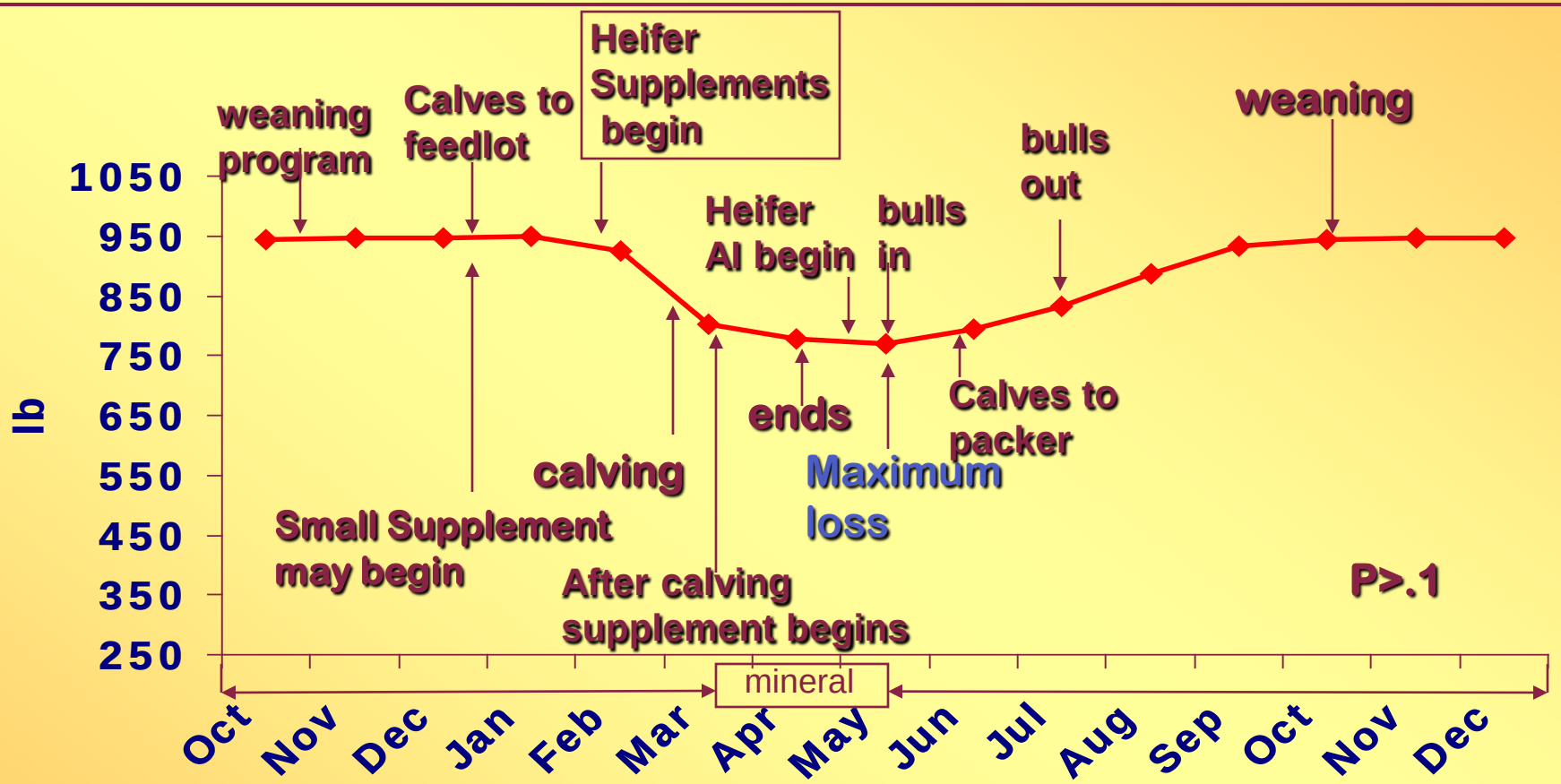
Developing strategy - Protein

- MAXIMUM
  - 36% crude protein (CP) supplement
    - 50% rumen degradable
    - Oil seed meal plus high ruminally undegradable
    - 6% CP equivalents from urea
  - Target 2.0 lbs/hd/d
    - Fed every other day, 3X or 2X/wk
    - costs $0.50/d
  - Most effective during rapid body weight loss
    - After calving

Developing strategy - Protein

- MAXIMUM – bypass protein sources
  - Fish meal
  - Corn Gluten meal
  - Distillers dried grains
  - Feather meal
  - Pig blood meal

Cost Effective Supplementation in a management year as practiced at CRLRC



Using MAXIMIUM Supplement with range raised heifers

- Perceived problems ranch raised heifers
  - Range raised heifers tend to be under developed
  - don't get pregnant
  - get pregnant and have problems calving
  - don't rebreed
  - Spend $ on feed to reach target

Corona Range & Livestock Research Center
Range Raised Heifers

- **Four years +**
- **Supplemented with**
  - **2 lb/d of Moderate or Max**
  - **compared to feedlot**

- **Evaluate supplementation starting dates**
  - **November vs February**

Hawkins et.al.

Traditional November Supplementation

Heifer body weights (lb) and pregnancy data (97-98; 98-99)

November start	Maximum* (n = 57)	Moderate (n = 56)	+ SE
October	517	513	5.5
May	572	585	5.5
Pregnancy rate	81%	66%	

Hawkins et.al.

