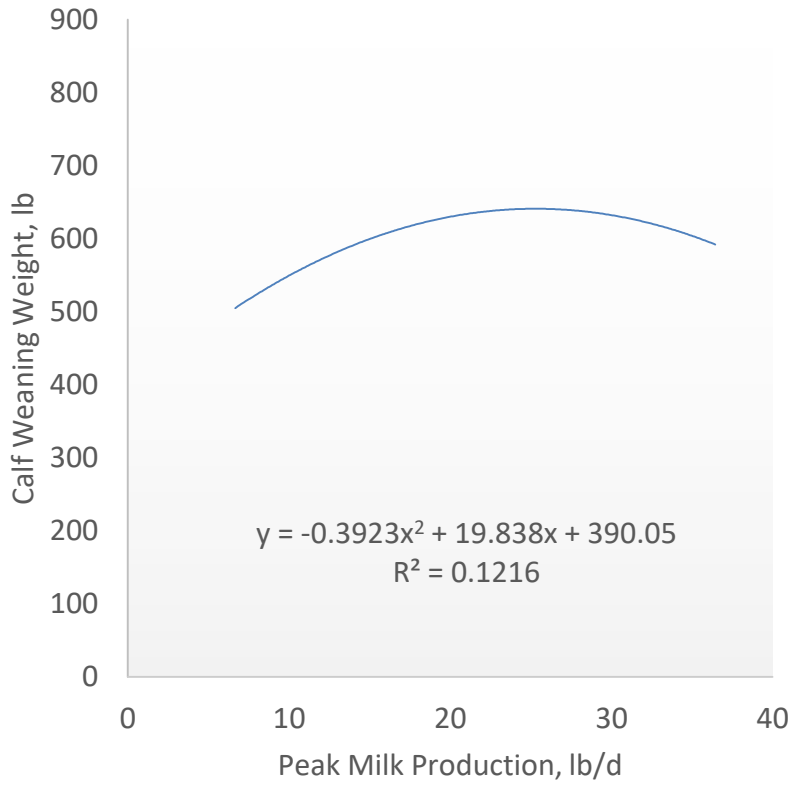
Mulliniks et al. 2020

When does milk influence calf growth?

60 days of age



205 days of age



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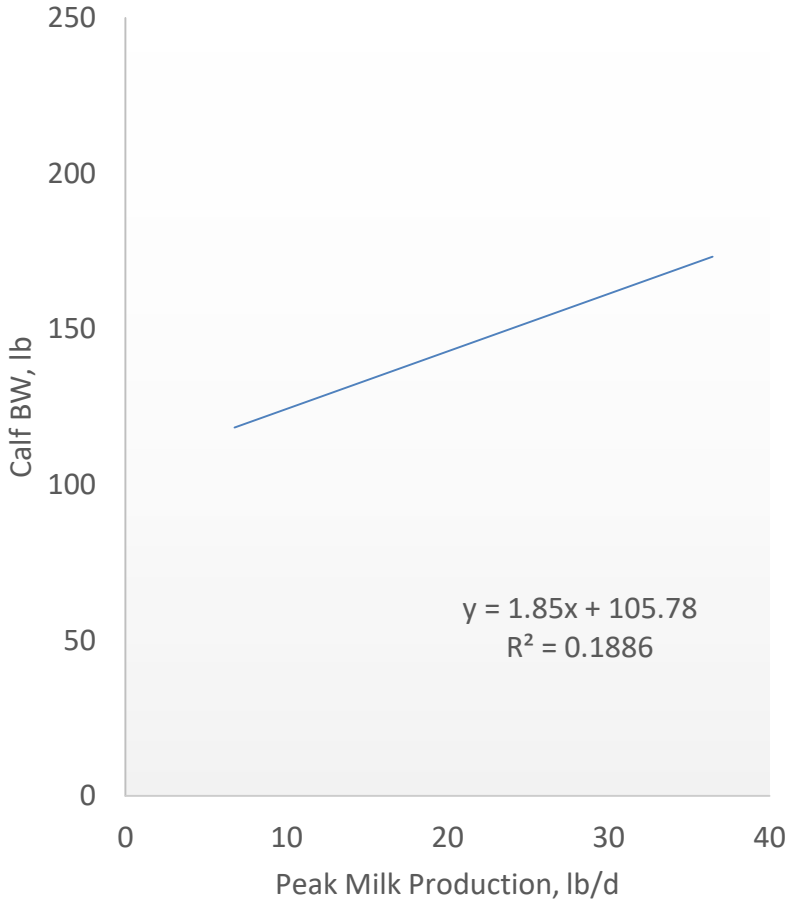
Edwards et al. 2017

