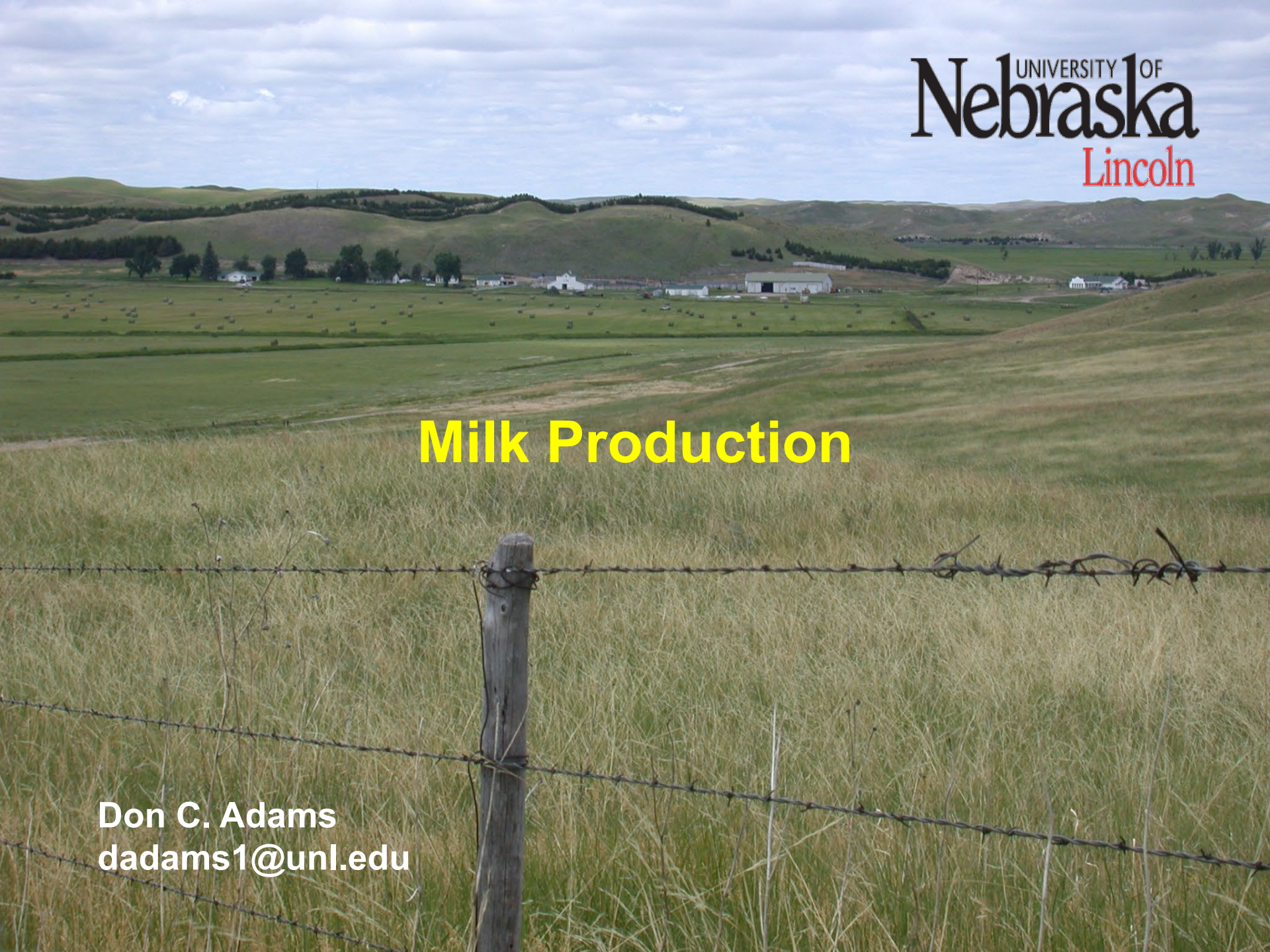
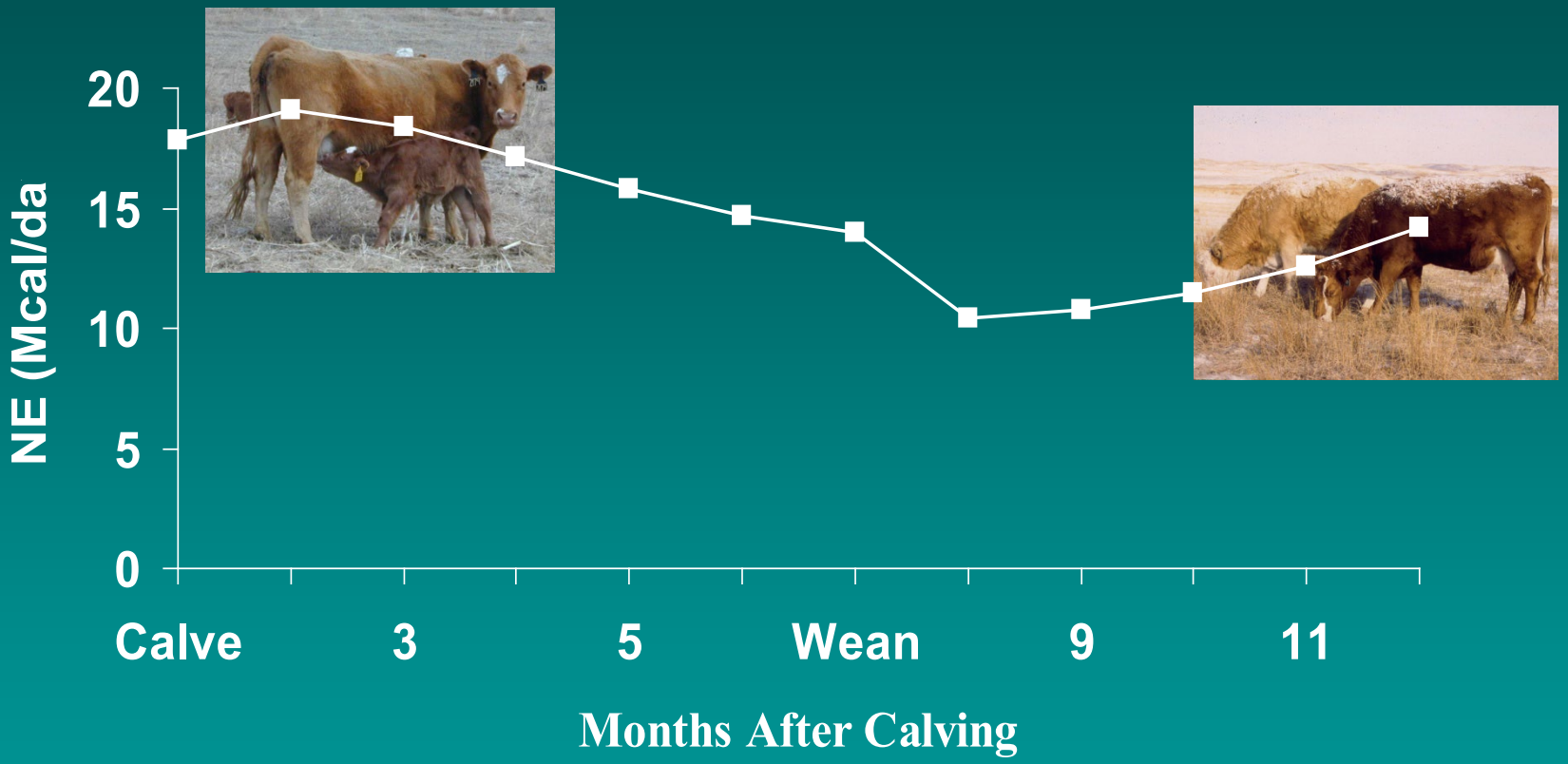