* Maximum=50% DIP & 50% UIP

Delayed February Supplementation

Heifer body weights (kg) and pregnancy data (94-95; 96-97)

February start	Maximum* (n=65)	Moderate (n=61)	± SE
October	504	515	7.7
May	559	539	7.6
Pregnancy rate	79%	67%	

Hawkins et.al.

* Maximum=50% DIP & 50% UIP

Enterprise Budget, for heifer development 10 year average

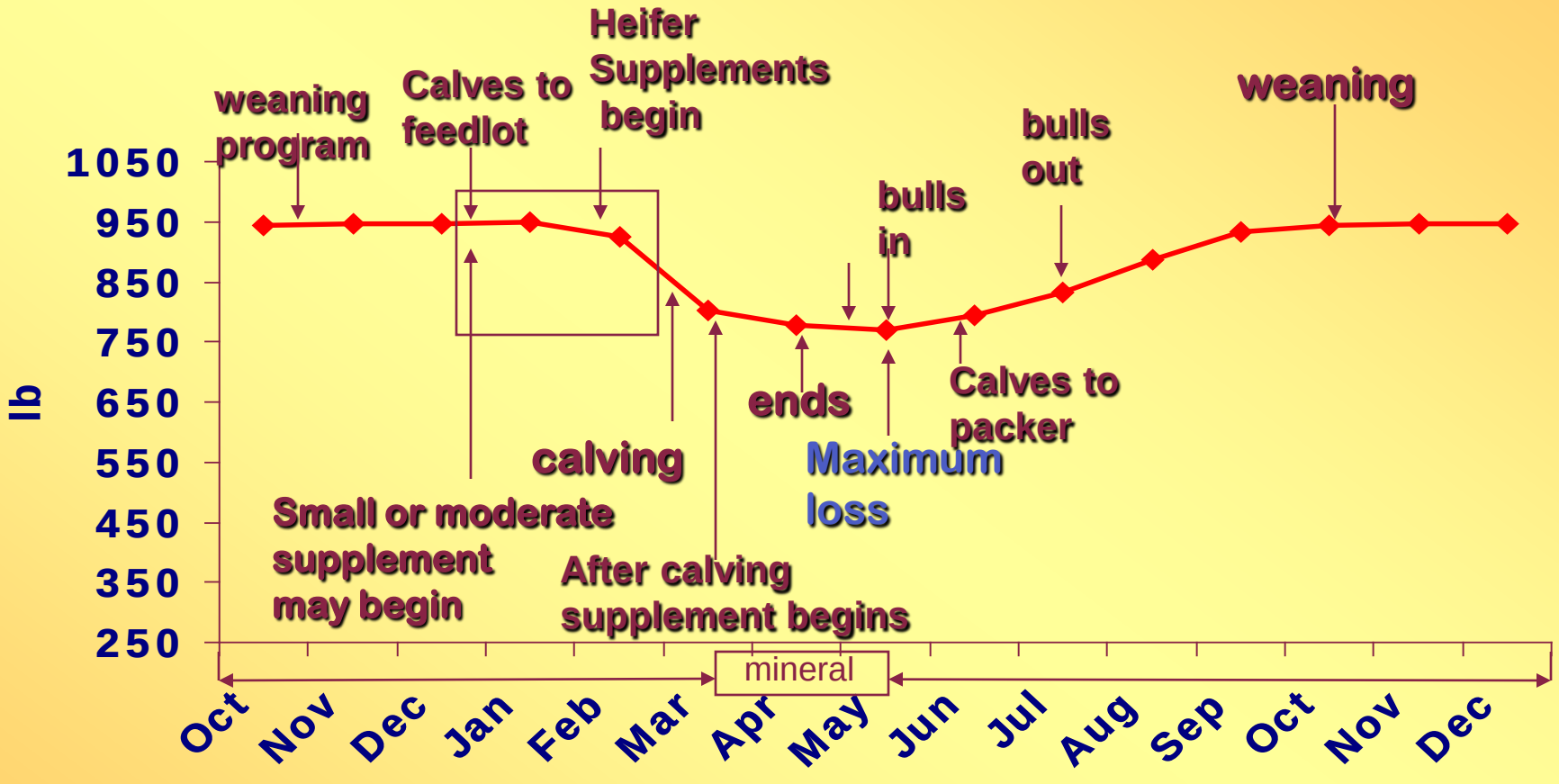
Item	Feedlot	Ranch
Conception, %	88	71
Value at weaning$	446.35	446.35
Total Costs $	765.44	708.40
Gross Income $	793.16	798.96
Net Income $	27.72	90.54