Milk Production and Early Calf Growth

- Energy intake ~ 86% from milk at 45 d of age
- Forage intake greater in progeny of low milking dams



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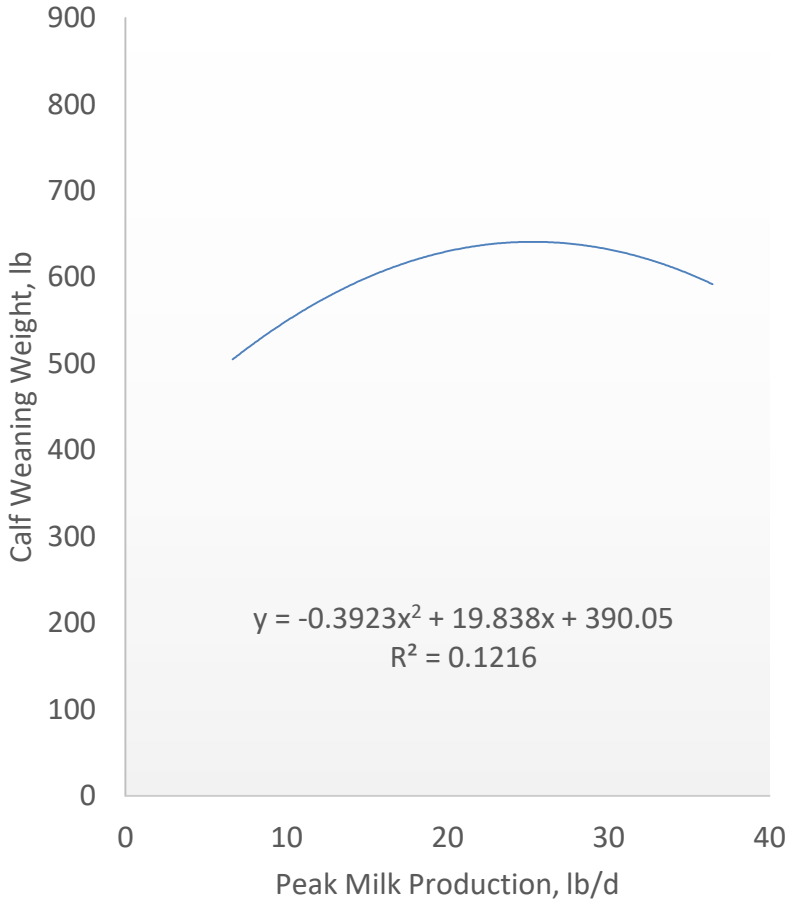
Milk Production and Post-Peak Lactation Growth

- Energy intake from milk ~ 19% by weaning
- Calf growth after peak lactation
  - Similar across milk groups
- Forage intake greater in progeny of low milking dams
  - Offset nutrient intake with forage intake
  - Dependent on forage quality