Milk Production

Don C. Adams
dadams1@unl.edu

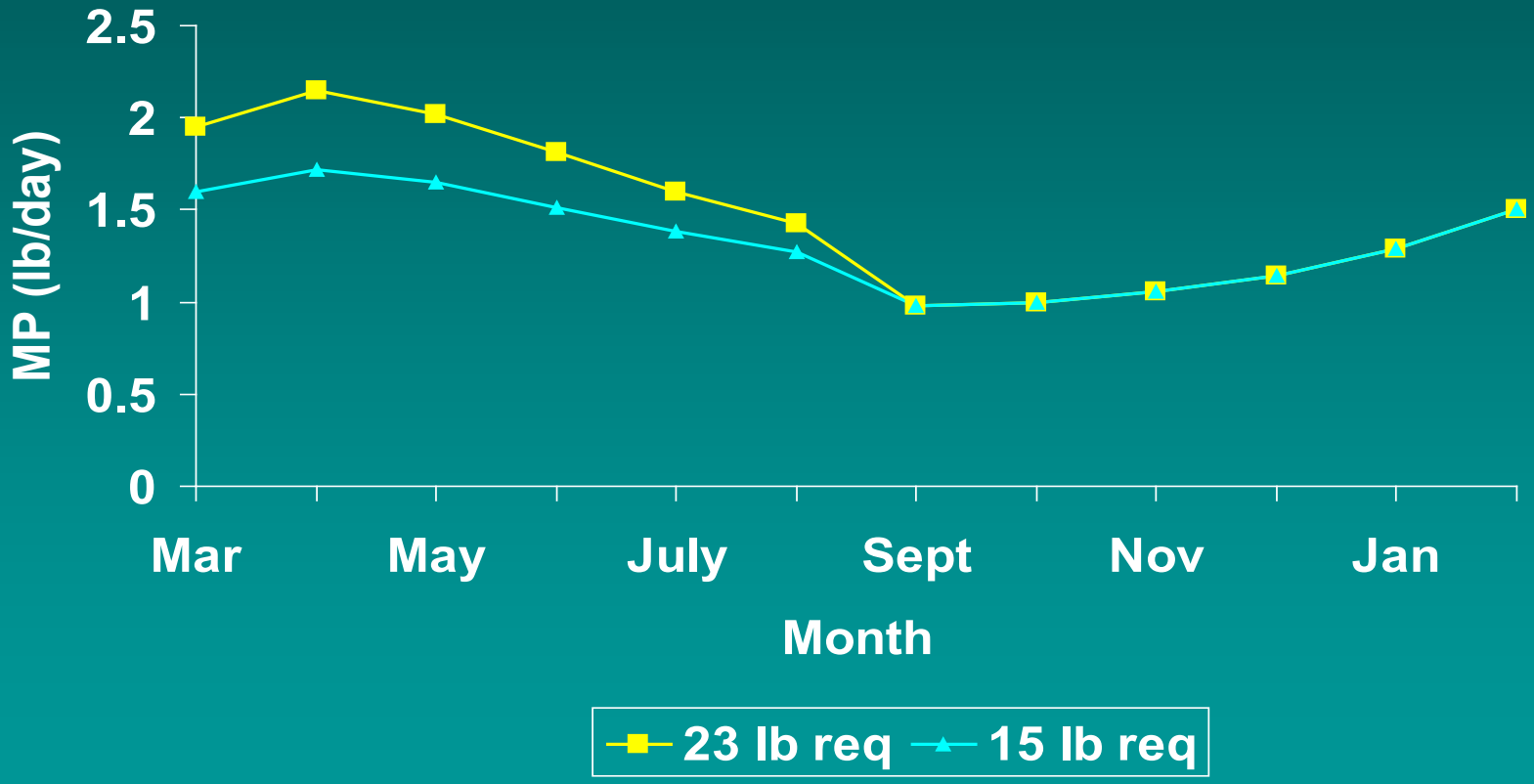
Nutrient requirements of the cow

Net Energy (NE) Requirements for a 1200 lb March Calving Cow with 23 lbs/day Peak Milk Production



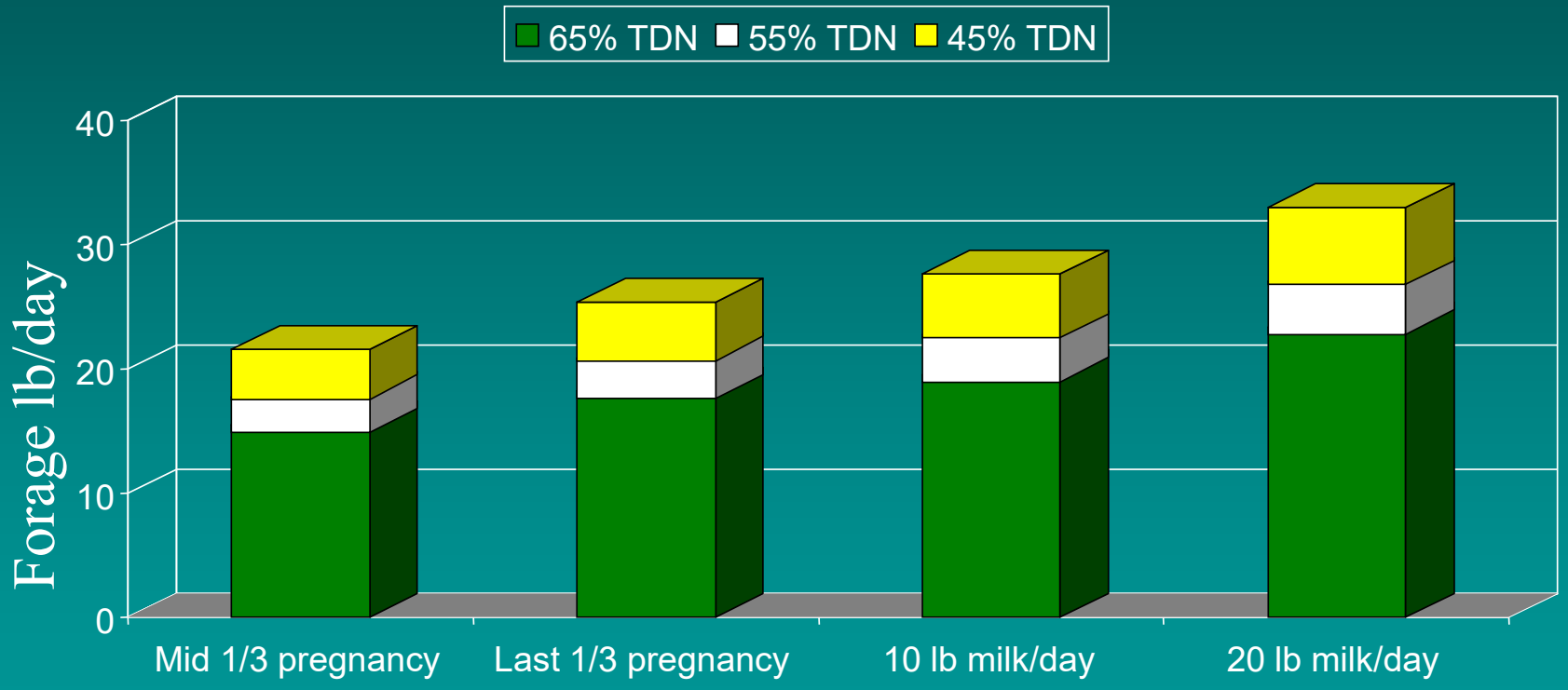
NRC (1996)

