



***Relationship of Cow Size,
Requirements, and Production
Issues***

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How Big are Your Cows

- I don't know..... why does it matter?
- The herd runs 1,000 to 1,150 lbs
 - *Really how do you know*
- My cows average about 1,000 lbs
 - *What's the spread 800-1,200 lb*
- My cull cows averaged 975 lbs, so my herd is a good size
 - *Why were they culled, do they represent the herd*

Why Should We Care About Cow Size?

- Relationship between Cow Size/Body Weight
 - Feed Intake Potential
 - Nutrient Requirements
 - Pasture Stocking Density
 - Cow Performance
 - Productive Output = calves
- Stored and Supplemental Feed**

Enterprise Profitability!

What affects cow nutrient requirements

- Nutrient requirements differ:
 - Age
 - Level of production
 - Current and/or desired body condition
 - Current and/or mature body weight
 - Breed
 - Physiology
 - Pasture activity
 - Pest load
 - Feed Additives
 - Environment
 - Temperature
 - Season

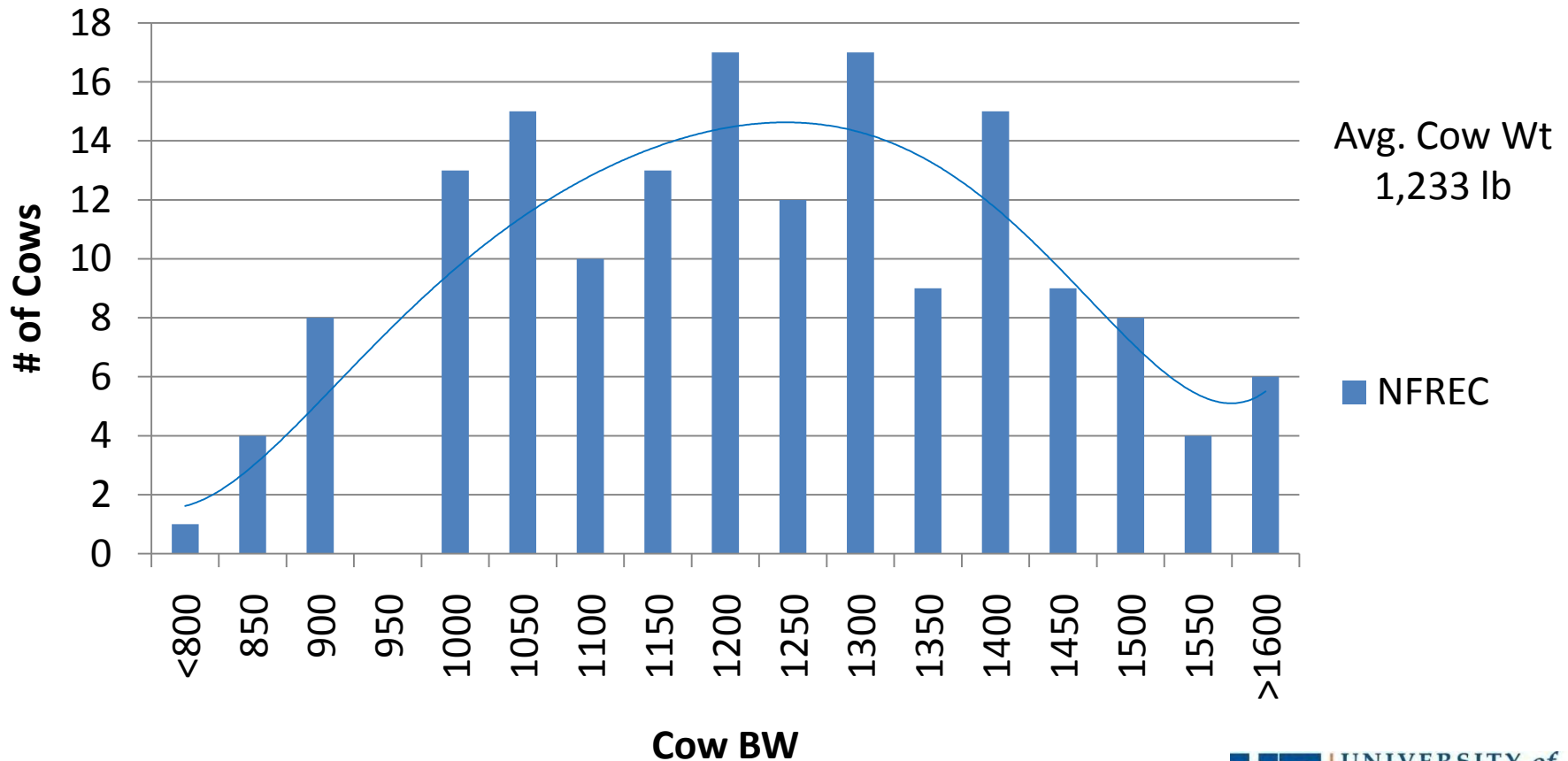


Aren't All Cows 1,000 lbs?