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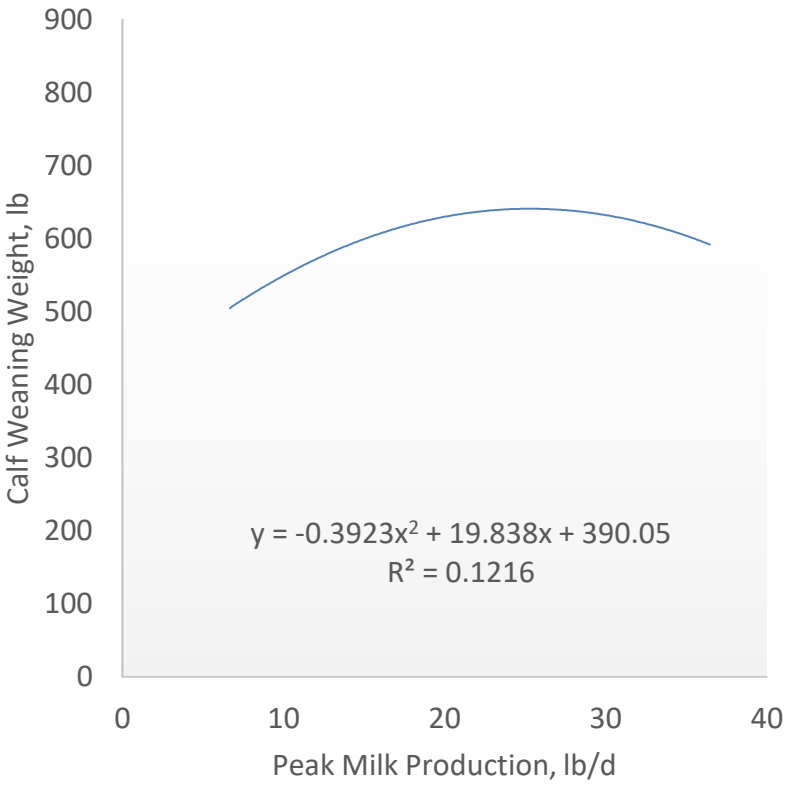
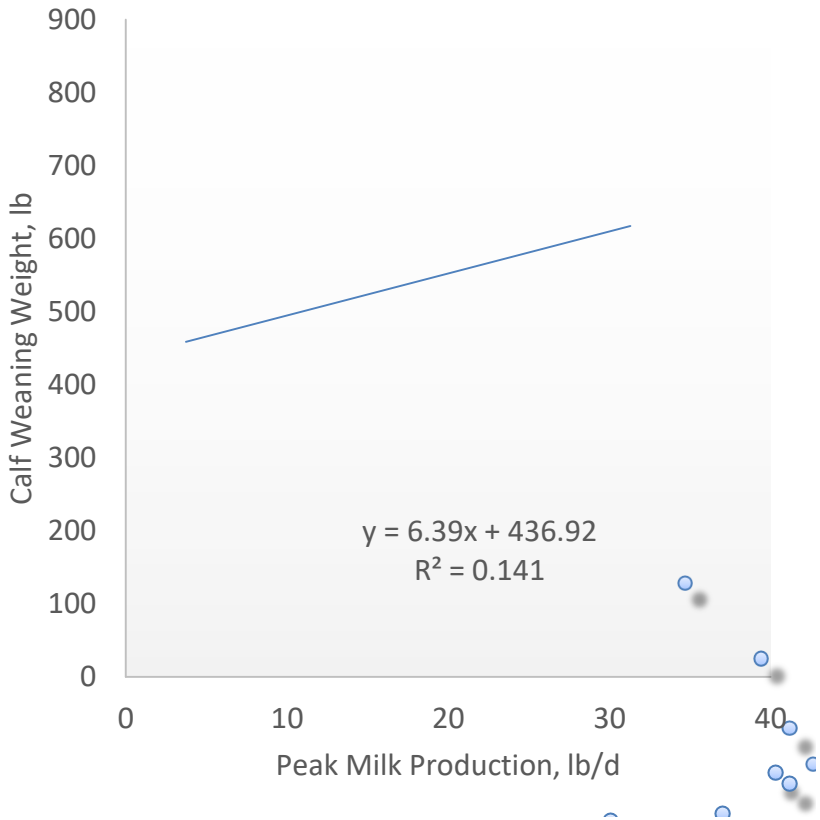
Milk influence in different environments

Humid Environment - Tennessee



Semi-arid Environment – Nebraska



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Impact of Milk on Calf Weaning Weight