Metabolizable Protein (MP) requirement for a 1200 lb March calving cow with peak milk production of either 15 or 23 lbs/day



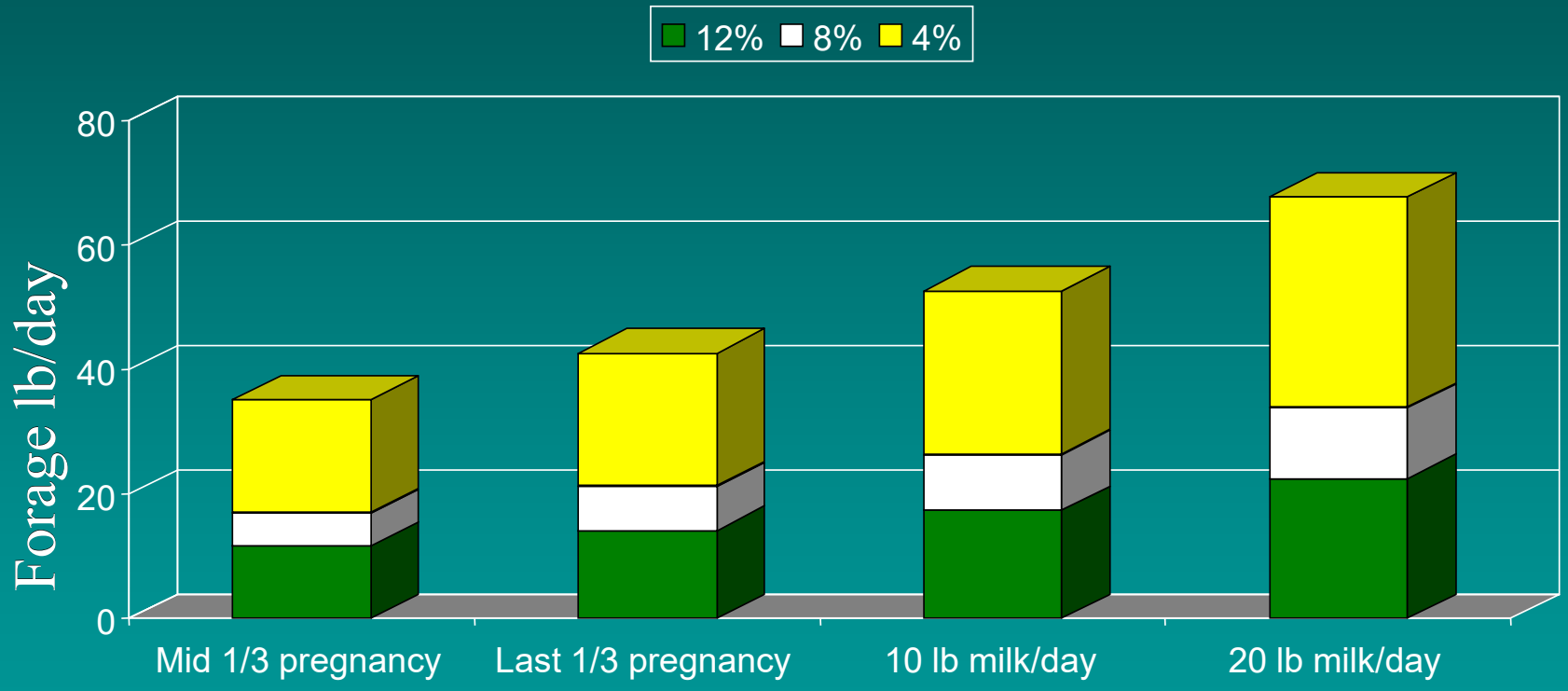
NRC (1996)

FORAGE INTAKE NEEDED TO PROVIDE ENERGY REQUIRED FOR PREGNANCY AND MILK (1200 POUND COW)



Physiological Status of the Cow

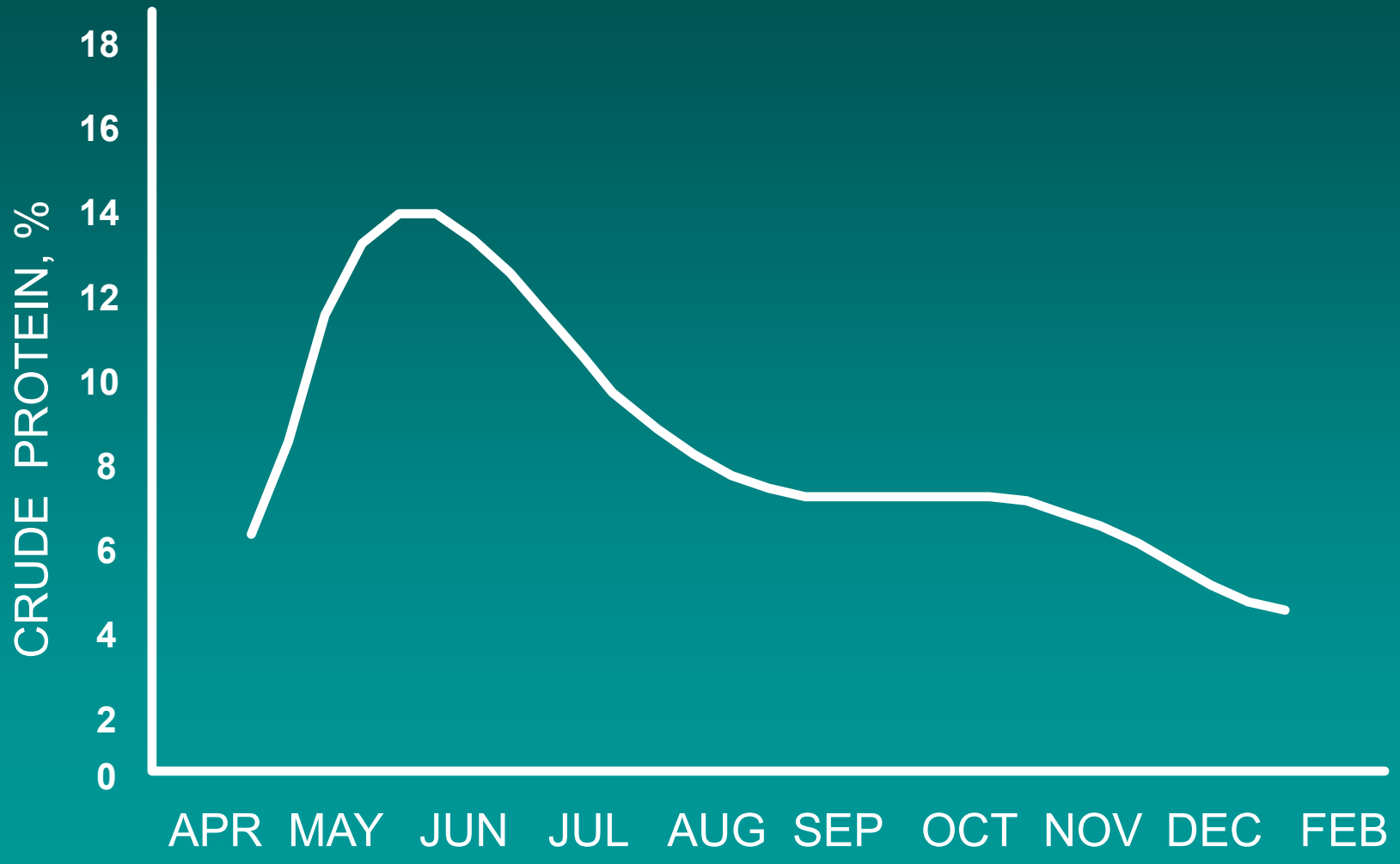
FORAGE INTAKE NEEDED TO PROVIDE PROTEIN REQUIRED FOR PREGNANCY AND MILK (1200 POUND COW)



