

# Approaches to Minimize Protein Supplementation

SOUTHWEST Beef Symposium  
Midland , Texas  
January 13 to 14, 2009

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# Outline

- **Definitions**
- **Assumptions**
- **Supplement toolbox**
- **Implementation at Corona Range and Livestock Research Center**



# What is our nutritional management strategy?

- **THE PRIMARY ENERGY SOURCE**
  - **RANCH FORAGE**
- **Ranch was purchased based on forage production (ENERGY)**

# What is our nutritional management strategy?

- **2<sup>nd</sup> ENERGY SOURCE**
  - Cow body fat
  - Planned weight loss
  - Utilize body reserves to supplement energy
  - Lose wt without hurting cow





# What is our nutritional management strategy?

- **Assumption: Energy should not require supplementation**
- **Depend on range forage and conservative forage management**
- **Depend on weight loss to meet cows energy deficiency**

# What is our nutritional management strategy?

## Cow can easily eat all she wants every day



# What is our nutritional management strategy?

- **3 tools with little associated costs**
  - Use fresh pasture at critical nutritional periods (increase protein with selectivity)
  - At weaning sort bottom 10 to 15% into “hospital group”
  - Feed supplement mid-day

# What is our supplement management strategy?

- **In New Mexico limiting nutrients include;**
  - phosphorus
  - potassium,
  - magnesium,
  - sodium,
  - selenium
  - zinc (Mathis and Sawyer)
  - Vitamin A & Protein (Knox 1966, Wallace 1991)
    - As of this fall (10/08) we dropped our phosphorus from 8% to 4% (reduced cost over \$200 a ton)



# Approaches to minimize strategic protein supplementation

- **Low labor (minimize delivery costs)**
- **Biologically potent formulation**
- **Efficient response to supplemental nutrients**
- **Improves unit cost of production (UCOP)**

# Approaches to minimize strategic protein supplementation

- **Goals for 2009:**
  - **80% calving in 30 days**
  - **Budget \$50 per cow per year purchased feed**
  - **Have positive cash flow (all segments of beef cycle)**
  - **Low UCOP**

# Goal = Nutritional Management

- **Improve livestock efficiency and profitability with no increased costs!**



# Developing strategy: Mineral

- **Fundamentals of Strategic Cost Effective Supplementation is;**
  - 1. Adequate forage**
  - 2. Mineral nutrition - adequate**  
**Identify limiting major and trace minerals (diet & water)**



# Developing strategy: Protein

- **Diet – brown/dormant less than 7% CP**
- **Expected responses to protein supplement**
  - **Increase digestibility**
  - **Increase intake**
  - **When should we supplement?**

# Developing strategy: Protein

- **Use supplement when it will critically change animal performance (strategic)**
- **Key performance criteria :**
  - **Calf wt weaned per cow exposed**
  - **Days to first estrus**
  - **Pregnancy rate**