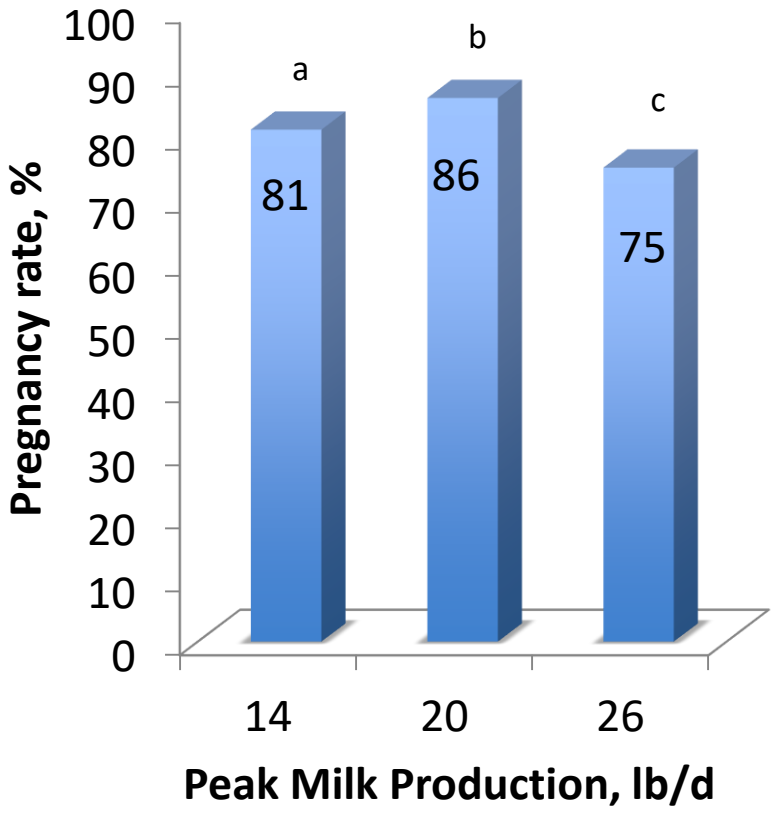
- Milk drives calf growth up to peak lactation
  - Highly variable response post peak lactation

- Forage quality after peak lactation impacts growth
  - Forage intake can offset lack of milk
    - High vs Low forage quality

Selection for Milk Impacts More than Calf Growth

What about the entire production system??