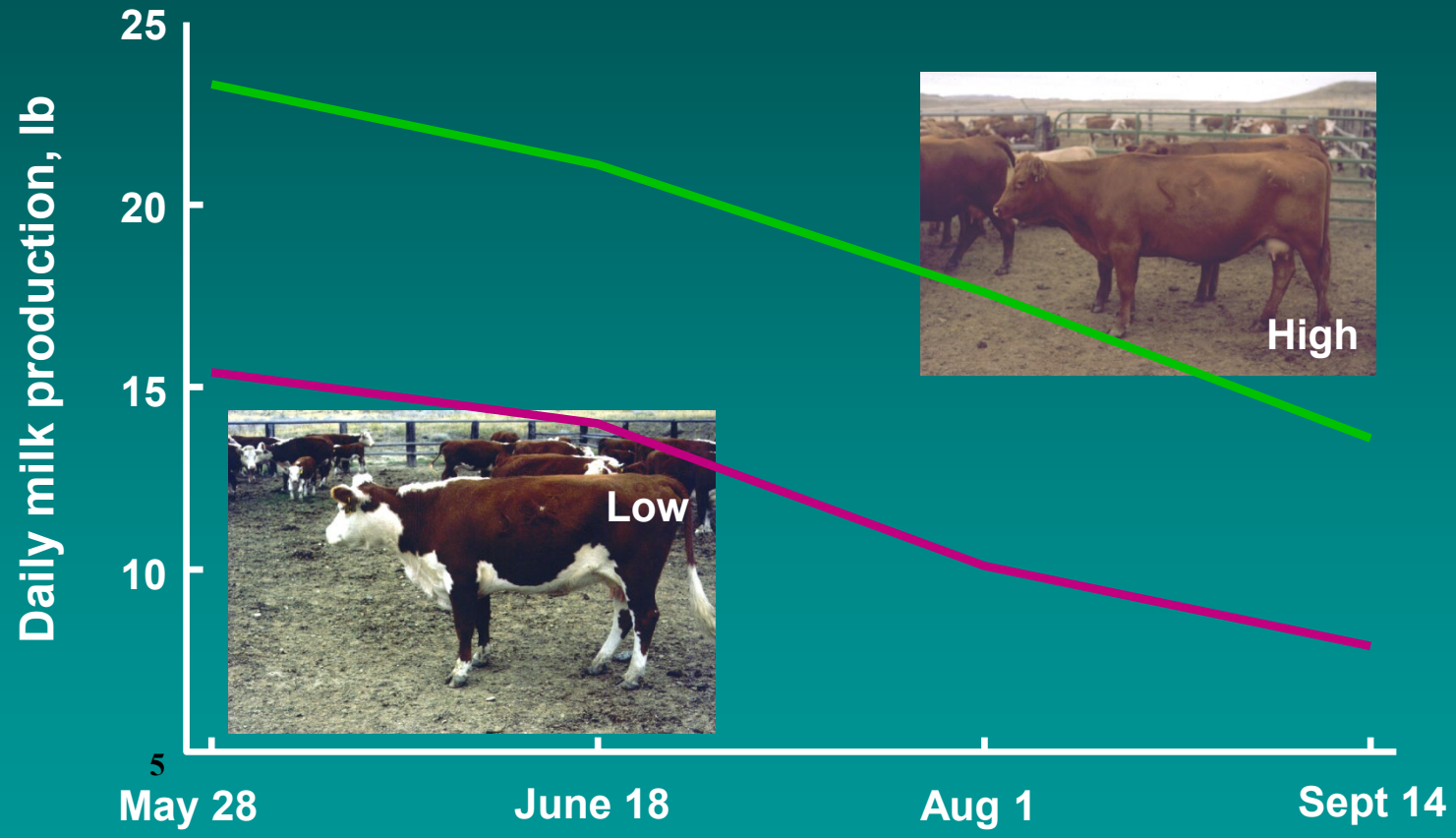
Physiological Status of the Cow

Amount of Milk Produced by the Cow

Crude protein in cattle diets on Northern Great Plains rangeland

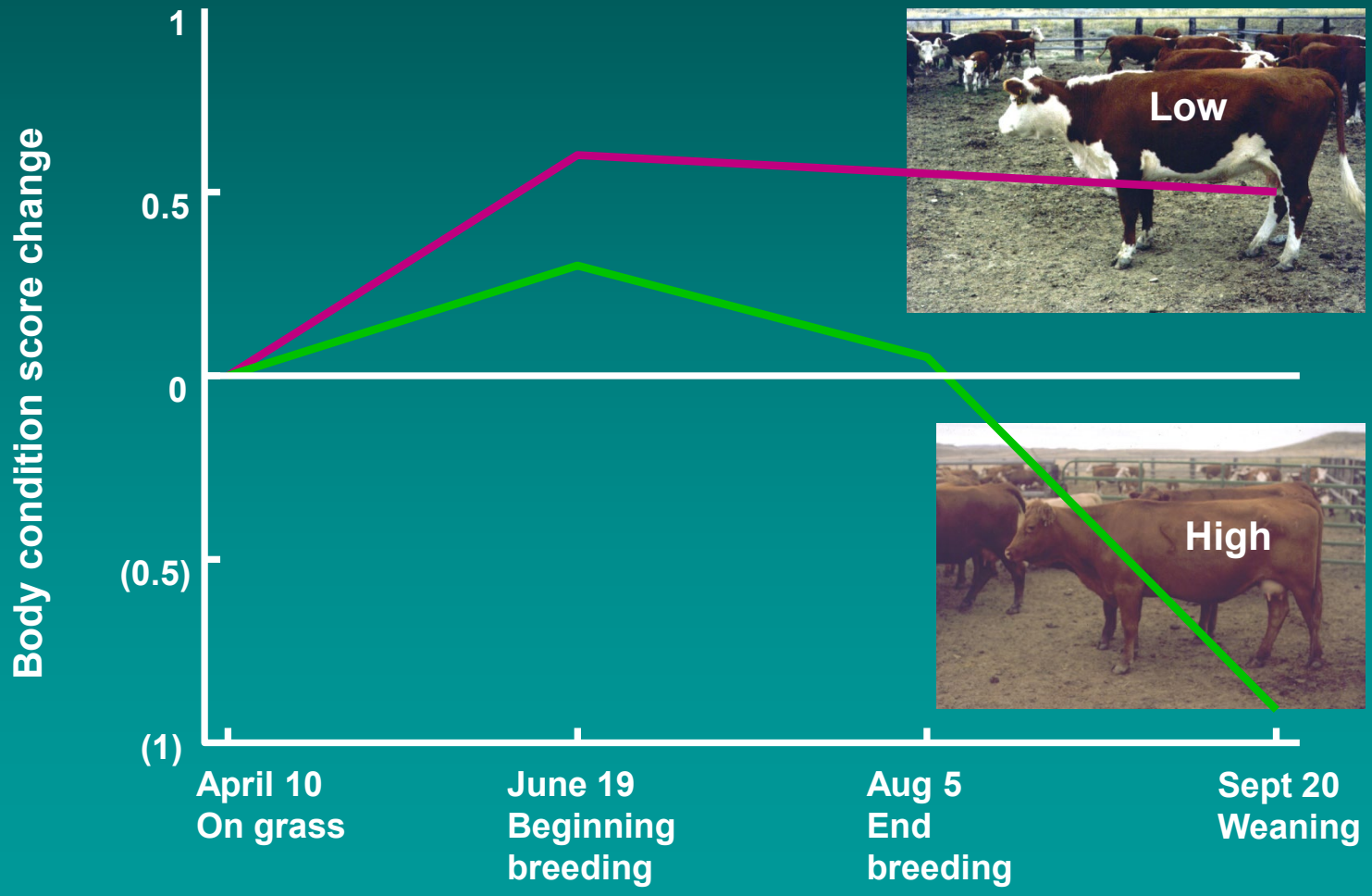


Milk Production by Cows With High and Low Production During Summer Grazing

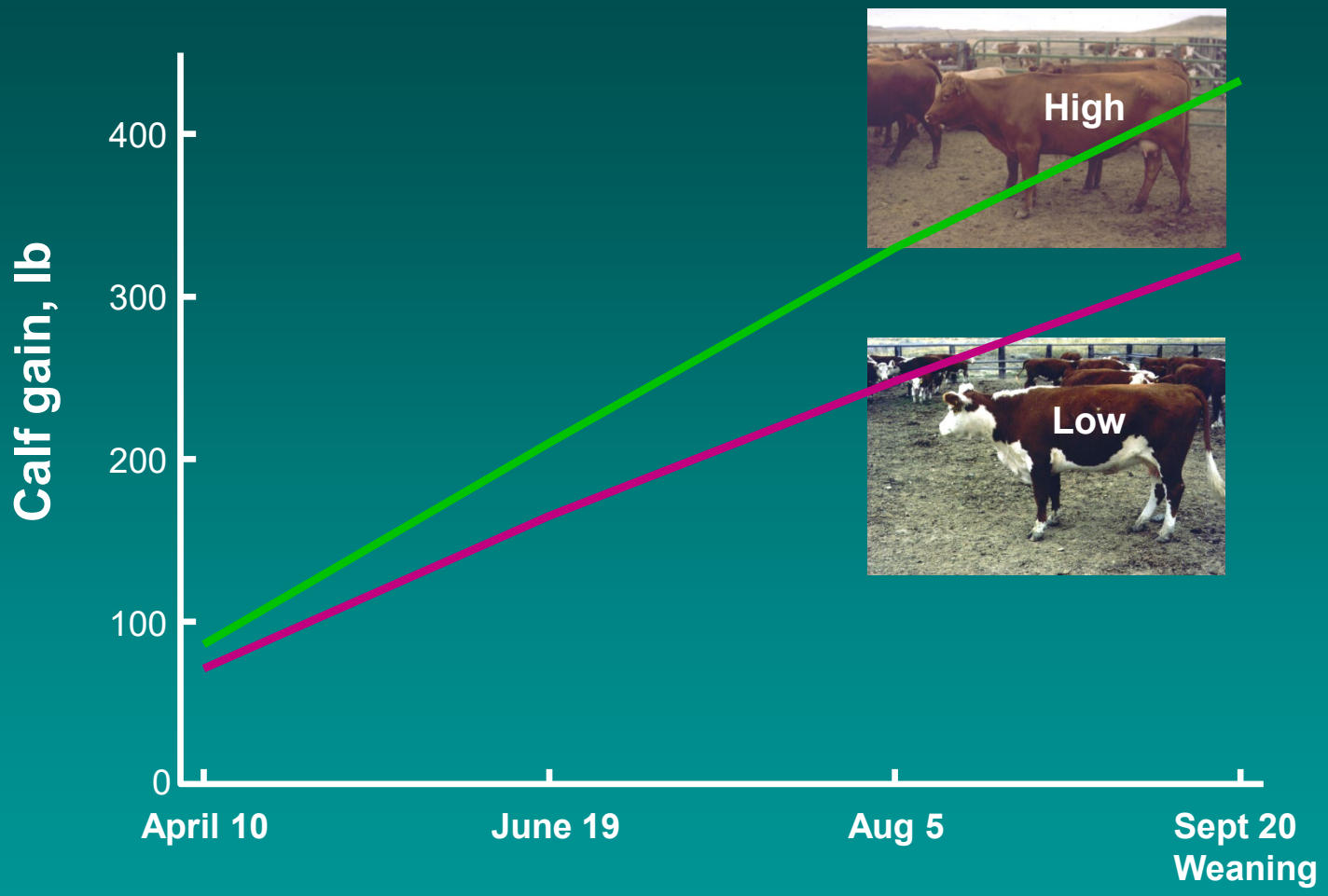


Adams et al. 1993

Body Condition Score Change for Cows With High or Low Milk Production During Summer Grazing