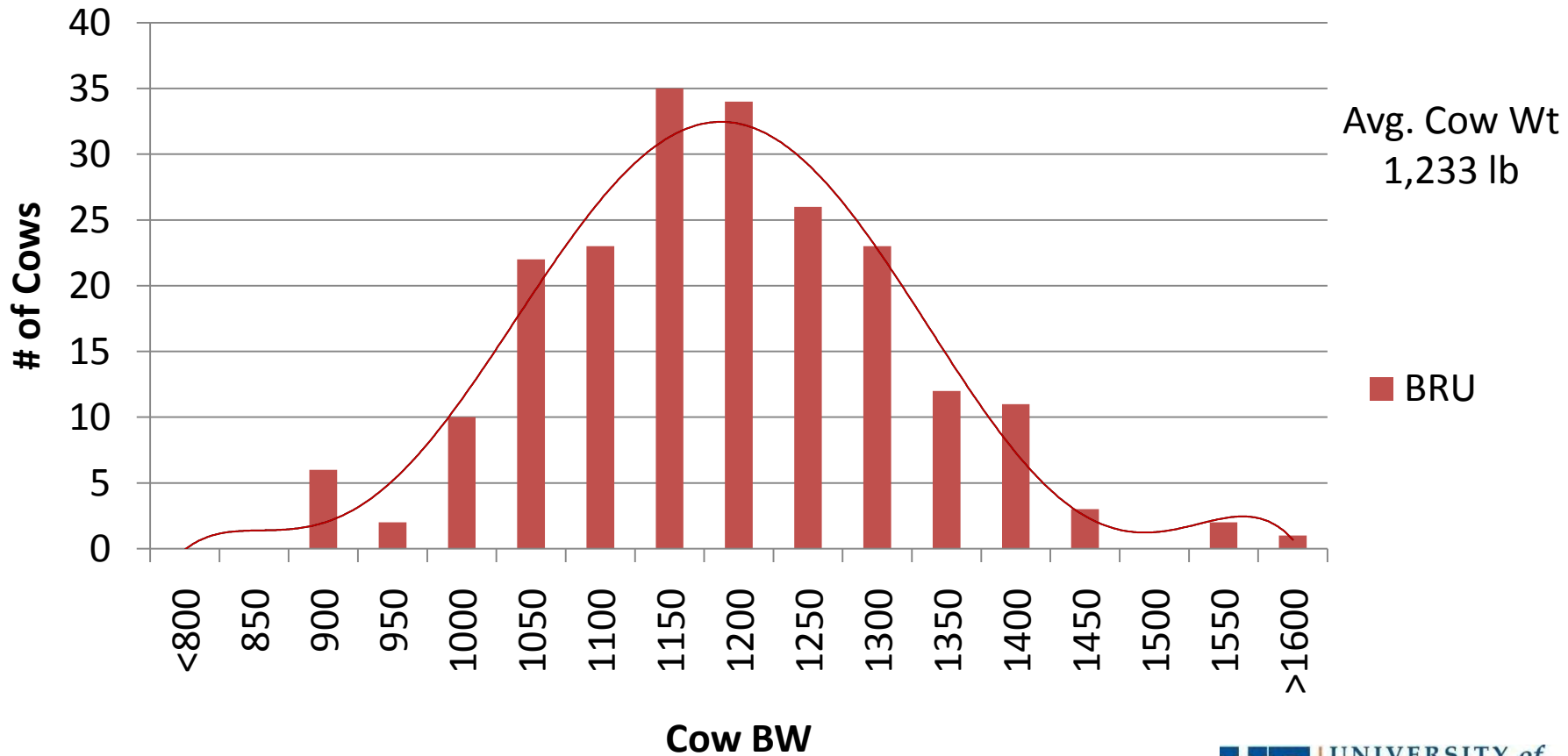
Cow BW Distribution

NFREC



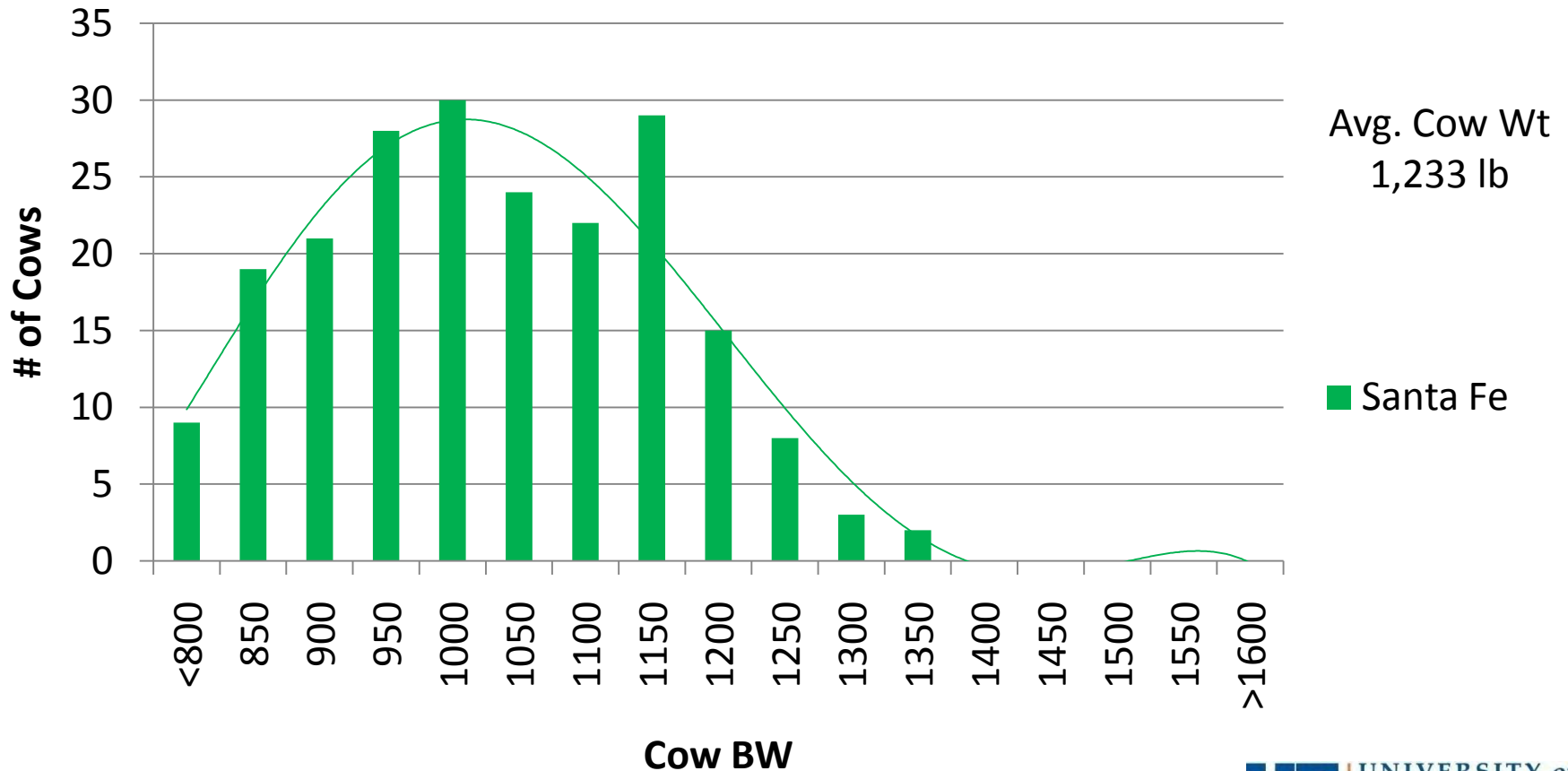
Cow BW Distribution

BRU

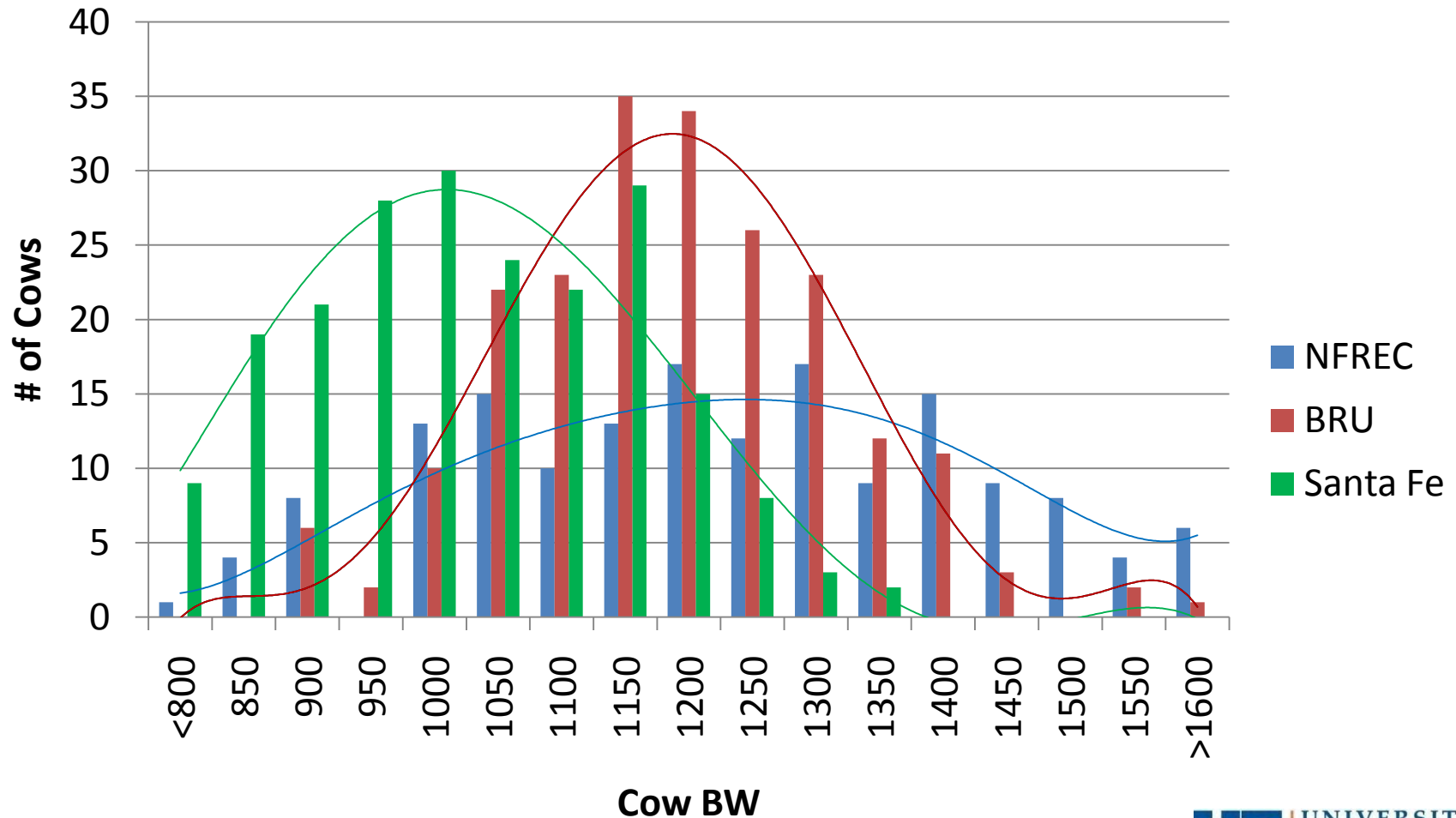


Cow BW Distribution

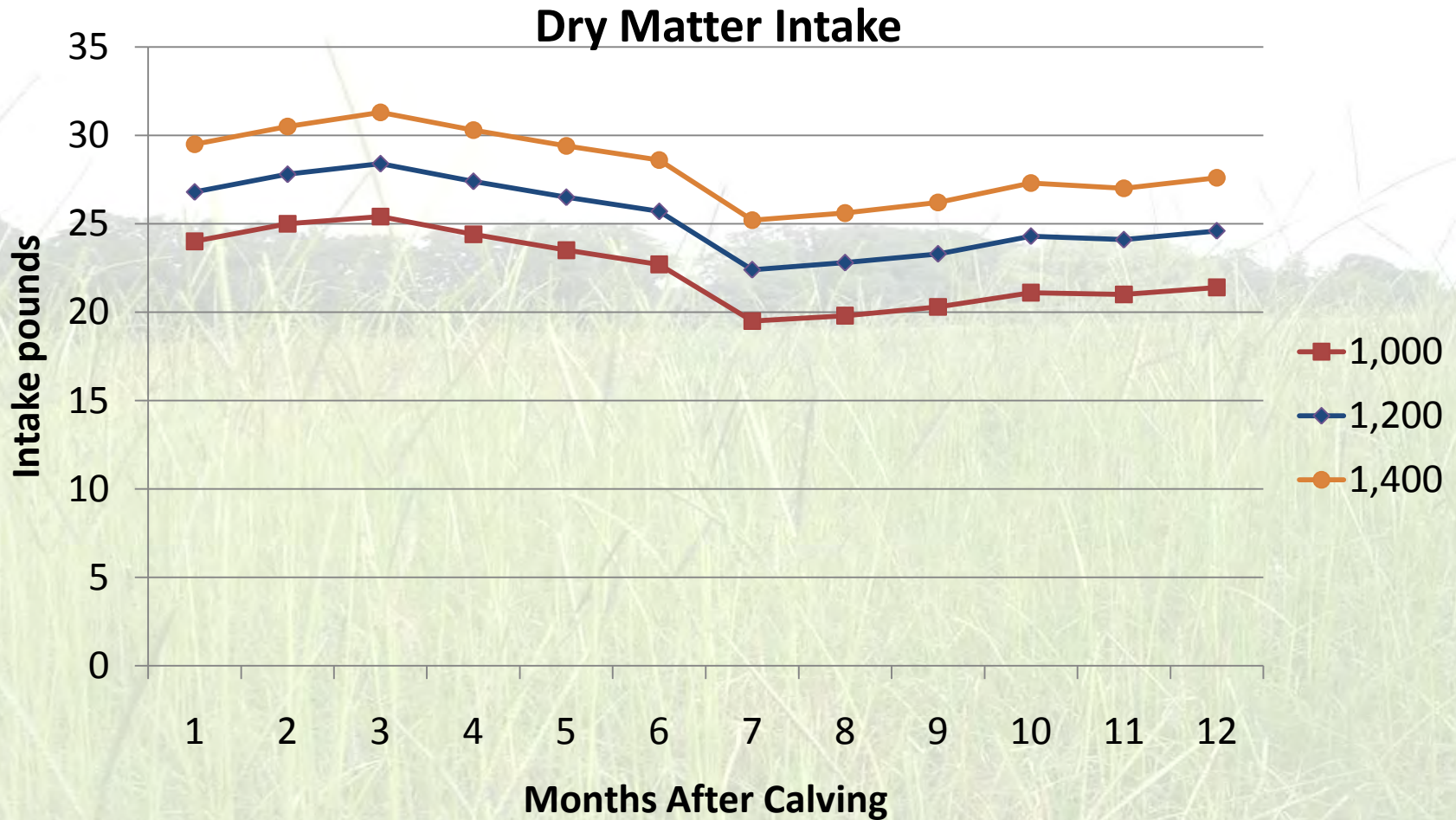
Santa Fe



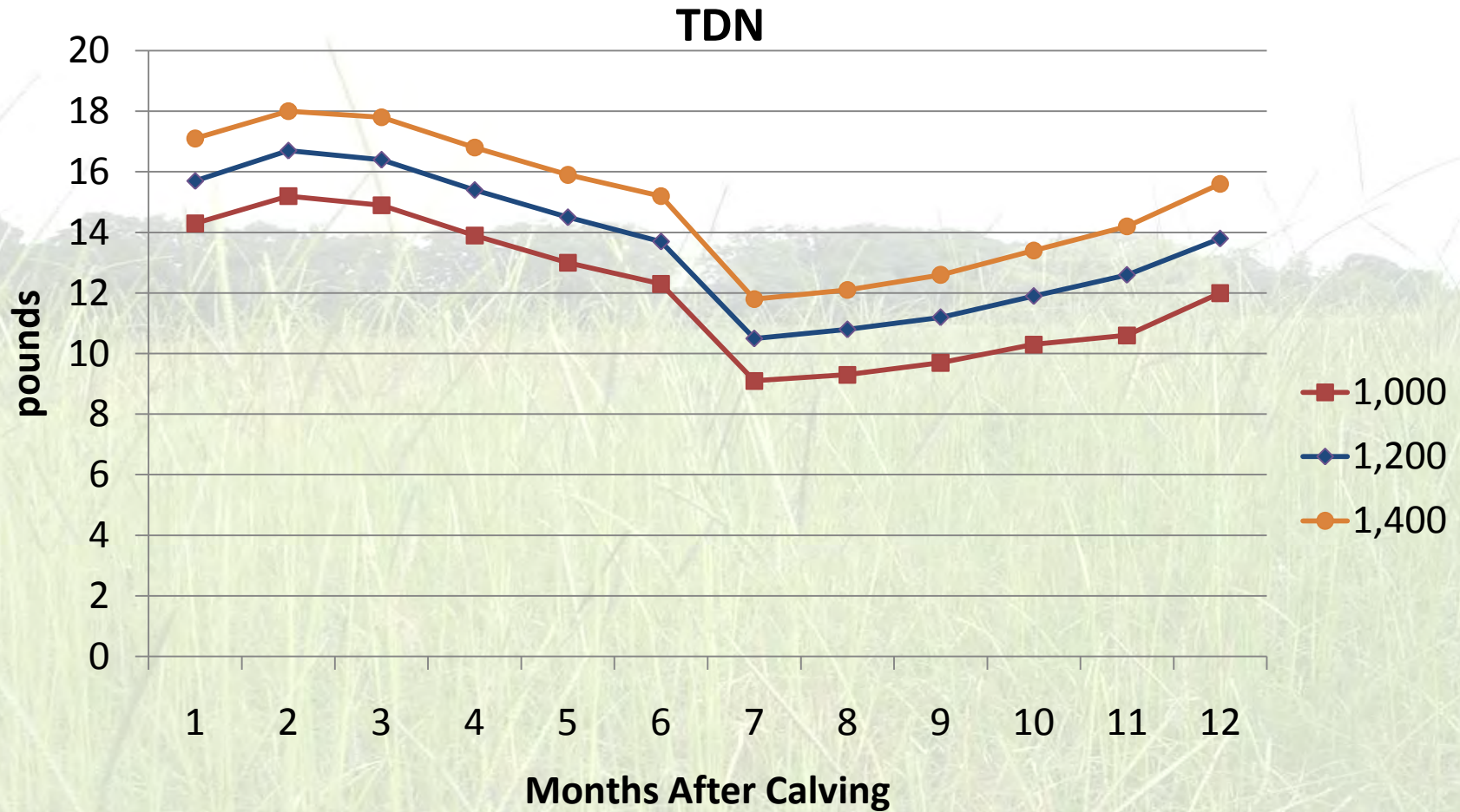
Cow BW Distribution



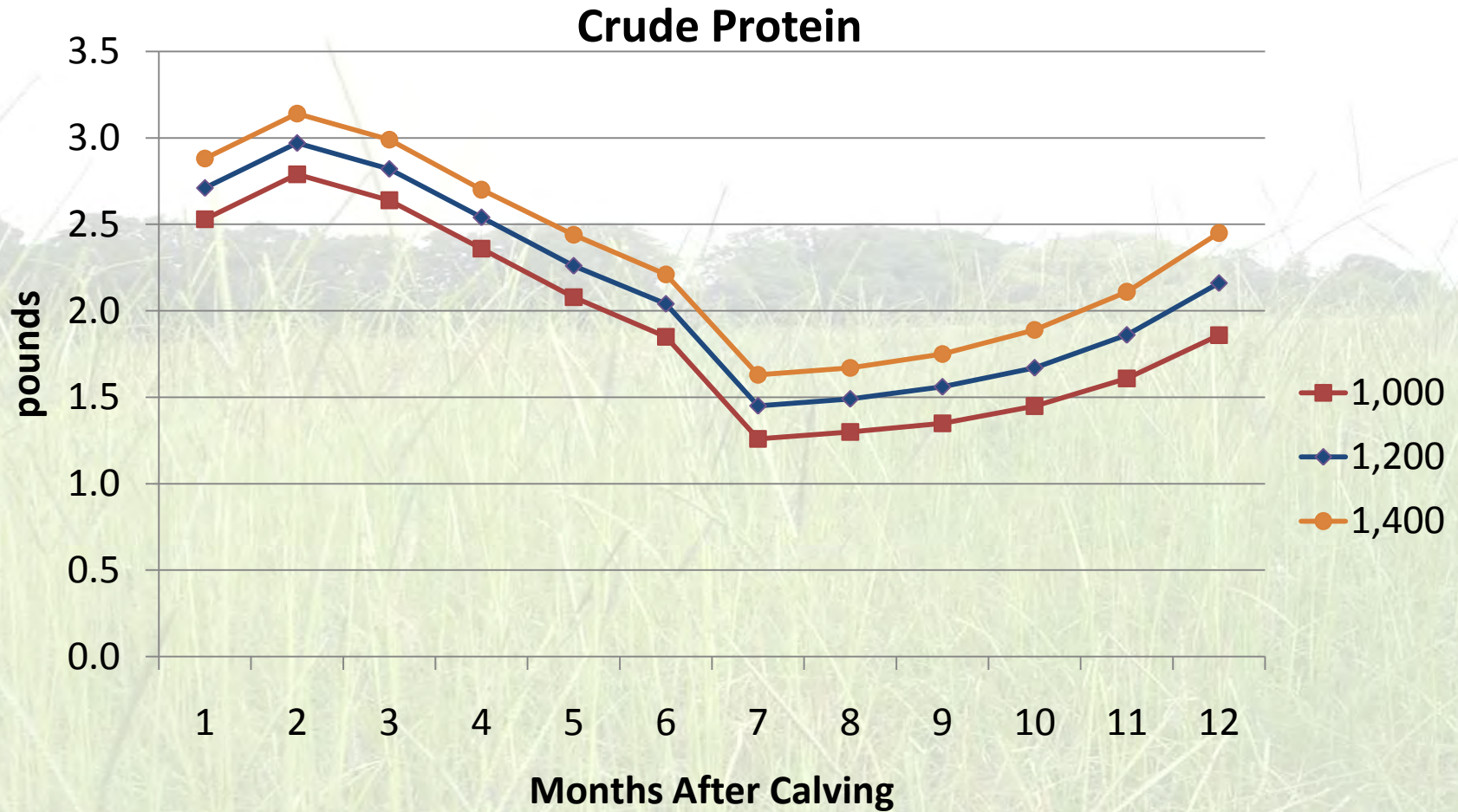
Effect of Cow BW on Feed Intake



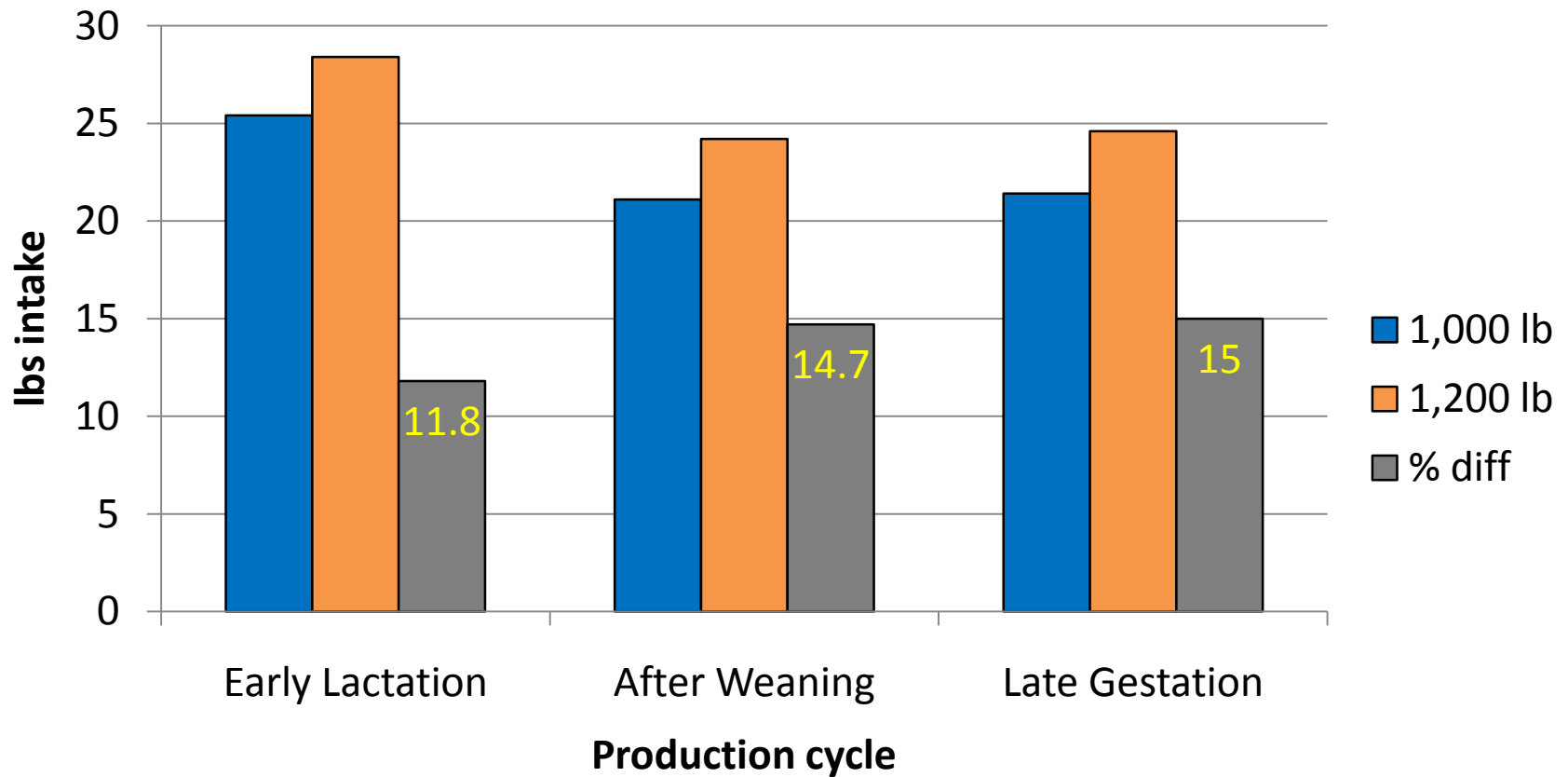
Effect of Cow BW on Feed Intake



Effect of Cow BW on Feed Intake



Relationship of Cow BW to Intake



Life-Resembling Situations

- 1,000 vs. 1,200 cow
- Defined production periods
 - 3 month after calving
 - After weaning