Sawyer et al., 2001

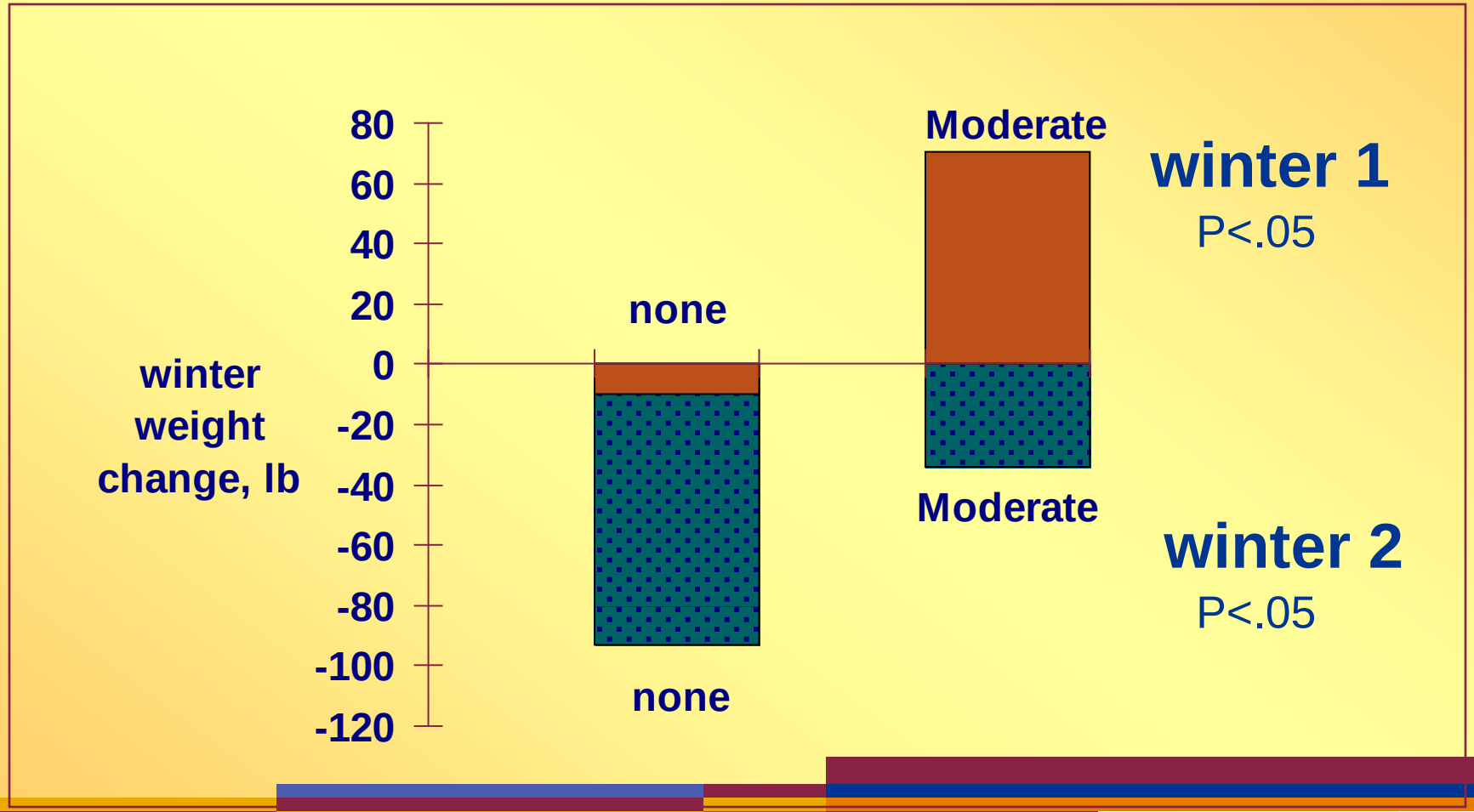
Characteristics of strategically developed heifers

- Expect 15% higher pregnancy rate using a maximum type supplement
- If top pregnancy rate for heifers is not required, then ranch raised heifer may cost less.

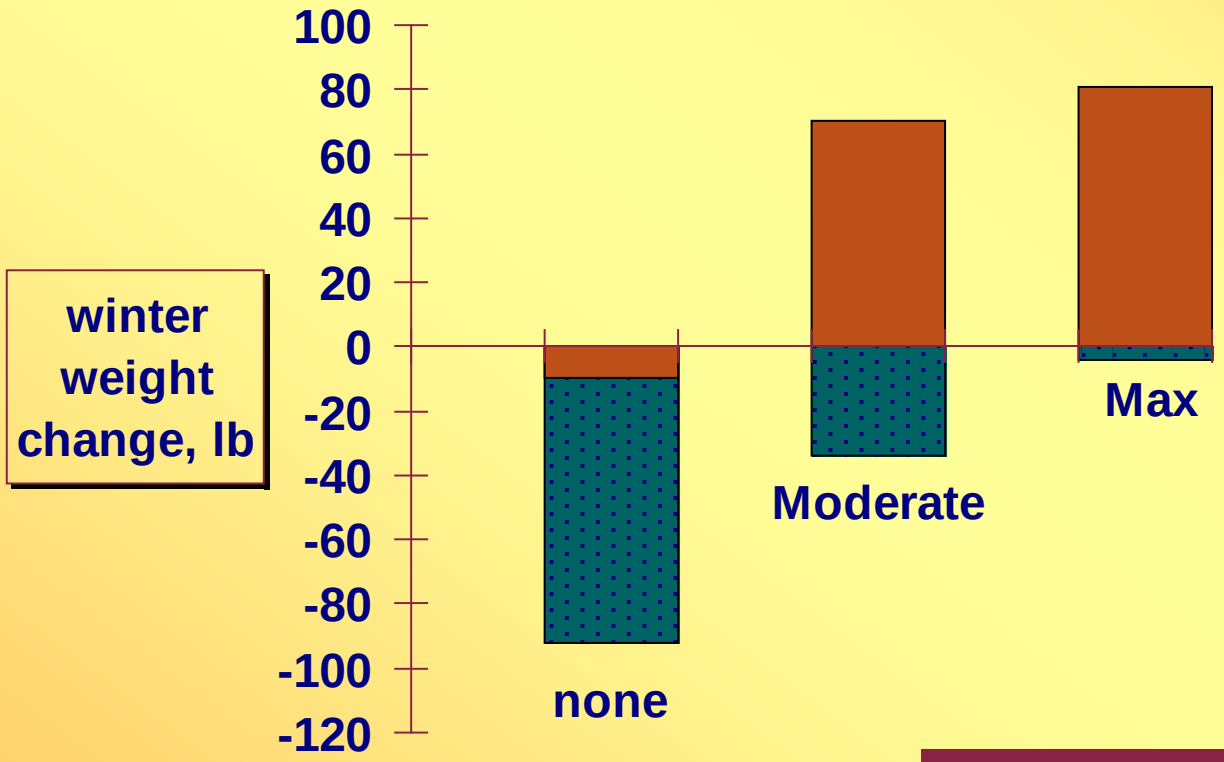
Cost Effective Supplementation in a management year as practiced at CRLRC