Increased Milk Can Decrease Pregnancy Rates

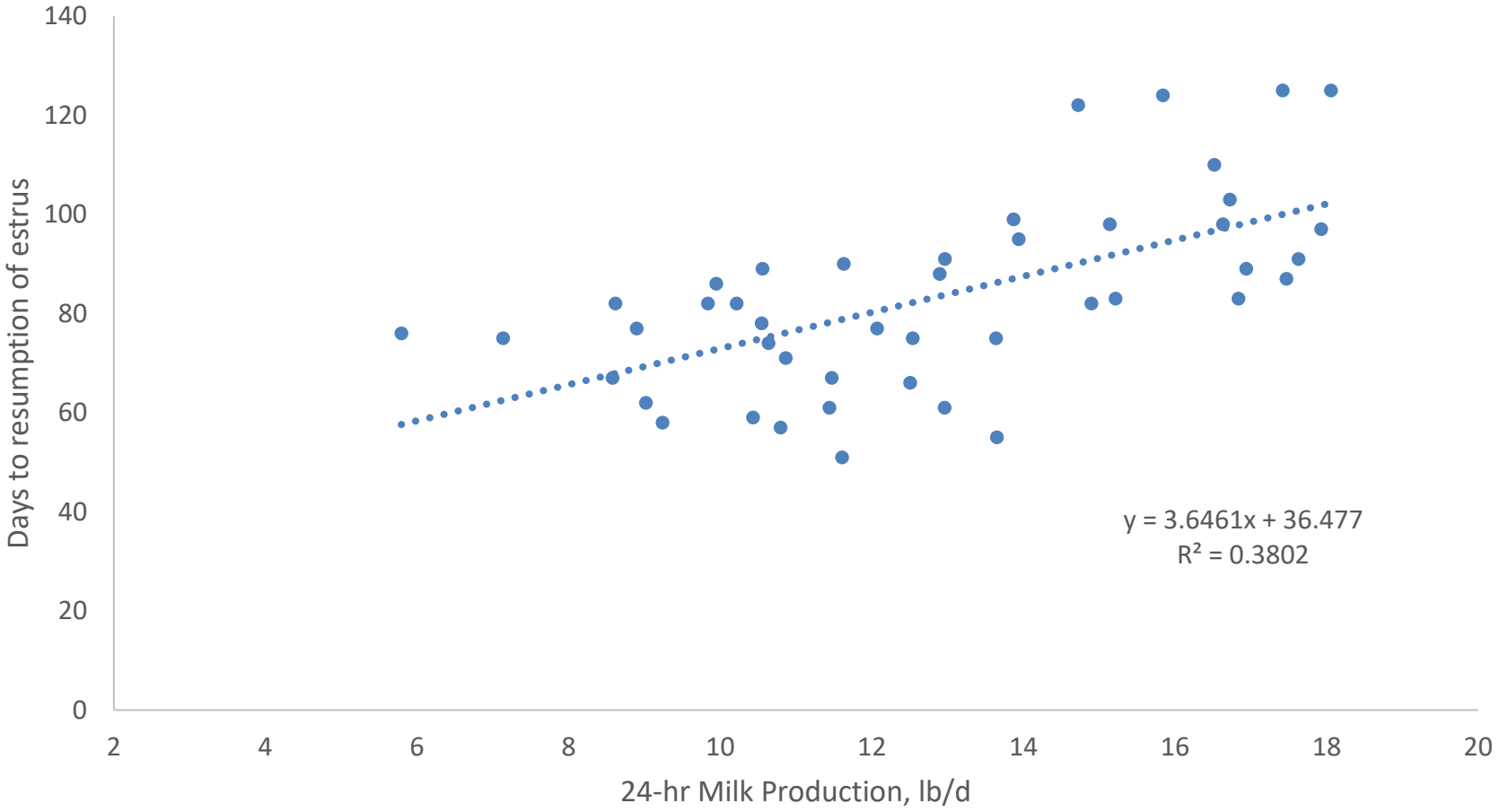


P = 0.03

- 237 Spring-calving Angus cows
- Fed high-quality forage diet

Edwards et al., 2017