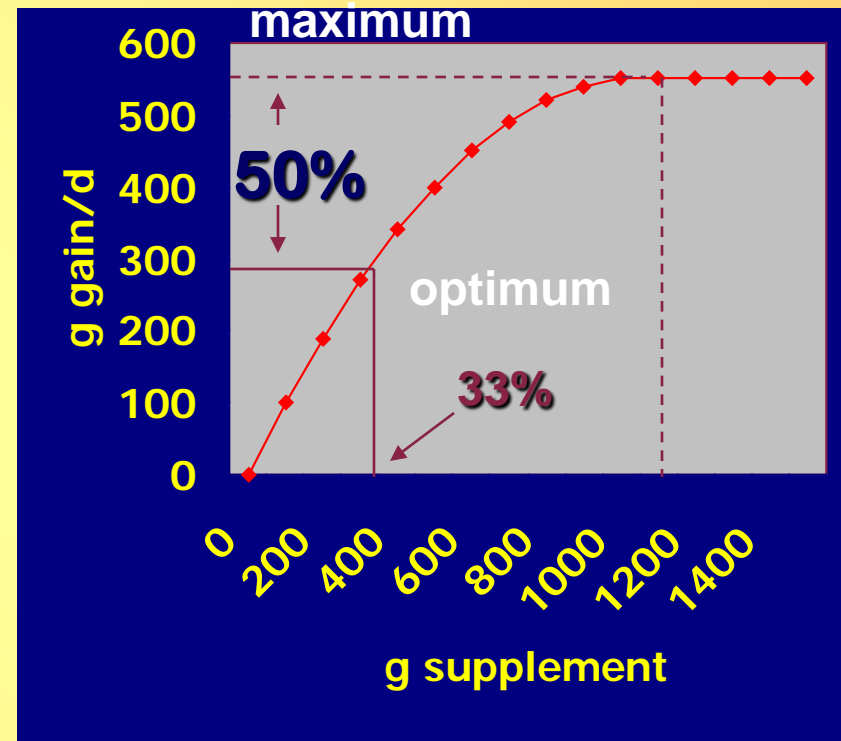
# Developing strategy: Protein

- **Continually assess:**
  - **Cow body condition**
  - **Forage conditions**

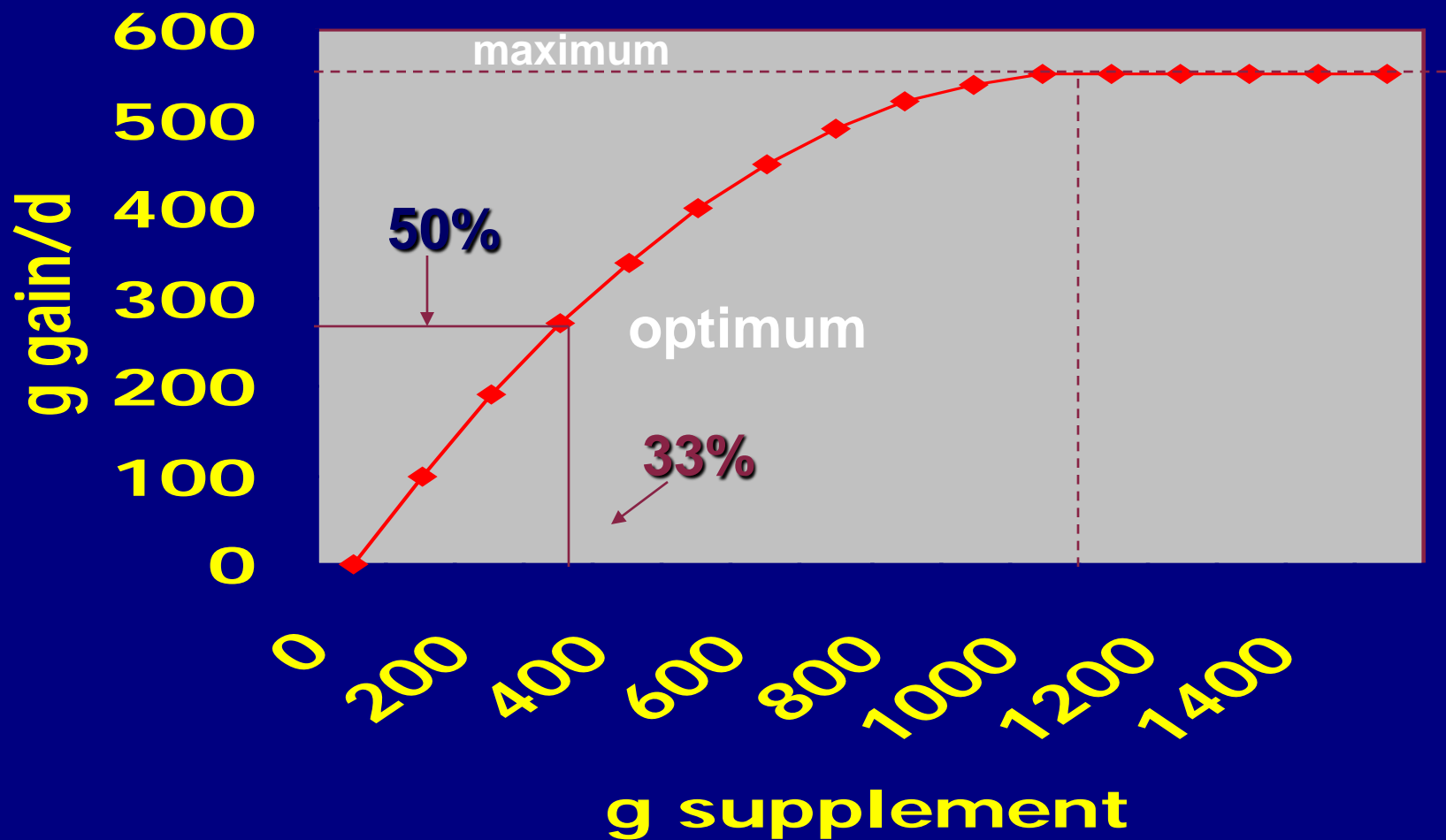


# Developing strategy: Protein

- Base concept
- Diminishing returns (economic)
- Dose/response (nutritional requirements)
  - 50% response from 33% feed