Developing strategy – Senior Cows Moderate Protein (SBM 1 lb hd day)



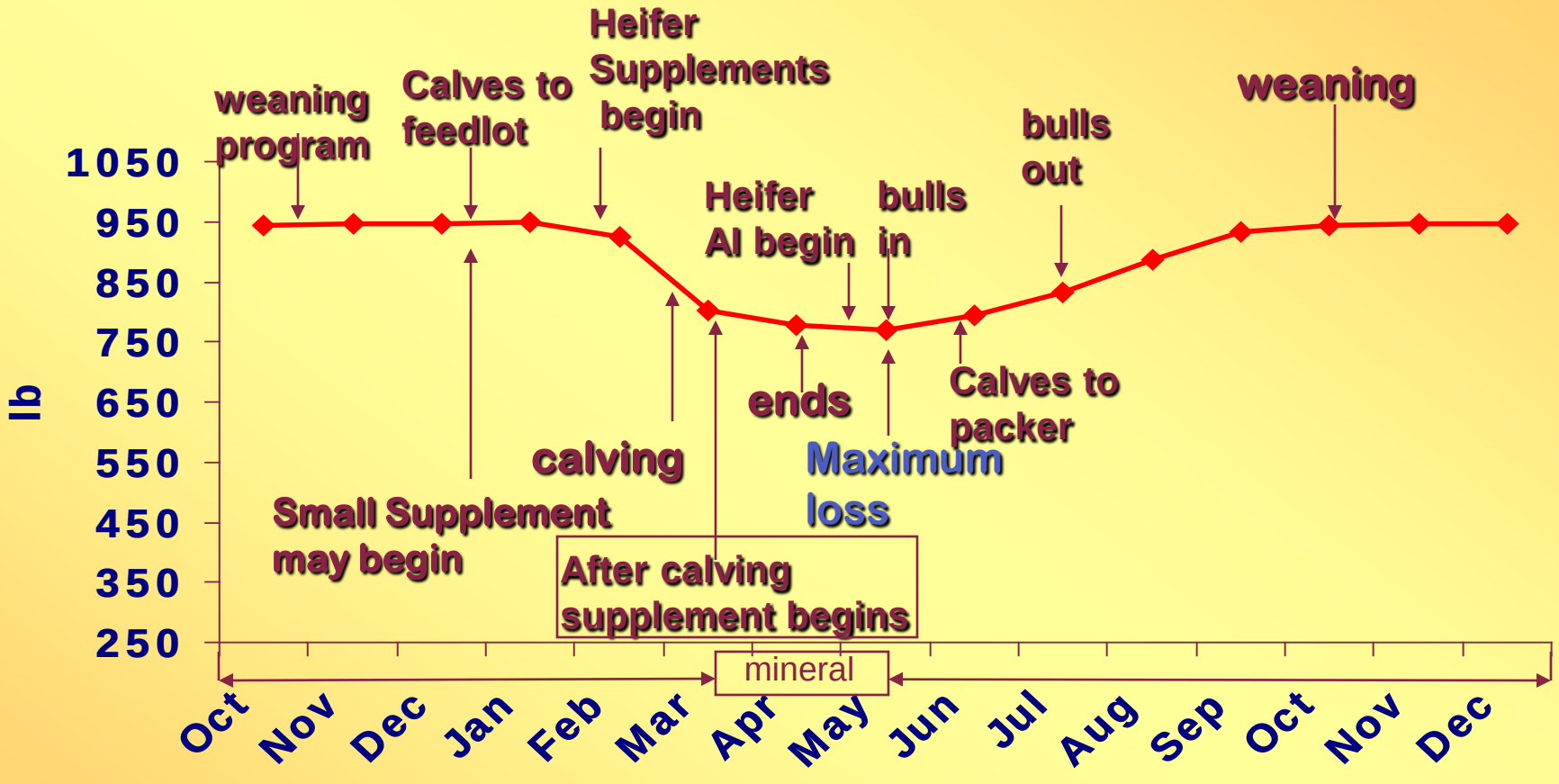
Winter stress-pregnancy: senior cows protein supplementation (1# SBM+1/3 lb blood meal/d)



Effects of bypass protein on utilization of weight loss diets in lambs

	No supp	0.25lb/d bypass
Initial wt lb	98	95
Final wt lb	98	108
ADG (lb/d)	0	0.15
Intake, lb		
wheat straw	1.95	1.70
fish meal	0	0.25
Change in carcass composition		
protein (lb)	-0.31	+1.95
fat (lb)	-3.10	- 2.05

Cost Effective Supplementation in a management year as practiced at CRLRC



Knox et al
http://corona.nmsu.edu

Developing strategy - Protein

- Weight loss occurs energy demands exceed nutrient intake
- Weight loss can be planned
- Weight loss antagonistic to reproduction!
- Manage weight loss to manage RISK