Milk Production and Resumption of Estrus in Young Cows In NM



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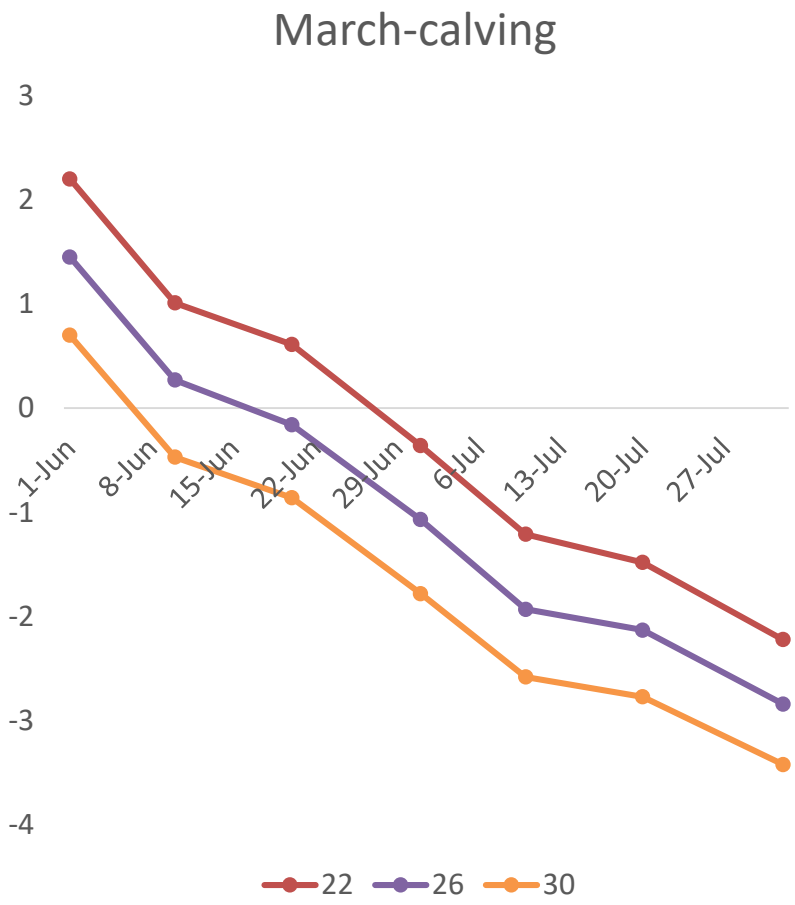
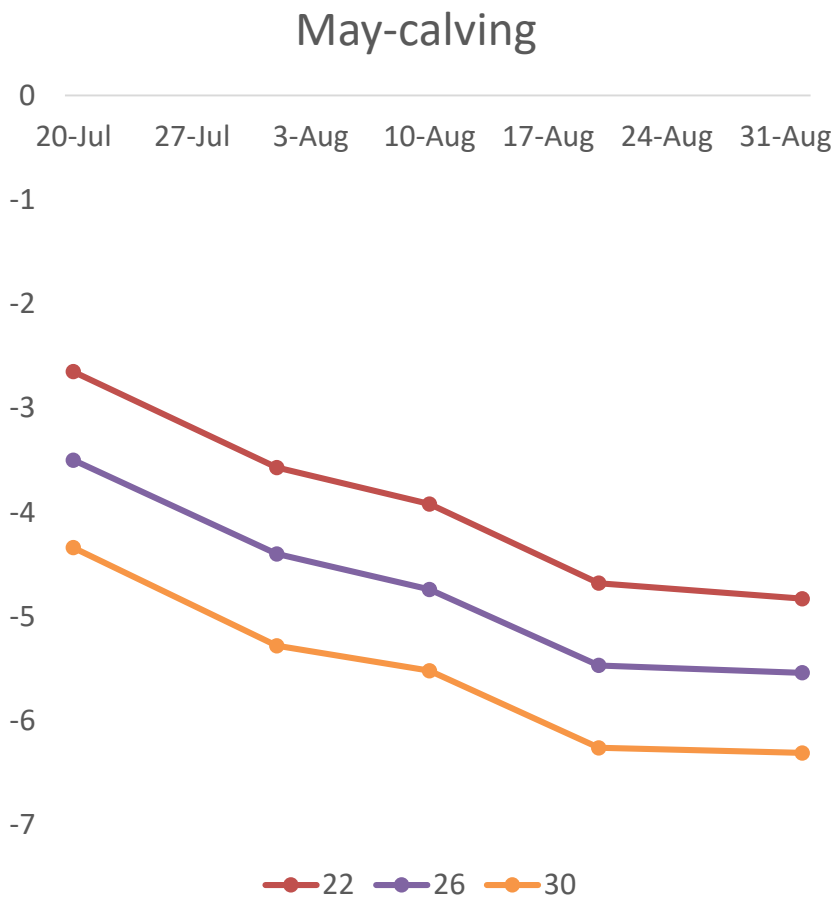
Mulliniks et al. 2020