 - Late gestation
- Feeding Situations
 - Total hay feeding
 - Pasture feeding
 - Pasture carrying capacity

Life-Resembling Situations

Feed Amounts

3 month After Calving

Cow BW	DMI, lb 1 day	DMI, lb 30 days	100 Cow Herd, 30 d DMI	Hay Needed, lb 90% DM	20% Waste, Hay lb	1,000 lb Bales
1,000	25.4	762	76,200	84,667	101,600	102
1,200	28.4	852	85,200	94,667	113,600	114
				Pasture Needed, lb 50% DM	2,000 lb/ac forage mass, acres	Acres /cow
				152,400 / 304,800	152.4	1.52
				170,400 / 340,800	170.4	1.70

12% increase

Life-Resembling Situations

Pasture Area

3 month After Calving

- 100 acre pasture
 - 50% DM pasture = 1,000 lb/ac DM available
 - 50% utilization = 50,000 lb DM available to consume
 - 1,000 lb cow = 66 cows for 30 days
 - 1,200 lb cow = 59 cows for 30 days
 - 11.8% increase in cows stocked

Life-Resembling Situations

Feed Amounts

After Weaning

Cow BW	DMI, lb 1 day	DMI, lb 30 days	100 Cow Herd, 30 d DMI	Pasture Needed, lb 30% DM	2,000 lb/ac forage mass, acres	Acres /cow
1,000	21.1	633	63,300	211,000/ 422,000	64	0.63
1,200	24.2	726	72,600	242,000/ 484,000	73	0.73

10% increase

Life-Resembling Situations

Pasture Area

After Weaning

- 100 acre pasture
 - 30% DM pasture = 2,000 lb/ac DM
 - 50% utilization = 100,000 lb DM available to consume
 - 1,000 lb cow = 158 cows for 30 days
 - 1,200 lb cow = 138 cows for 30 days
 - 14.5% increase in cows stocked

Life-Resembling Situations

Feed Amounts

Late Gestation

Cow BW	DMI, lb 1 day	DMI, lb 30 days	100 Cow Herd, 30 d DMI	Pasture Needed, lb 40% DM	1,500 lb/ac forage mass, acres	Acres /cow
1,000	21.4	642	64,200	160,500 / 321,000	85.6	0.86
1,200	24.6	738	73,800	184,500 / 369,000	98.4	0.98

15% increase

Life-Resembling Situations

Pasture Area

Late Gestation

- 100 acre pasture
 - 40% DM pasture = 1,500 lb/ac DM
 - 50% utilization = 75,000 lb DM available to consume
 - 1,000 lb cow = 117 cows for 30 days
 - 1,200 lb cow = 102 cows for 30 days
 - 14.7% increase in cows stocked