Developing strategy: Protein

- **What does this mean for range supplementation during weight loss?**
  - **Use bypass protein to minimize body protein weight loss**

Developing strategy - Protein

- MAXIMIUM
  - Summary
    - Bypass protein reduces weight loss

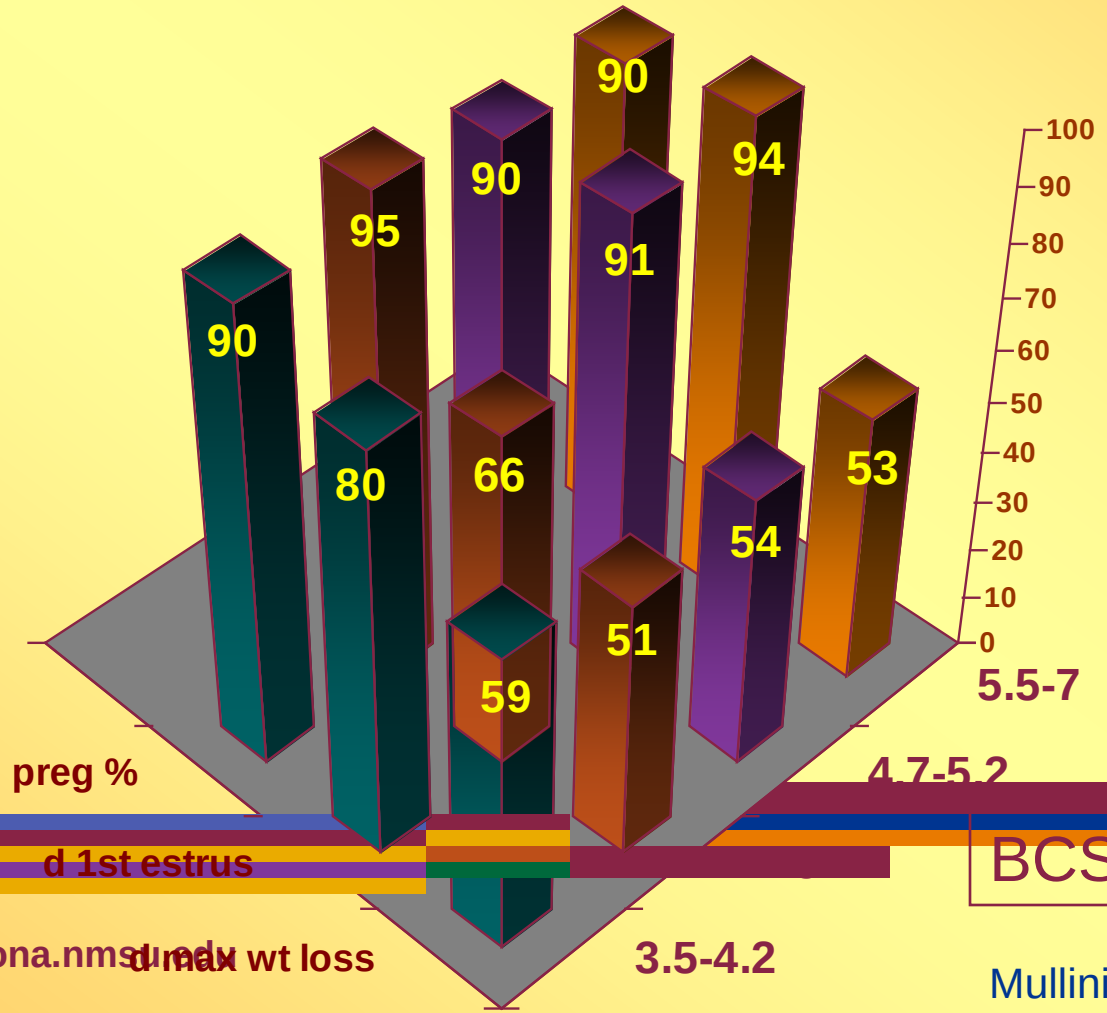
Strategically supplementing young cows after calving

- How do the Moderate and Maximum supplements compare during lactation?