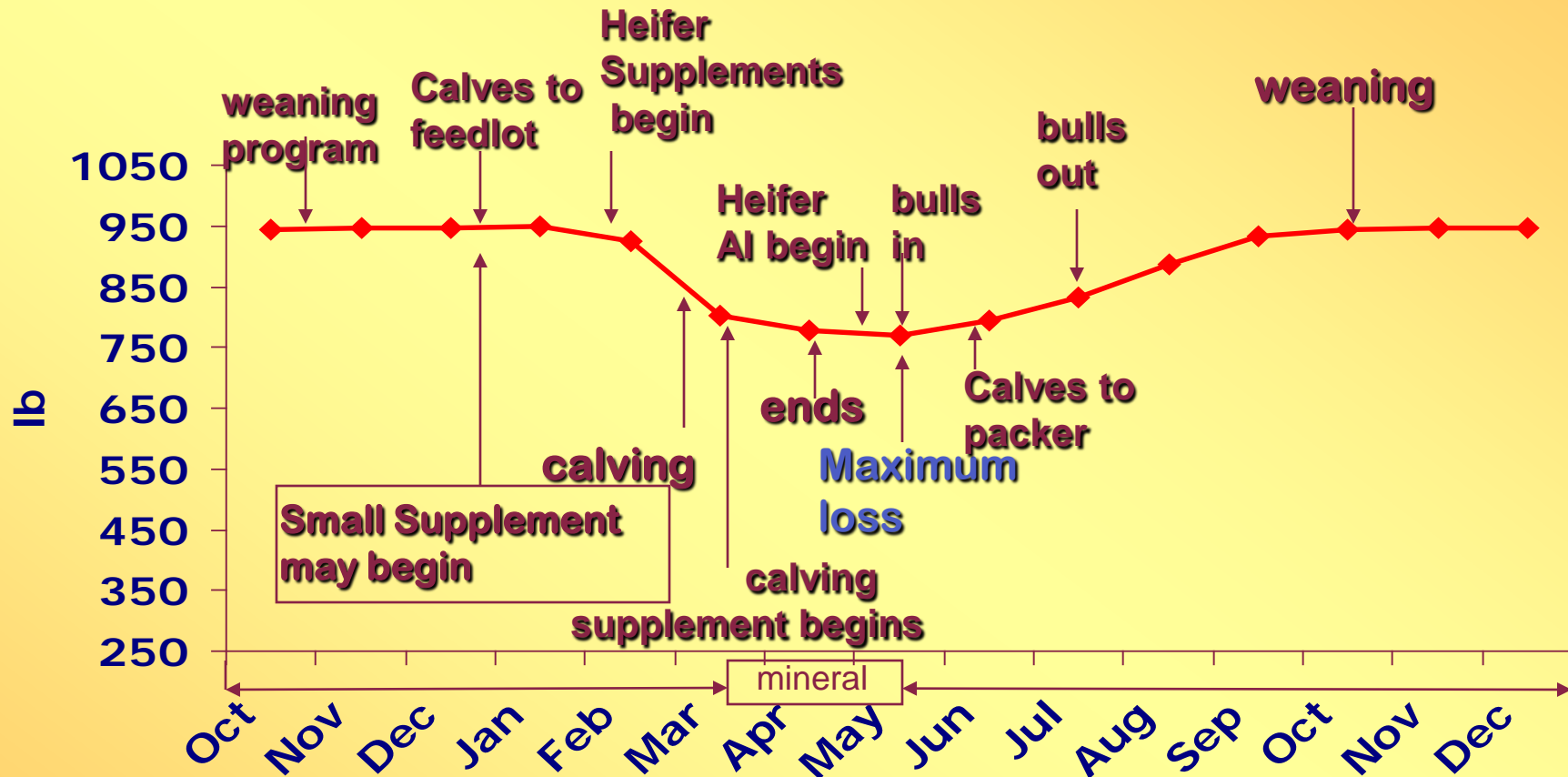




# Developing strategy - Protein

- **HOW MUCH PROTEIN TO FEED?**
- **5 quantities Strategic: minimal protein supplementation schemes**
  1. Minute – 4 oz/d (self fed)
  2. Minimum – ½ lb/d (fed 1 time/wk at 3.5 lb/ hd)
  3. Moderate – 1 lb/d (fed 2 to 3 times/wk)\*
  4. Maximum – 2 lb/d (fed 2 to 3 times/wk)
  5. Super Maximum – Max + propionate salt