Production Parameters

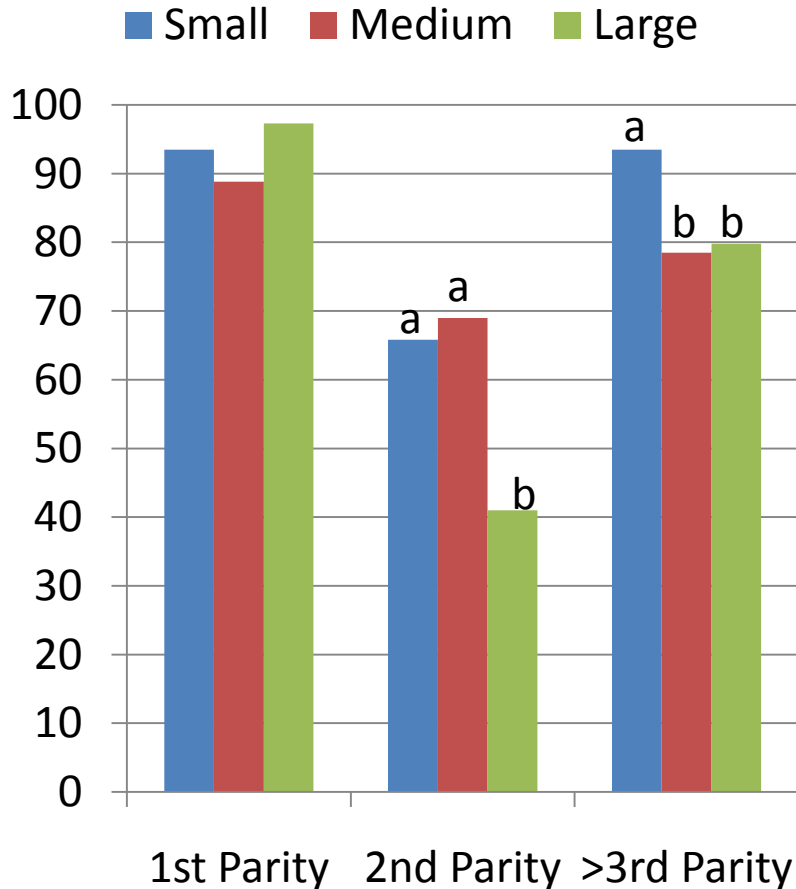


Cow Size Production Issues

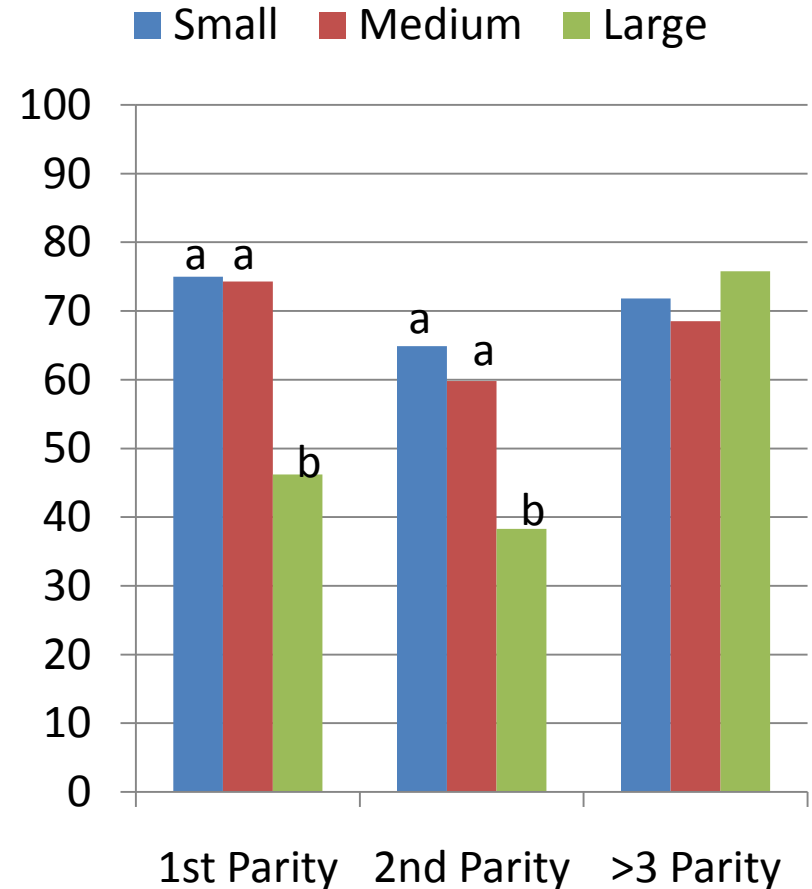
- Small cows don't perform as well
- Small cows don't wean enough calf
- Small cows have poorer calves
- Calves from small cows don't produce adequate carcasses

Effect of Cow Size on Production Traits

Calving Rate, %



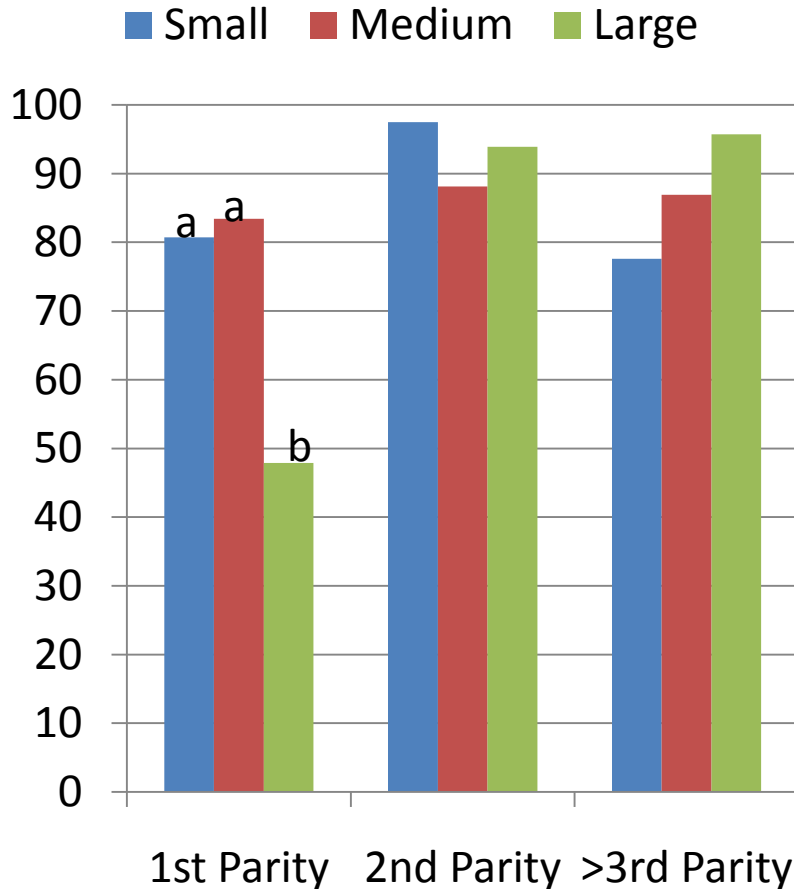
Weaning Rate, %



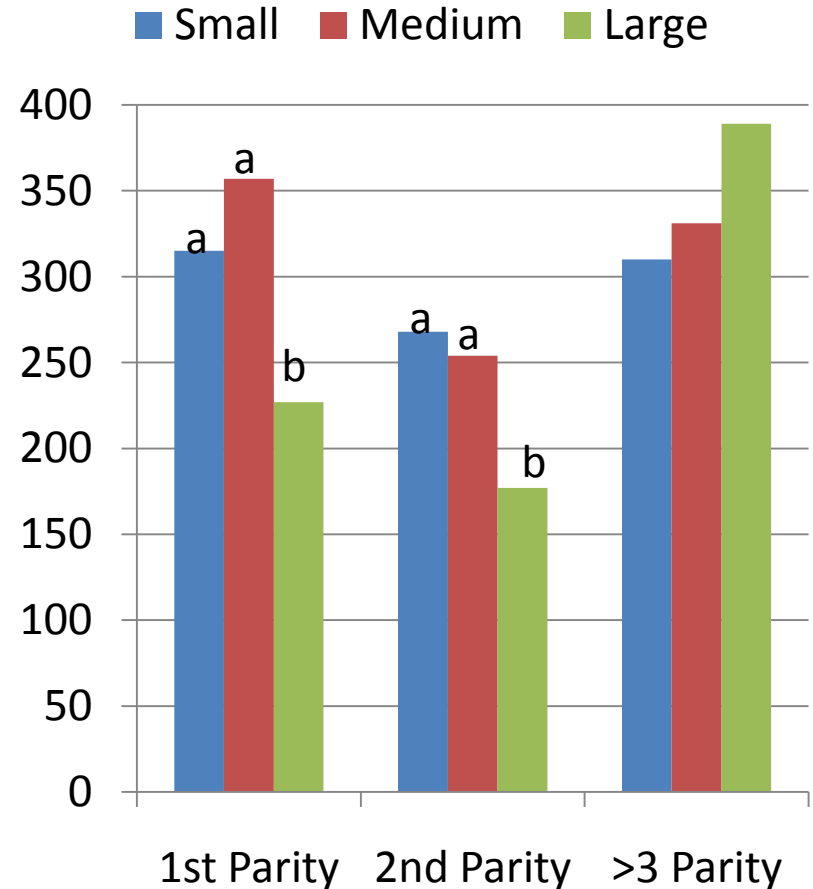
^{a,b} Means with different superscripts differ $P < 0.05$
Adapted from Vargas et al., 1999.