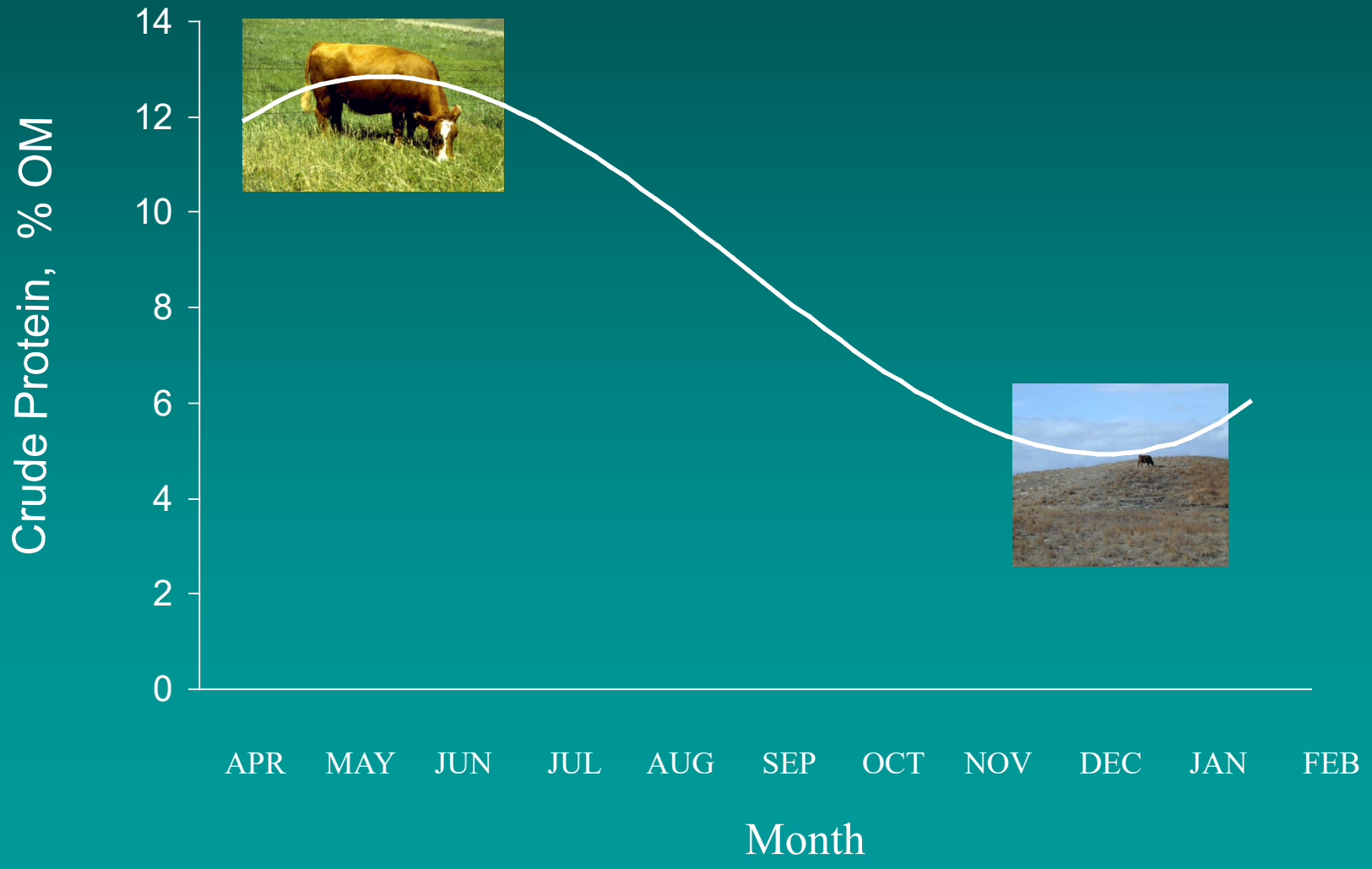


Weight Gain of Calves From Cows With High or Low Milk Production During Summer Grazing