# Cost Effective Supplementation in a management year as practiced at CRLRC



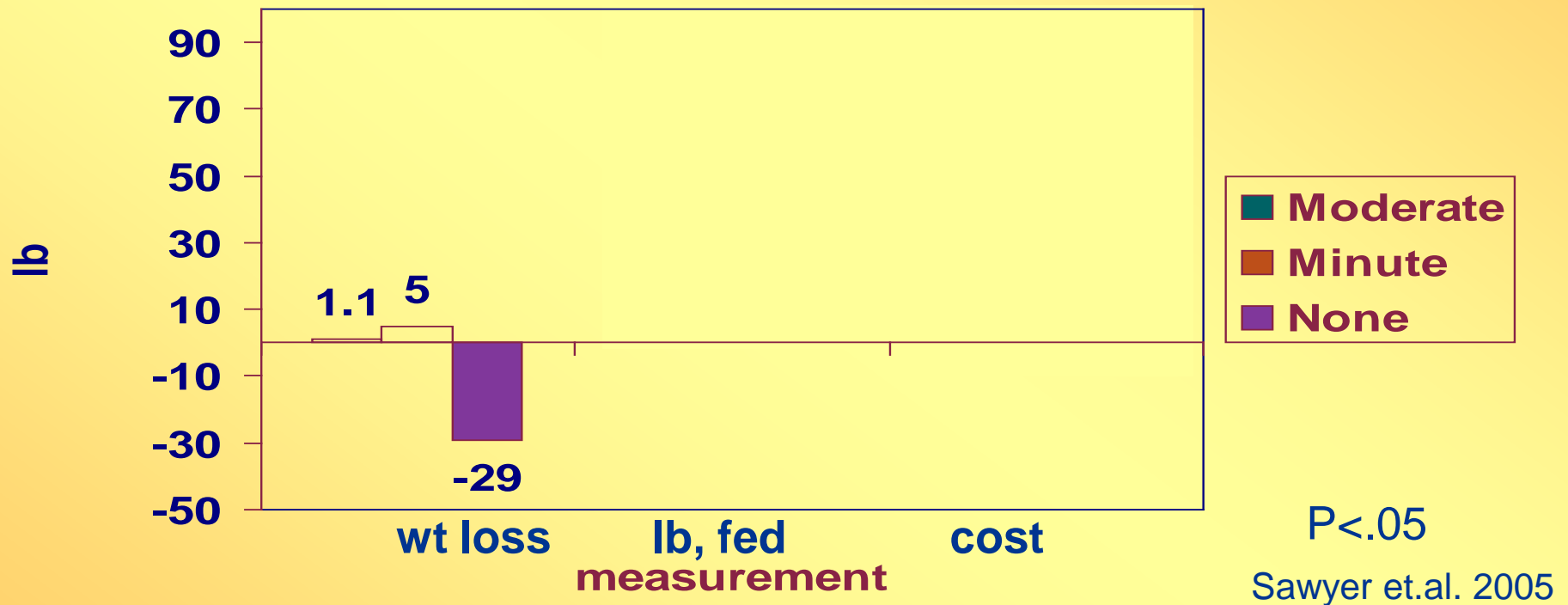
# Developing strategy: Protein

- MINUTE (NMSU Small supplement)
  - 50% Corona Ranch Mineral
  - 50% high bypass protein (mixed 50:50)
    - Feather, blood or fish meals
    - Not corn gluten meal
  - Self fed, target 4 oz per day
    - Maximum allowable intake 9 oz
  - Low labor, low nutritional stress
  - Very efficient **costs \$0.04 /d**