Effect of Cow Size on Production Traits

Survival Rate, %



Production/cow, lb



^{a,b} means with different superscripts differ $P < 0.05$
Adapted from Vargas et al., 1999.

Effect of Cow Body Size on Production Parameters and Offspring

Cow Body Size

Item	Small	Medium	Large	Very large
Cow BW, lb	993	1,139	1,249	1,425
% Pregnant	87.2	89.5	92.1	87.5
% Weaned	85.0	76.8	86.7	76.7
Weaning Wt, lb*	391	443	442	413
Pre-wean ADG*	1.54	1.70	1.74	1.67
Post-wean ADG	3.13	3.13	3.13	3.08
Hot carcass wt	655	657	655	652
Dressing %	61.2	61.4	61.1	60.9
Ribeye area*	12.5	12.4	12.5	11.6
% Choice	86.3	85.9	85.7	83.9

* Significant effect of cow body size.

Adapted From Olson et al. 1982

Effect of Cow Body Size on Calf Weight at Weaning - UF

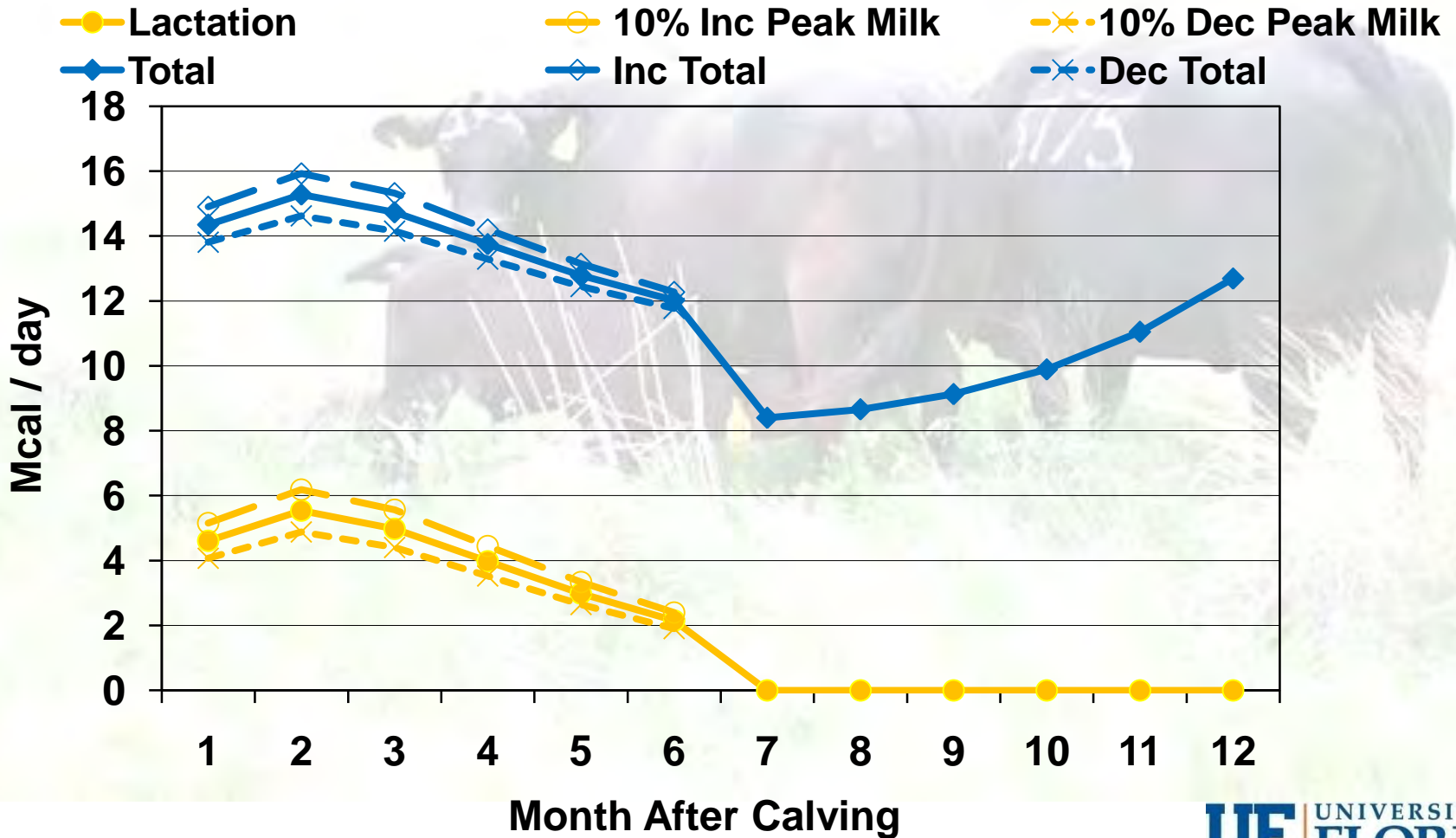
		NFREC	BRU	Santa Fe
Heaviest Cow	Cow weight	1,750	1,650	1,380
	Calf wean weight	578	446	483
	% of cow weight	33	27	35
Lightest Cow	Cow weight	808	902	806
	Calf wean weight	412	433	451
	% of cow weight	51	48	56
Average Cow	Cow weight	1,233	1,215	1,053
	Calf wean weight	567	620	584
	% of cow weight	46	51	55