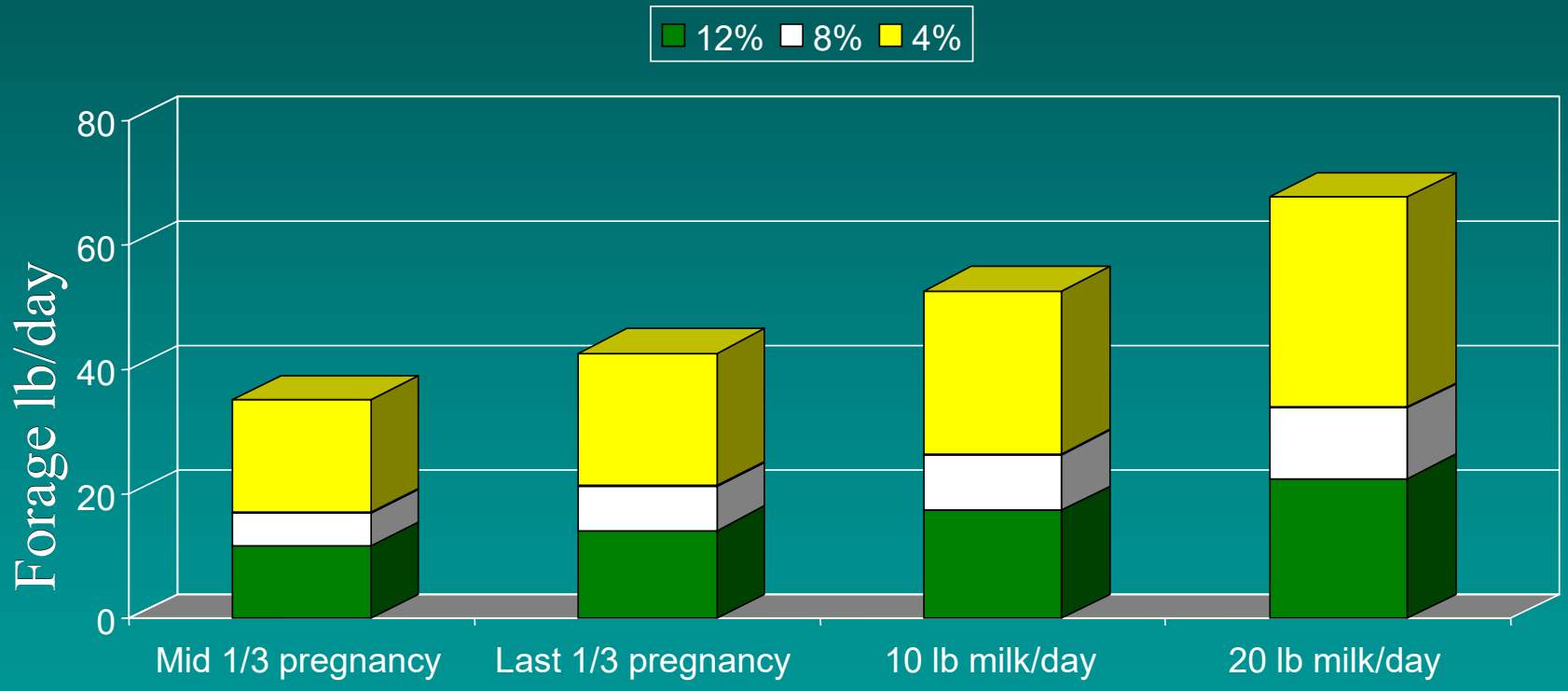


Nutritive content of grazed forages

Crude Protein in Cattle Diets on Sandhills Range

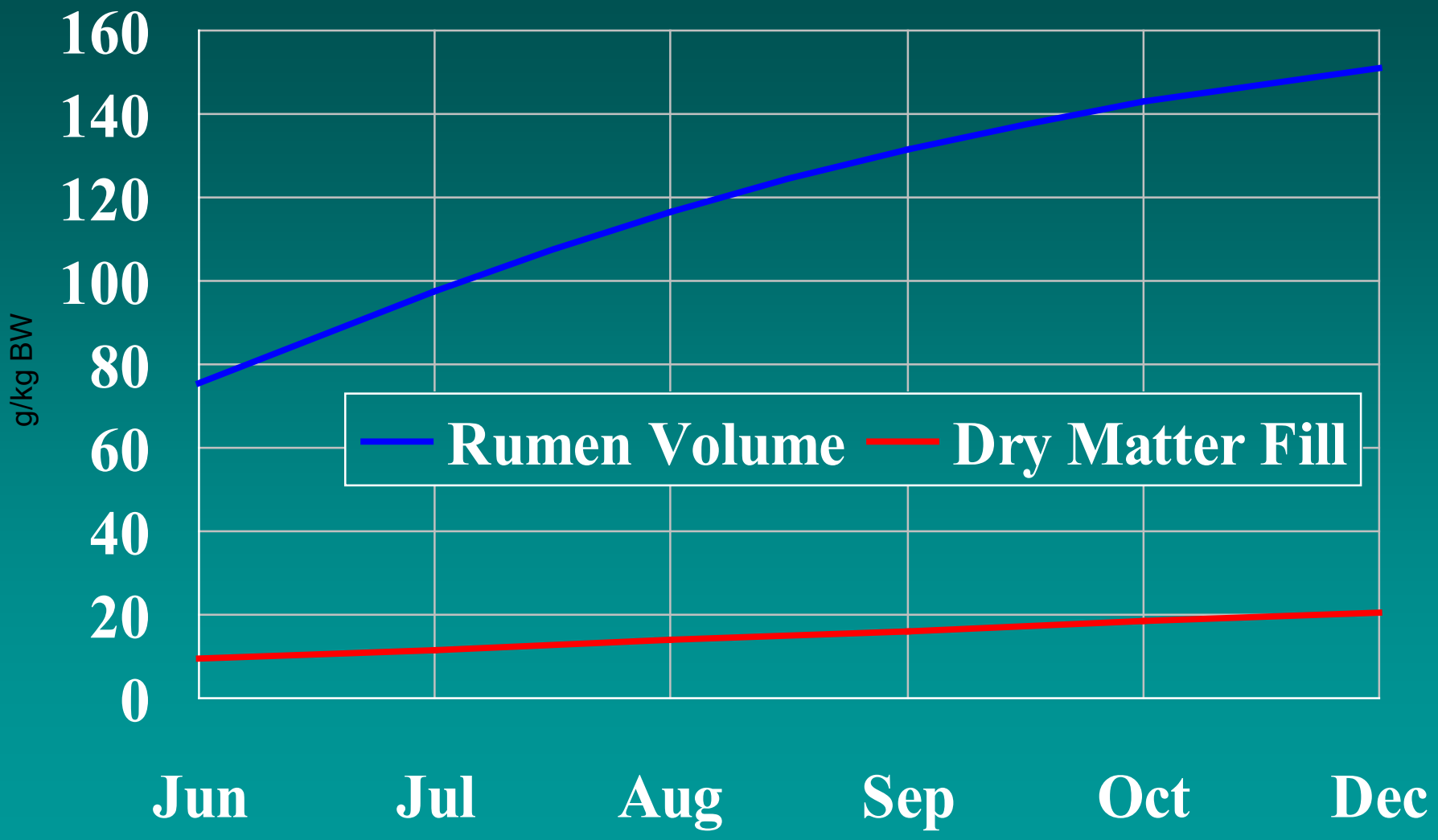


FORAGE INTAKE NEEDED TO PROVIDE PROTEIN REQUIRED FOR PREGNANCY AND MILK (1200 POUND COW)