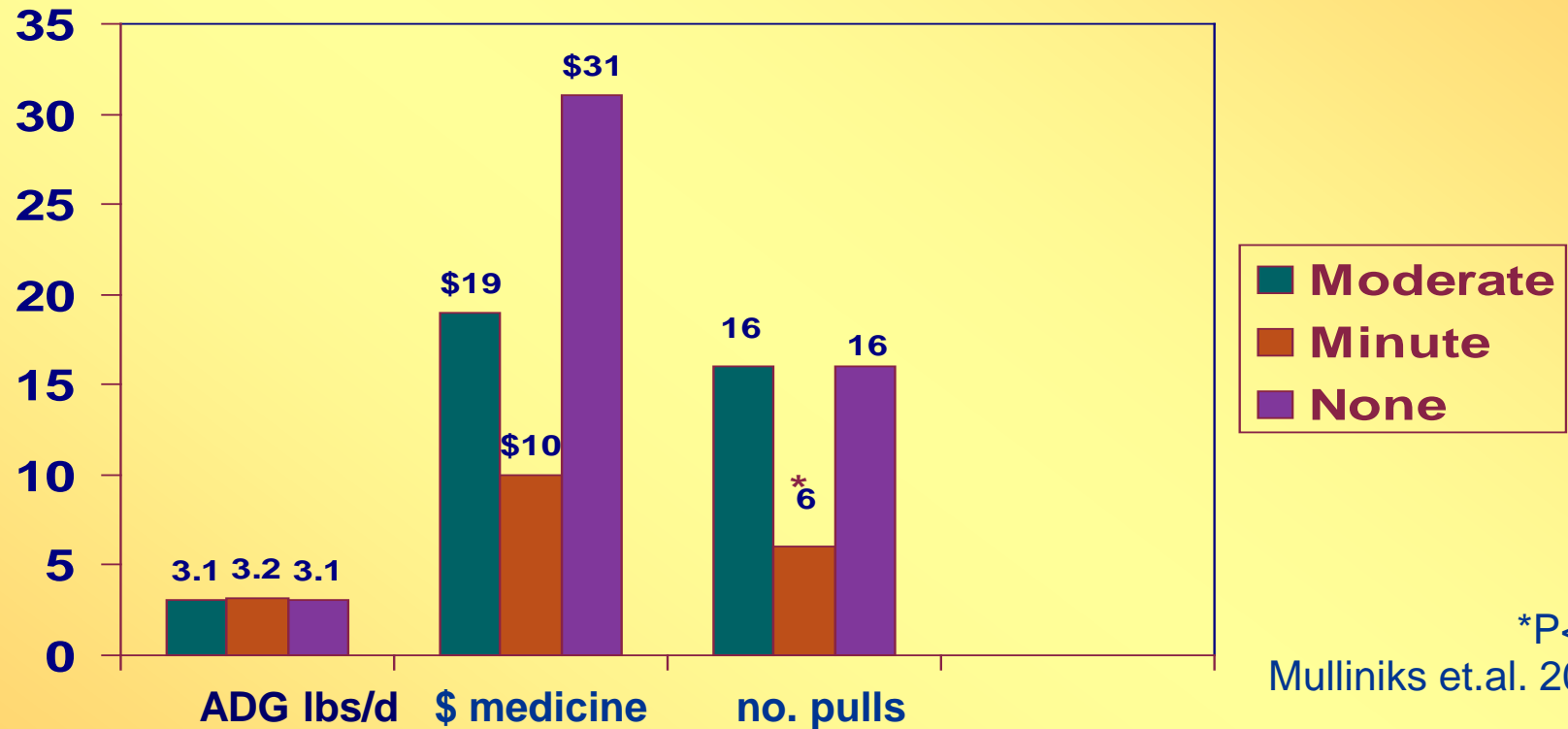
# Consumption, weight loss & cost in range cows fed Minute Supplement