  and

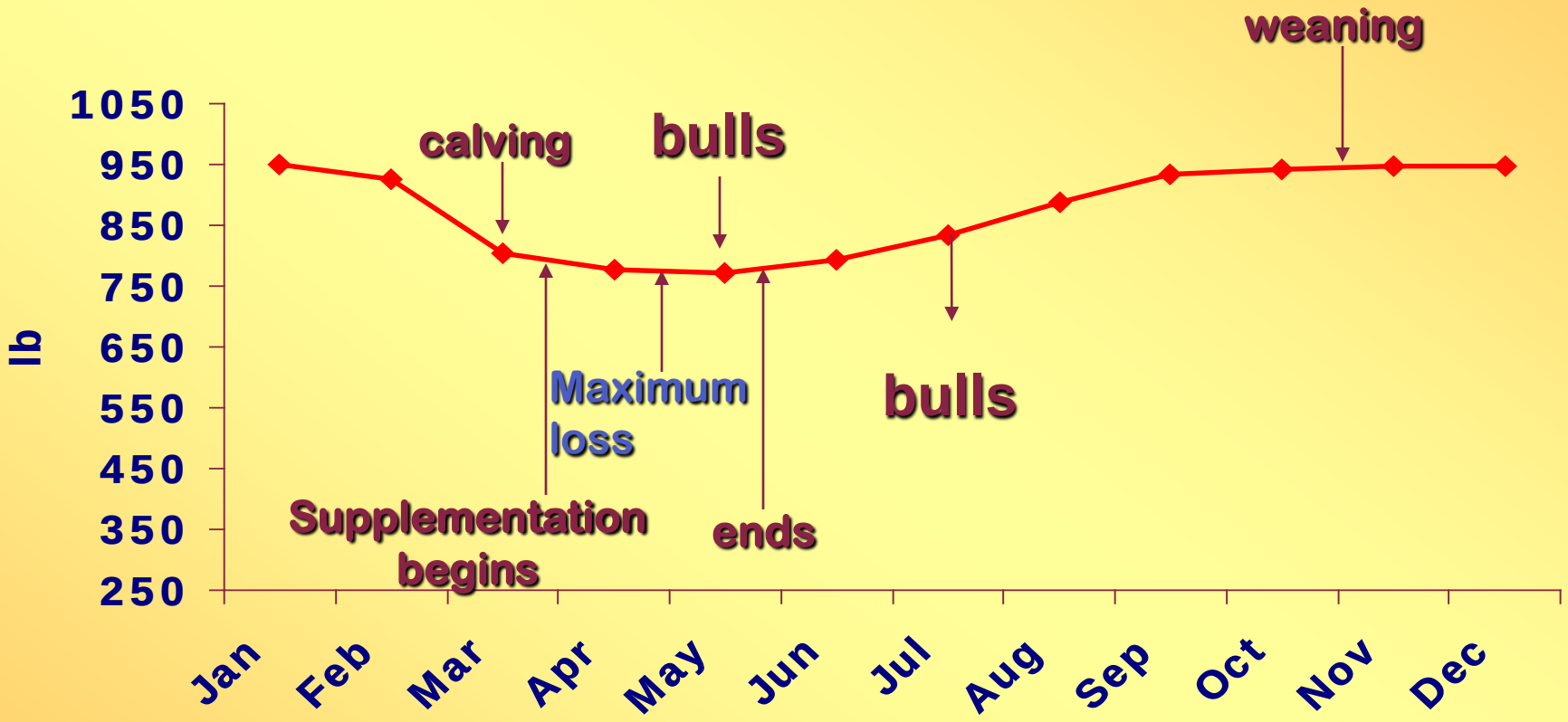
- How important is body condition?

Body Condition at calving on reproduction in 2 & 3 yr olds cow (7 yrs 2001-08)