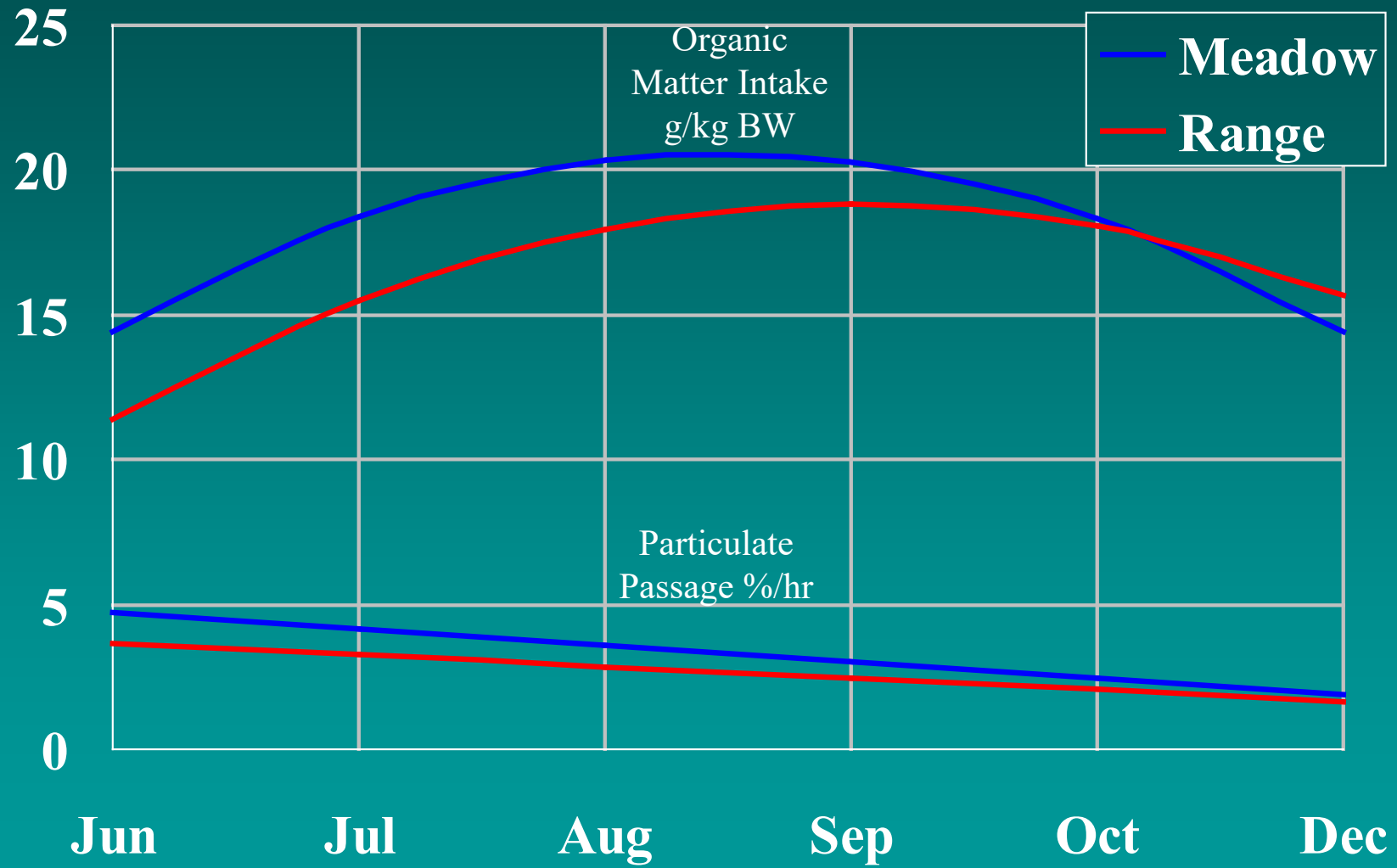


Physiological Status of the Cow

Rumen Volume and Dry Matter Fill of steers grazing Sandhills meadow and range

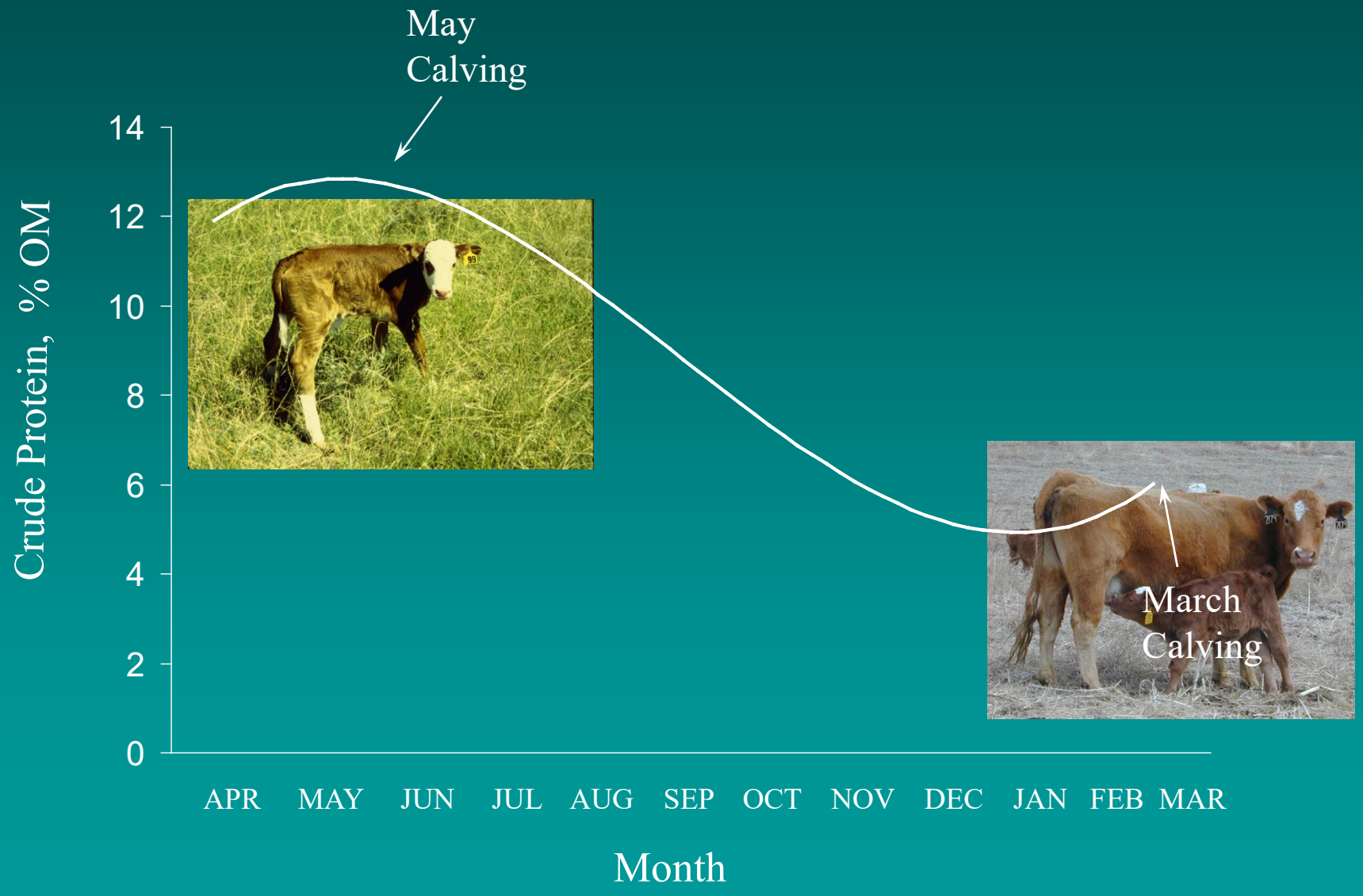


Forage organic matter intake and particulate passage observed using steers grazing Sandhills meadow or range



Calving Date and Milk Production

Crude protein in cattle diets on Sandhills range



Energy – Protein Balance for March and May Calving Dates