Net energy balance during breeding by calving season in Nebraska Sandhills





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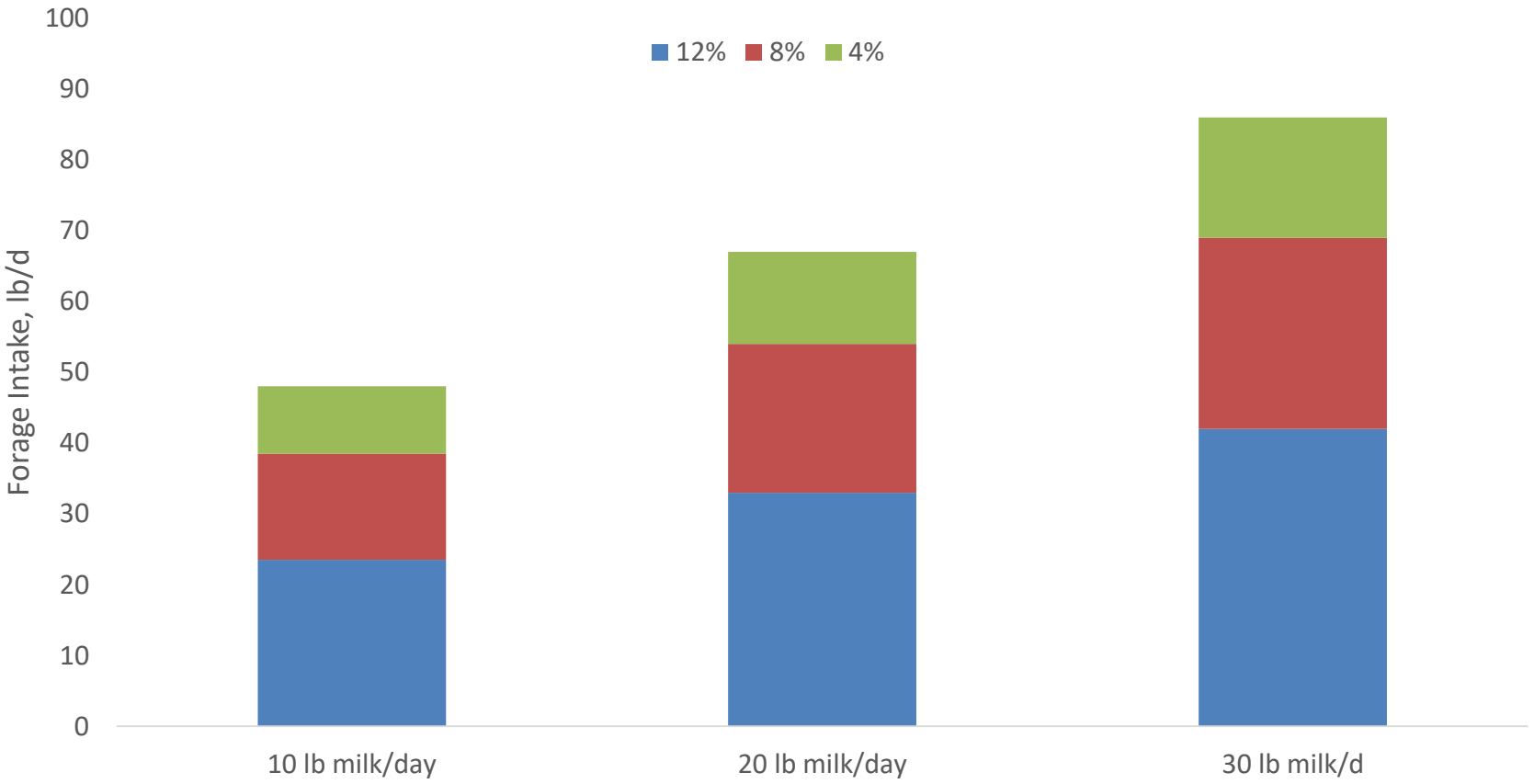
Mulliniks and Adams, 2019

Forage Intake Needed to Meet Protein Requirements for Milk



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Comparison of Genetic x Environment on Productivity

Tennessee

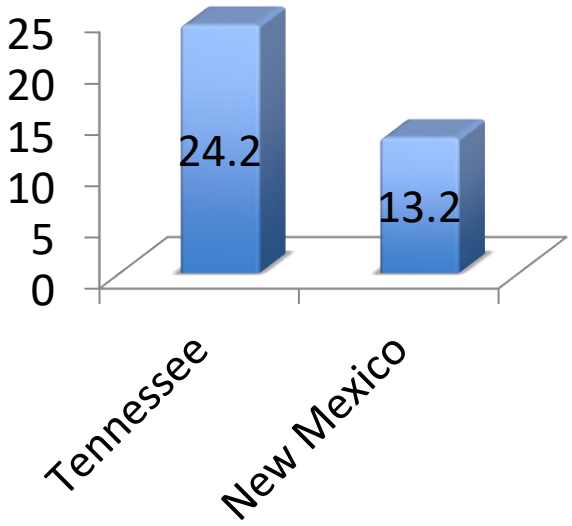
- High growth potential
- High milk potential
- High forage growth and feed input

New Mexico

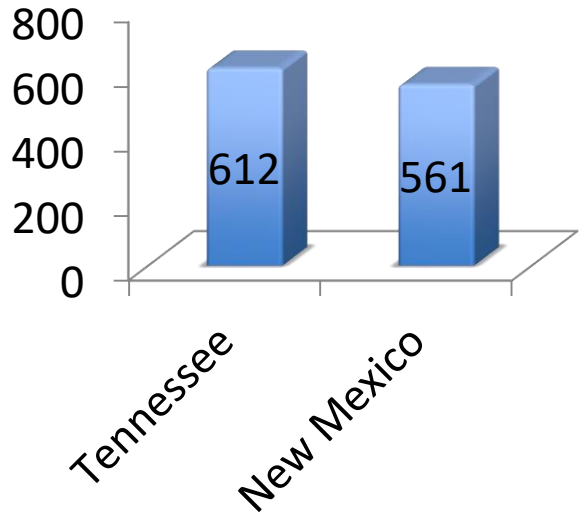
- Moderate growth
- Low milk potential
- Limited forage availability
- Low feed input