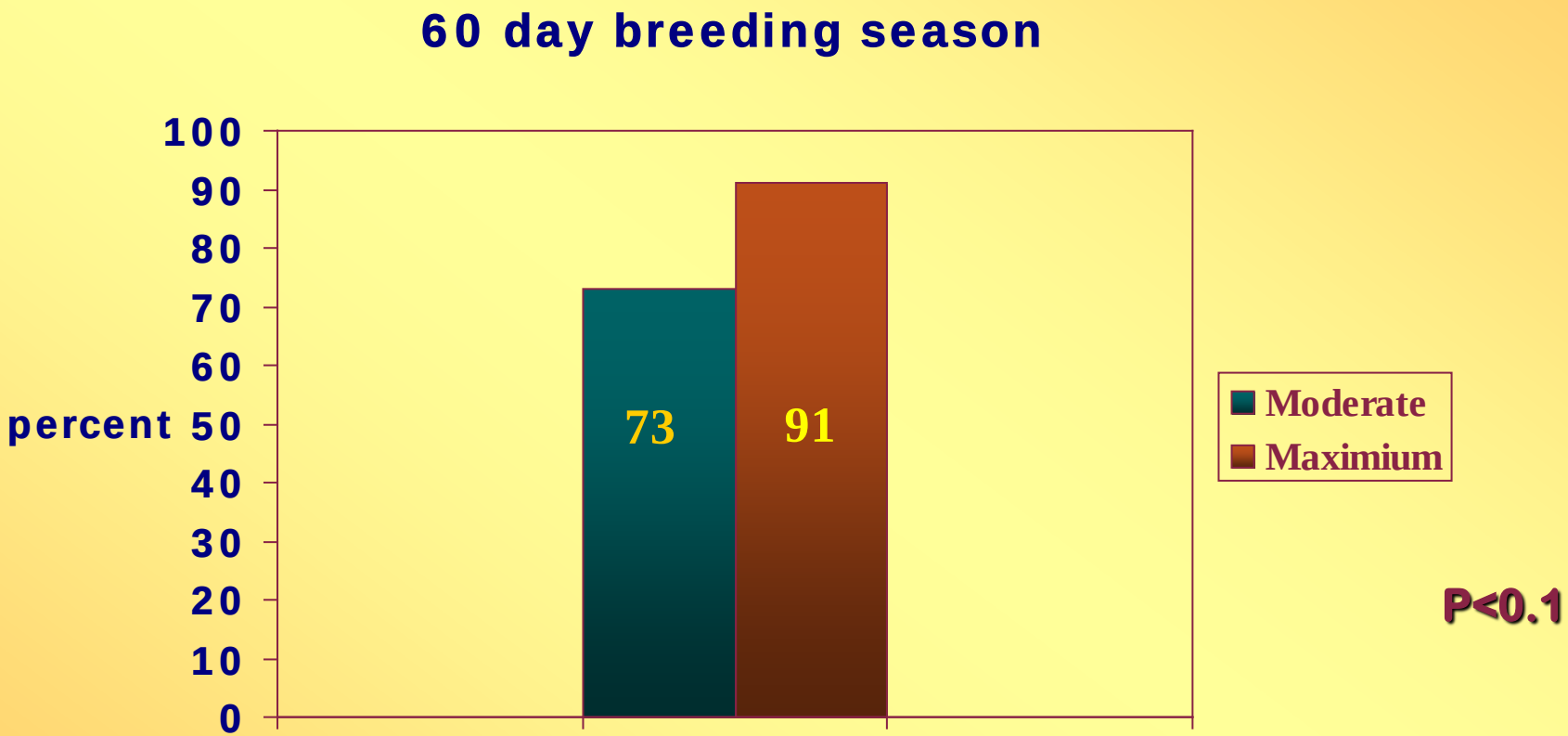
Mulliniks et.al. 2008

After Calving Body Weight Change: MOD vs Max weight loss was similar



Cows fed MAX – higher fall pregnancy

(2# 36% with csm vs 2# 36% with csm+fm+bm)

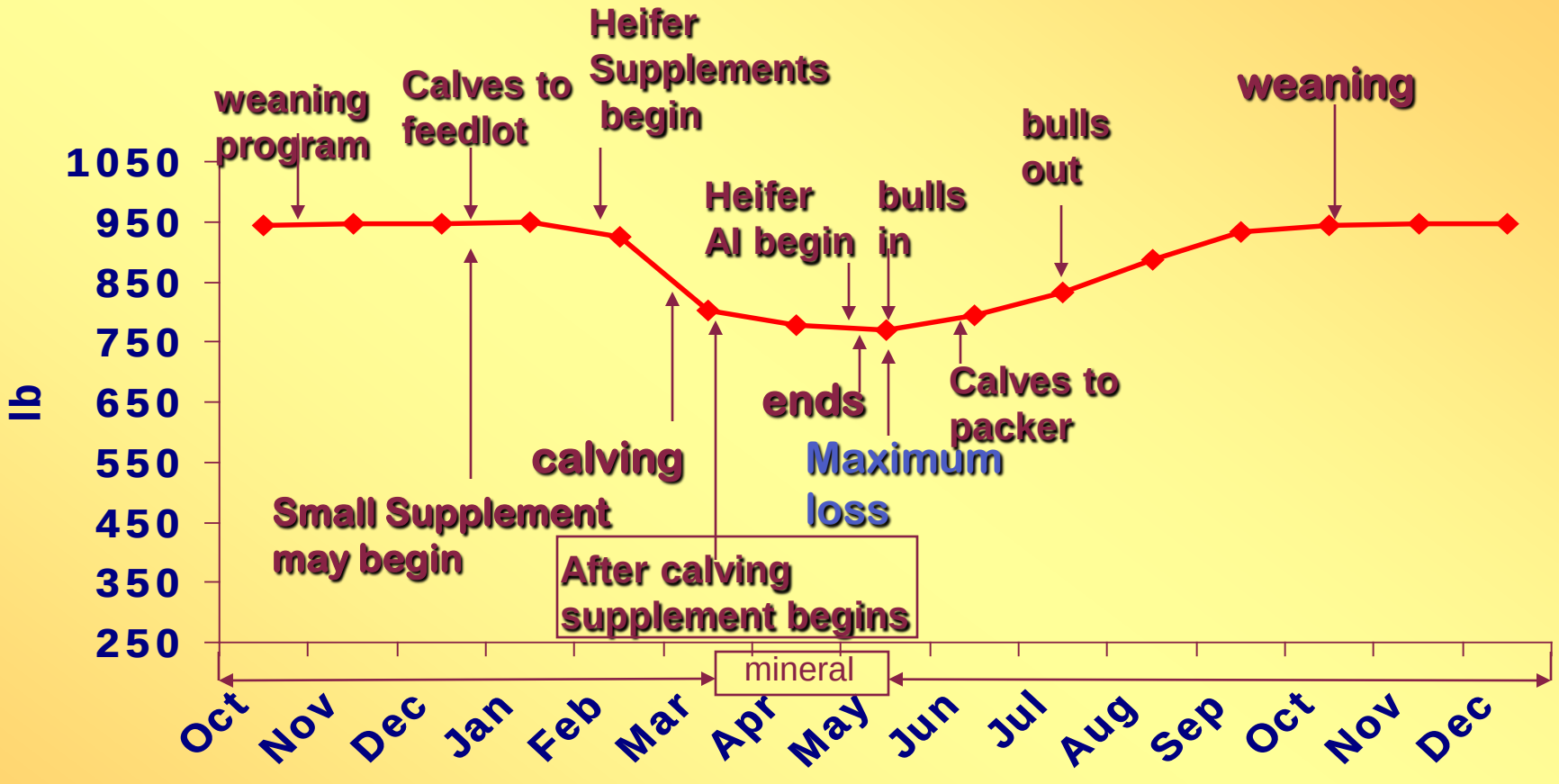


Knox et al

Developing strategy – Protein + glucose

- Super MAX (protein same as MAX)
  - **36% crude protein (CP) supplement**
    - **50% rumen degradable**
    - **6% CP equivalents from urea**
    - ❖**40 to 100 g/d propionate salt**
  - Hand fed, (cubes) target 900 g per day
    - Fed every other day, 3X or 2X per week
  - Effective during body weight loss (lactation or environmental stress)