## Results (2002, 3 and 4)



# Calf feedlot gain, pull rate & net profit from range cows fed Minute Supplement

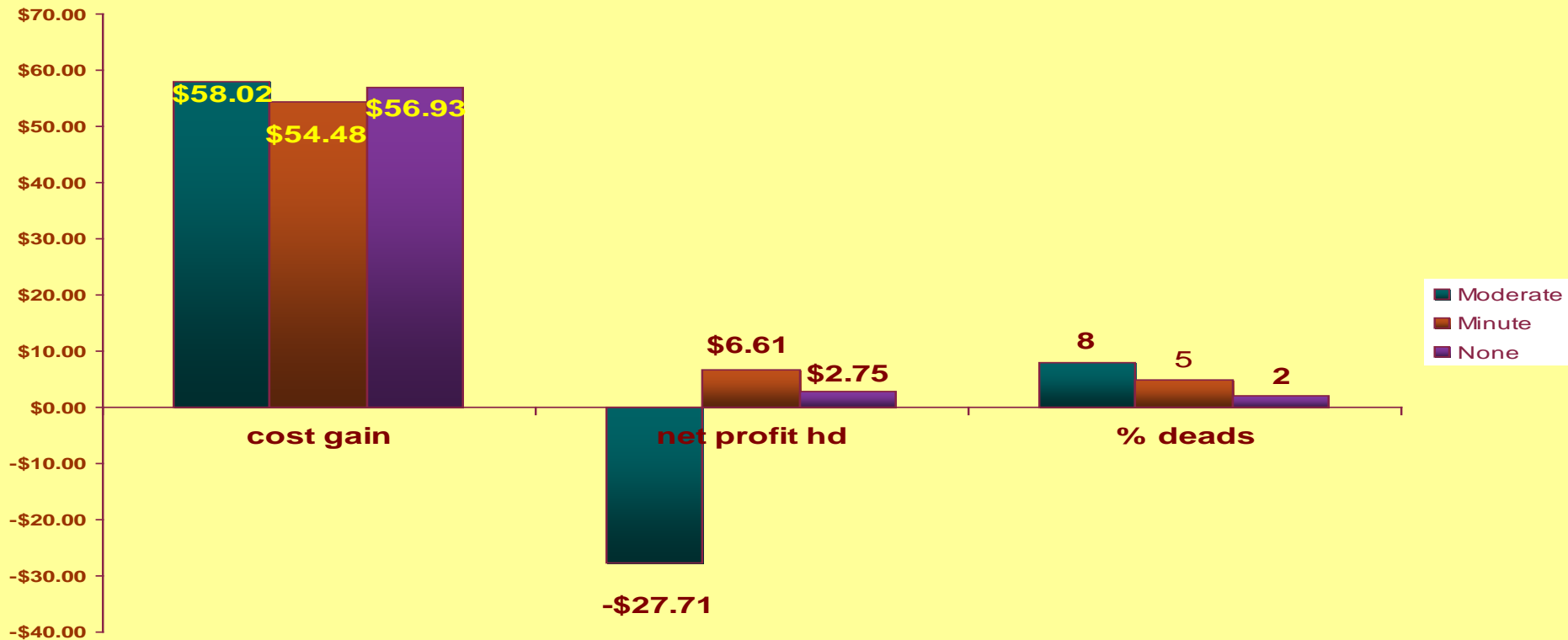
## Results (2002, 3, 4 & 5)