Milk Production – Related Issue

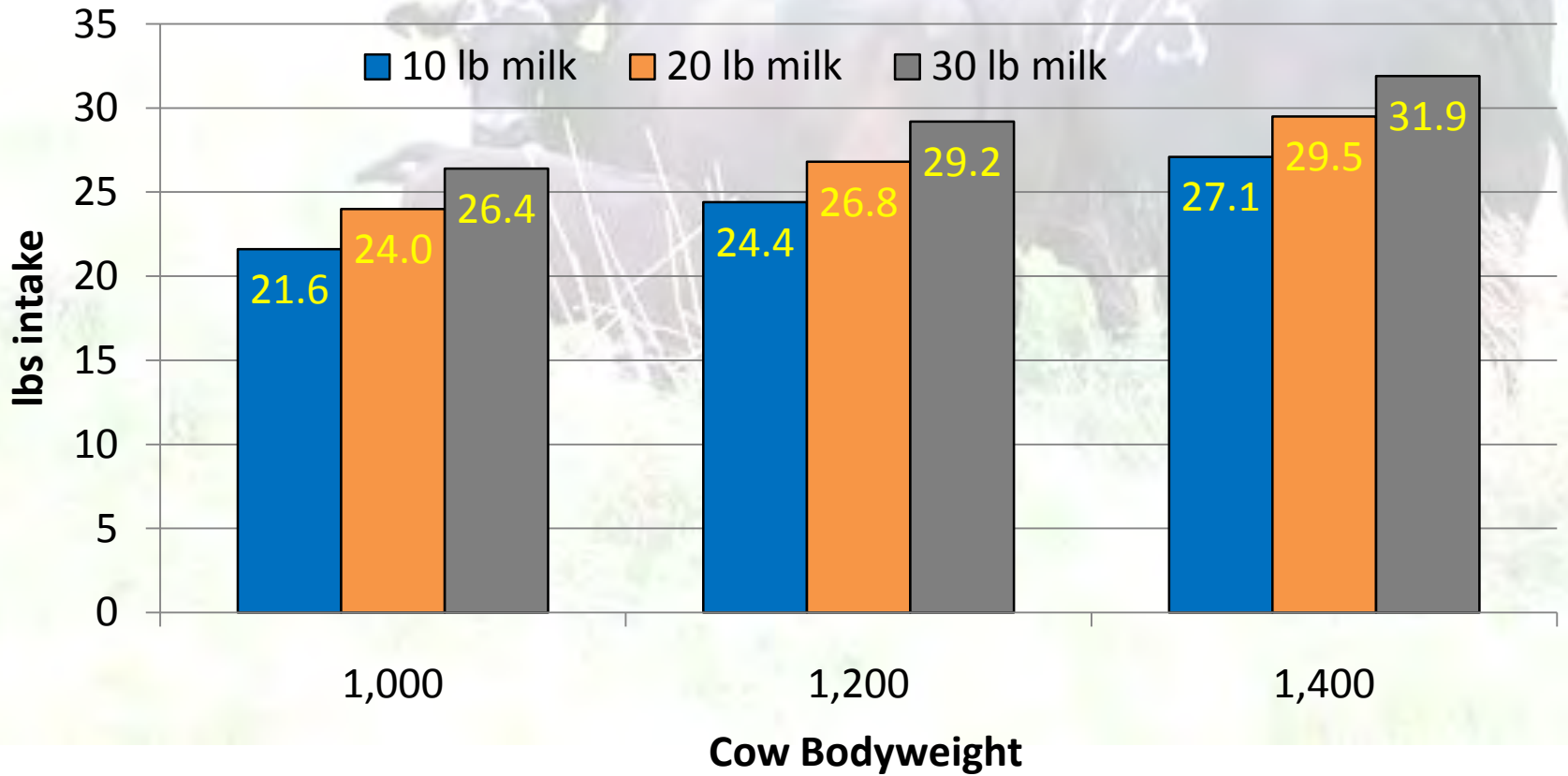
- Lactation: Increases maintenance energy requirement by 20% during lactation
- Milk Yield:
Near 1:1 change in NE_L
and milk yield
- Age: yield potential
2-yr (74%)
3-yr (88%)



NRC Predicted Monthly Net Energy Requirement – Milk Yield



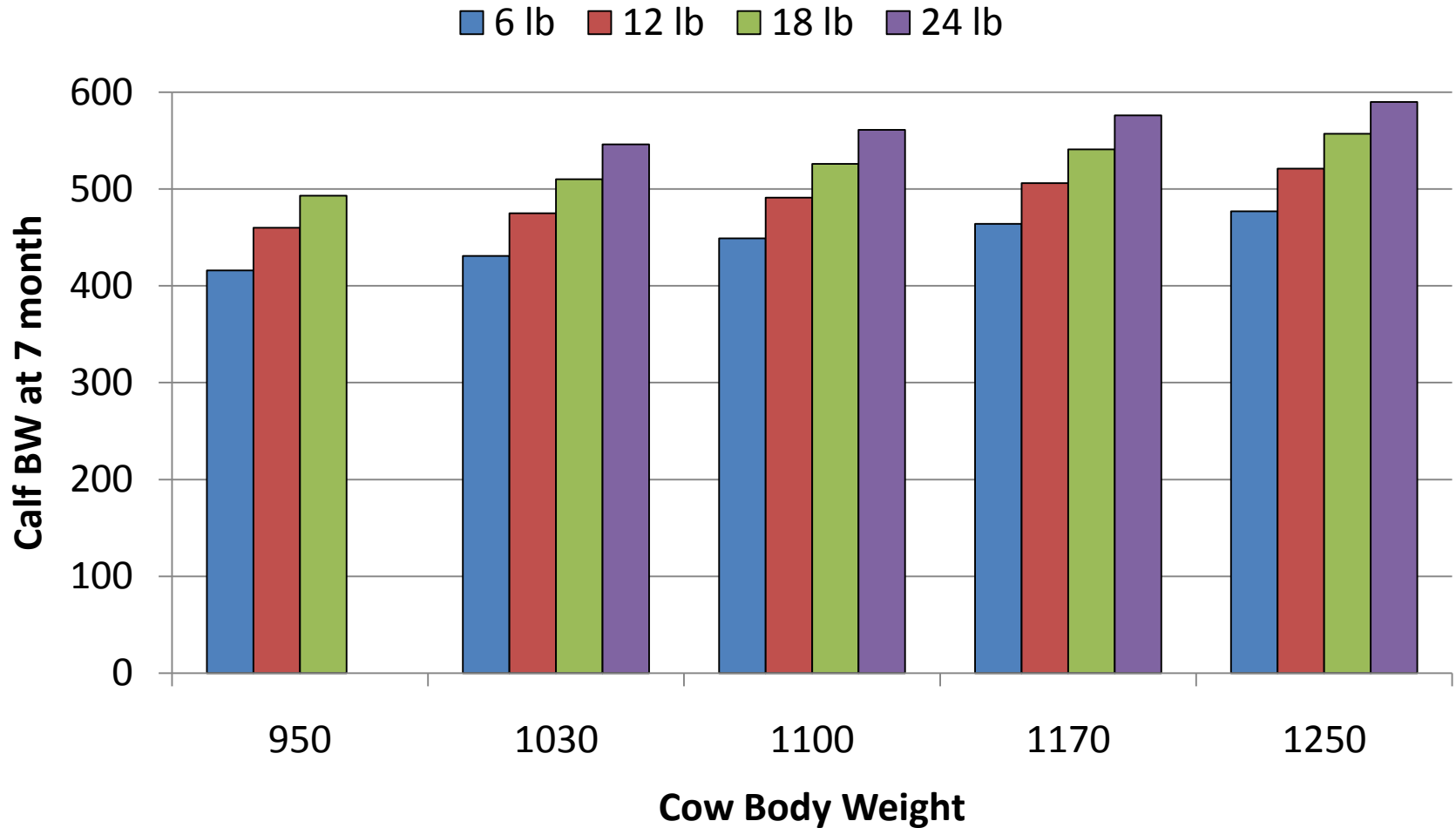
Relationship of Cow BW and Milk Potential to Intake



Milk Production

- How to estimate milk production?

Predicting Cow Peak Milk Yield



15 lb calf wt increase as cow wt increases within milk production

Milk Production

- How to estimate milk production?
- Selection for weaning wt % selects for milk production
- Can the system sustain high BW-Milk cows
- 10 lb of milk = 10% increase in feed energy
 - Like feeding a 200 lb heavier cow

Managing Cow Size

- Smaller cows eat less
- Need less total energy and protein
- More cows per unit land area
- More calves produced per unit land area
- Smaller cows are more efficient
- Is Hersom advocating 1,000 lb cows?
 - Not necessarily
 - Aware of the implications of Cow Size

Managing Cow Size

- Match cows to the environment – nutritional
- Don't just select for weaning % of cow BW = milk production
- Get the size and growth from the bull
- Considerations for replacement heifers
- Emphasize total pounds produced, not individual calf pounds produced

Questions

Profit lies in optimization of expenses and revenues, and optimization is always more challenging than maximizing outputs or minimizing inputs.