Cost Effective Supplementation in a management year as practiced at CRLRC



Knox et al
http://corona.nmsu.edu

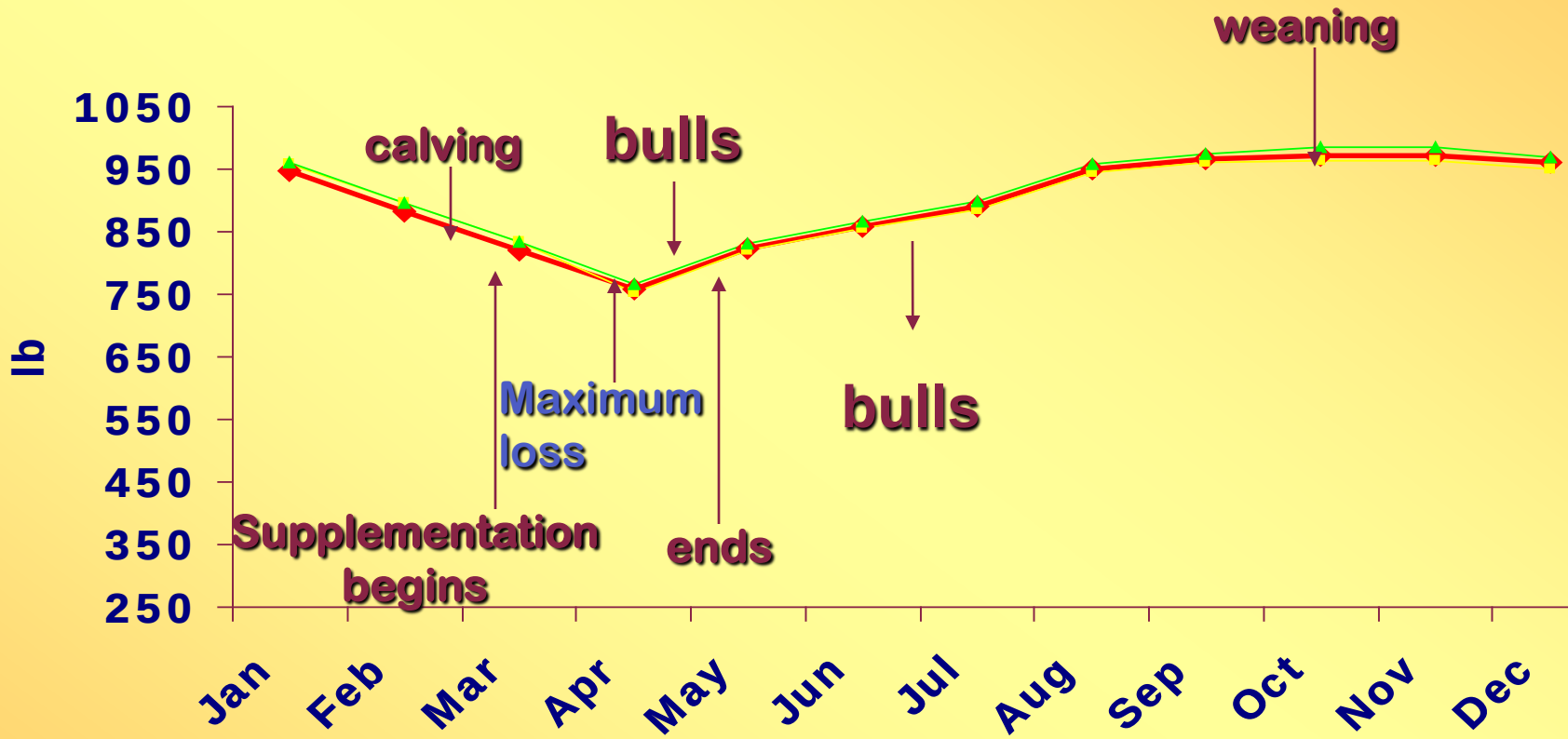
Developing strategy - Protein

- **What does this mean for range supplements after calving:**
  - Ruminal degradable to improve ruminal microbial activity
  - Ruminal undegradable protein to minimize weight loss
  - **Propionate salt to improve glucose availability and energy metabolism**

Days to first estrus: less with greater glucose potential

Linear P<.01

After Calving Body Weight Change: MOD vs Max weight loss was similar



Knox et al

Pregnancy rate, return to estrus, milk production, and calf weaning weight of for young cows fed three different postpartum supplements (2000 to 2007)

	Supplement		
Item	Moderate	Maximum	SupMax
Pregnancy rate, %	84	88	95
Return to estrus, days	90	89	84
Milk production, lbs/d	13.4	15.1	13.8

Southwest Grazing Land Innovations CORONA Range and Livestock Research Center

http://corona.nmsu.edu

Mulliniks unpublished

NM STATE

Economic comparison of three postpartum supplements fed to 100, 2 & 3 yr old cows.

YEAR 1

Item	Moderate	Maximum	SupMax
Supplement cost/ton	318	385	474
Feed cost/cow	22.26	26.95	33.18
Calf weaning wt, lb	460	480	473
Value calves	$570	$595	$586
Value minus feed	546	569	553
difference		21	6

Economic comparison of three postpartum supplements fed to 100, 2 & 3 yr old cows.

Item	Moderate	Maximum	SupMax
YEAR 1			
Pregnancy, %	85	88	95
YEAR 2			
Calf loss/exposed cow,%	2.8	2.8	2.8
Calf crop/exposed cow, %	82.6	85.2	92.3

Economic comparison of three postpartum supplements fed to 100, 2 & 3 yr old cows.

YEAR 2

Item	Moderate	Maximum	SupMax
No. of cows	82	85	92
Adjusted calf weaning wt, lb	459	482	485
Value calves	$570	$597	$601
Total revenue,$	44845	48512	52276
difference	---	3666	7430