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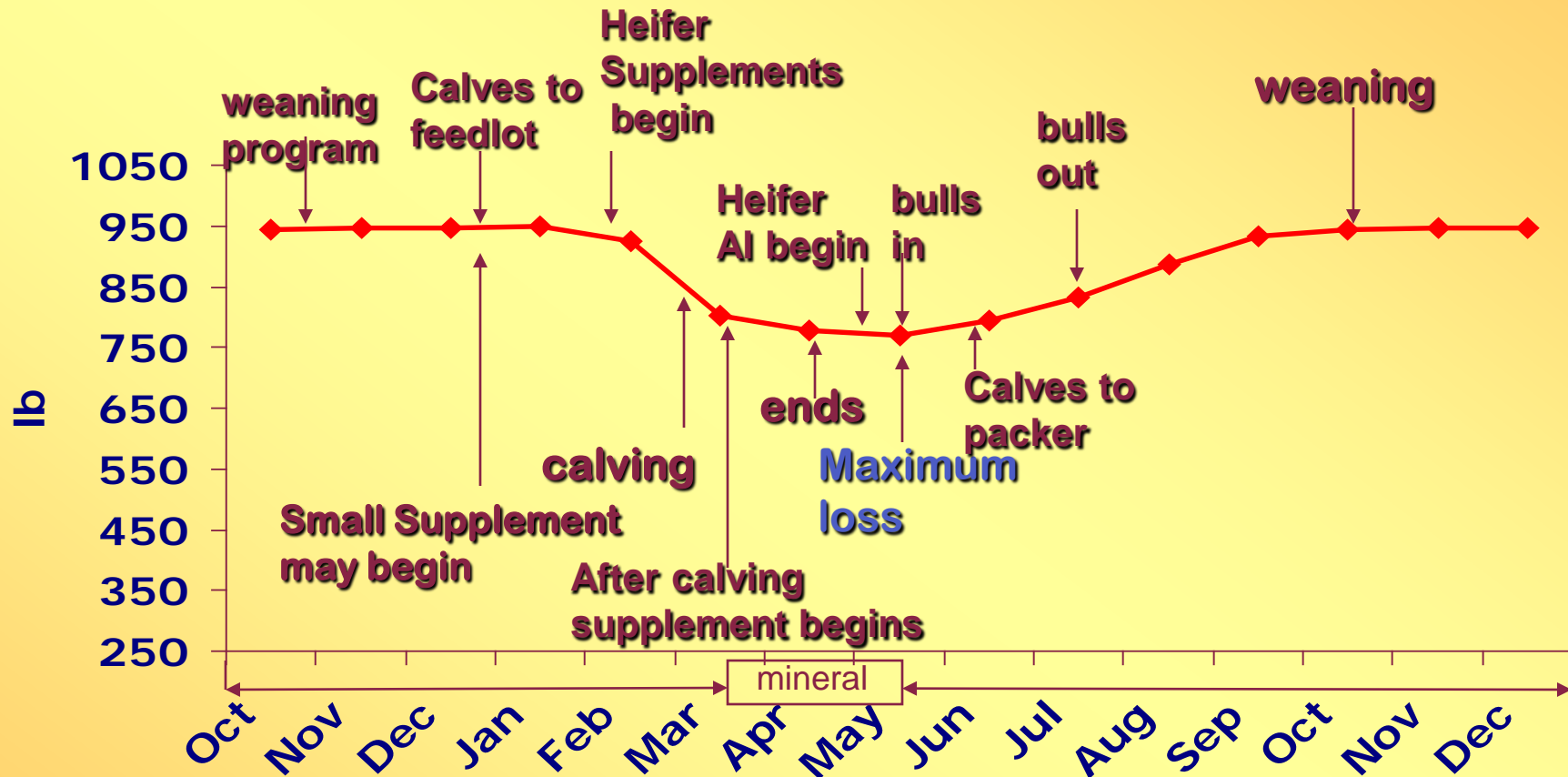
Mulliniks et.al. 2008

# Cost/cwt gain, net profit/head,% deads from range cows fed Minute Supplement



Mulliniks et.al. 2008

# Cost Effective Supplementation in a management year as practiced at CRLRC





# Developing strategy: Protein

- Minimum
  - 36% crude protein (CP) supplement
    - 65% rumen degradable
    - Oil seed meal base
    - 6% CP equivalents from urea
  - Hand fed, (cubes) target 0.5 lb per day
    - 3.5 lbs/hd 1X per week
  - Lower labor, low nutritional stress
  - Efficient, costs \$0.08/d

# Responses to minimum supplement by heifers

- In 2004 and 2005 Replacement heifers (7 to 10 month old)
- Fed Mini supplement
  - November to February
- Gained from
  - 0.1 to .5 lb per day



# Developing strategy: Protein

- MODERATE (typical high protein)
  - 36% crude protein (CP) supplement
    - 65% rumen degradable
    - Oil seed meal base
    - 6% CP equivalents from urea
  - Hand fed, (cubes or cake) target 1.0 to 2.0 lbs/d, costs \$0.16 to 0.30 /d
    - Fed every other day, 3X or 2X per week

# Developing strategy - Protein

- MODERATE
  - Effective during;
    - pregnancy
    - stressful climatic conditions
  - Most often used