Milk Production and Calf Weaning Weight in Two Different Environments

24-hr Milk Production, lb



Calf Weaning Weight, lb



TN: 25 lb Calf Weaned/1 lb of Milk
NM: 43 lb Calf Weaned/1 lb of Milk

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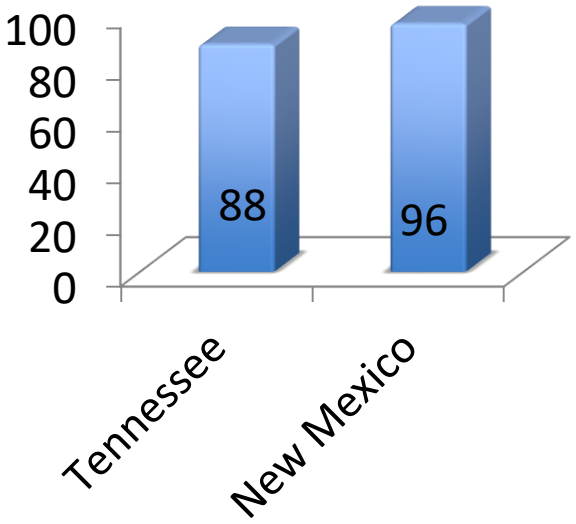
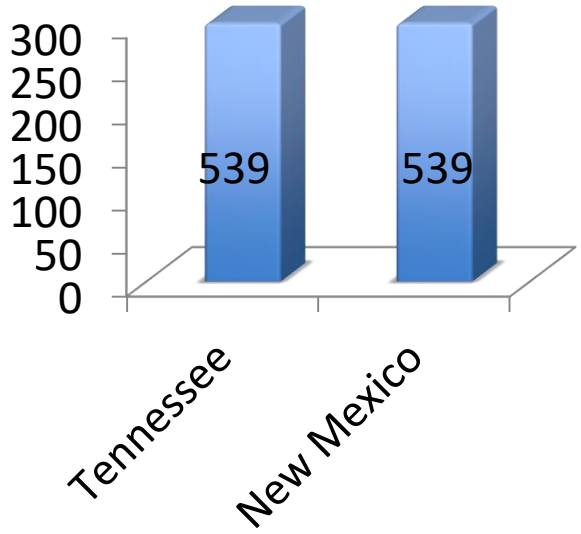
Pregnancy Rate and Pounds of Calf Weaned Per Cow Exposed

Pregnancy Rate, %



Pounds of Calf Weaned Per Cow Exposed



NM vs TN Evaluation

- Take into account cow retention
  - 61% retention rate at 5 yr of age in NM
  - 44% retention rate at 5 yr of age in TN

- Cost of production
  - Lower cost of production in NM
    - ~$300 – 400 decrease in cost of production

Effect of Milk on Feedlot Performance

Item	Low	Moderate	High	SEM
Days	205	205	205	--
Initial BW, lb	539	548	570	29
Gain, lb/d	2.90	2.82	2.86	0.13
DMI, lb/d	18.41	18.90	19.00	0.59
Gain/feed	**0.157**	**0.149**	**0.150**	0.07

Lewis et al. 1990

Increased Energy Requirements = Decreased Feedlot Efficiency!

Conclusion

- We have a tendency to overdue things
  - Larger milking cows increase production risks, increase costs
- Matching cows to the environment
  - Balancing act

Increasing Milk Increases Risk

- Minimal Increase in Calf Growth
  - Potential for no increase in calf growth
- Feed resources may limit expression of milk
- Production System Impact
  - May decrease reproductive efficiency
  - May decrease post-weaning calf efficiency
  - Production costs increase

Questions

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