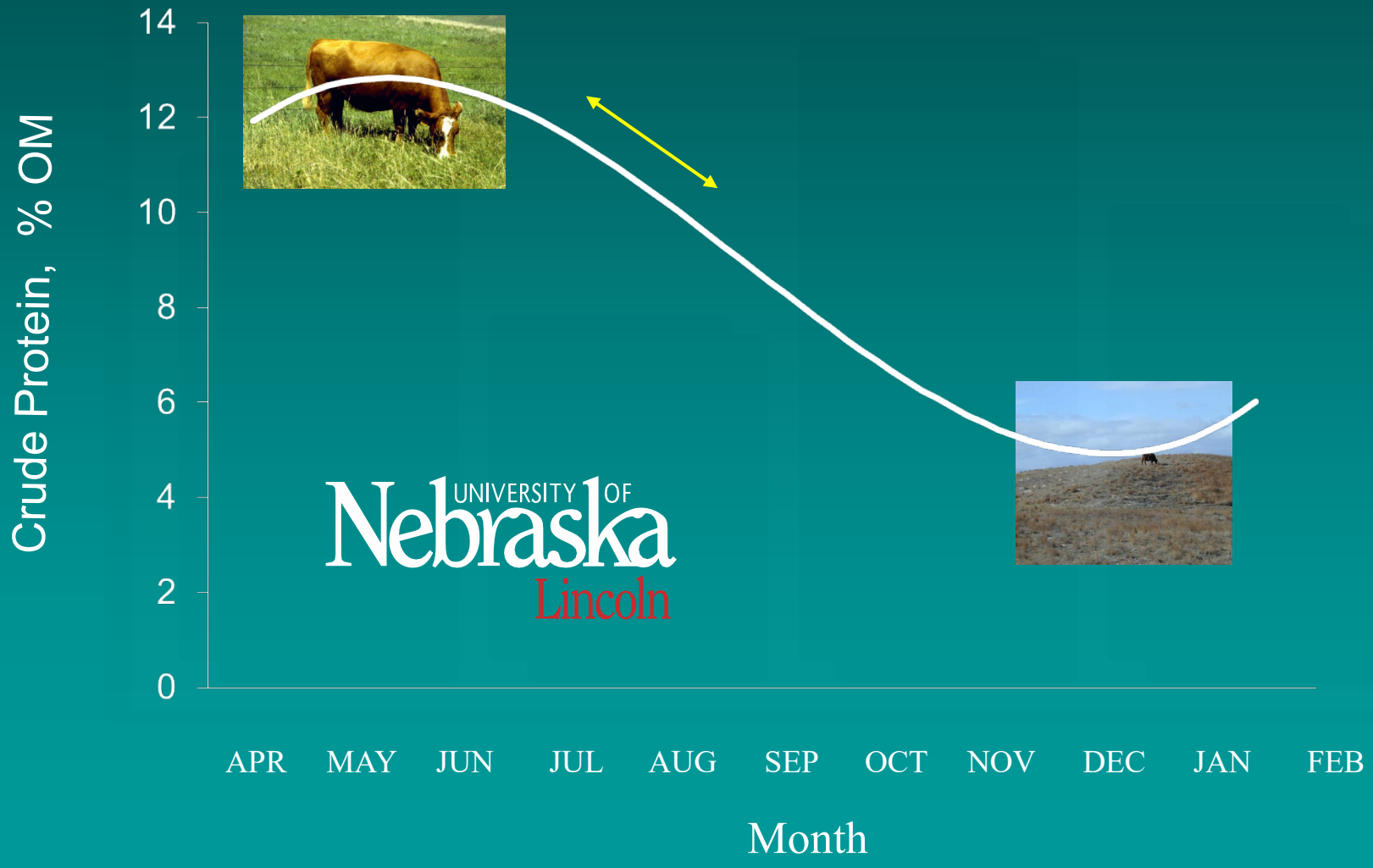
Item	MP balance, g/day	NEm balance, Mcal/day	Status
March 1			
March 10 Calving	-178	-4.3	273 days Gestation
May 10 Calving	-60	-1.92	223 days Gestation
May 1			
March 10 Calving	385	3.97	50 days Lactation
May 10 Calving	446	4.51	273 days Gestation
July 1			
March 10 Calving	46	-.88	110 days Lactation
May 10 Calving	-28	-1.72	50 days Lactation

Energy – Protein Balance for March and May Calving Dates

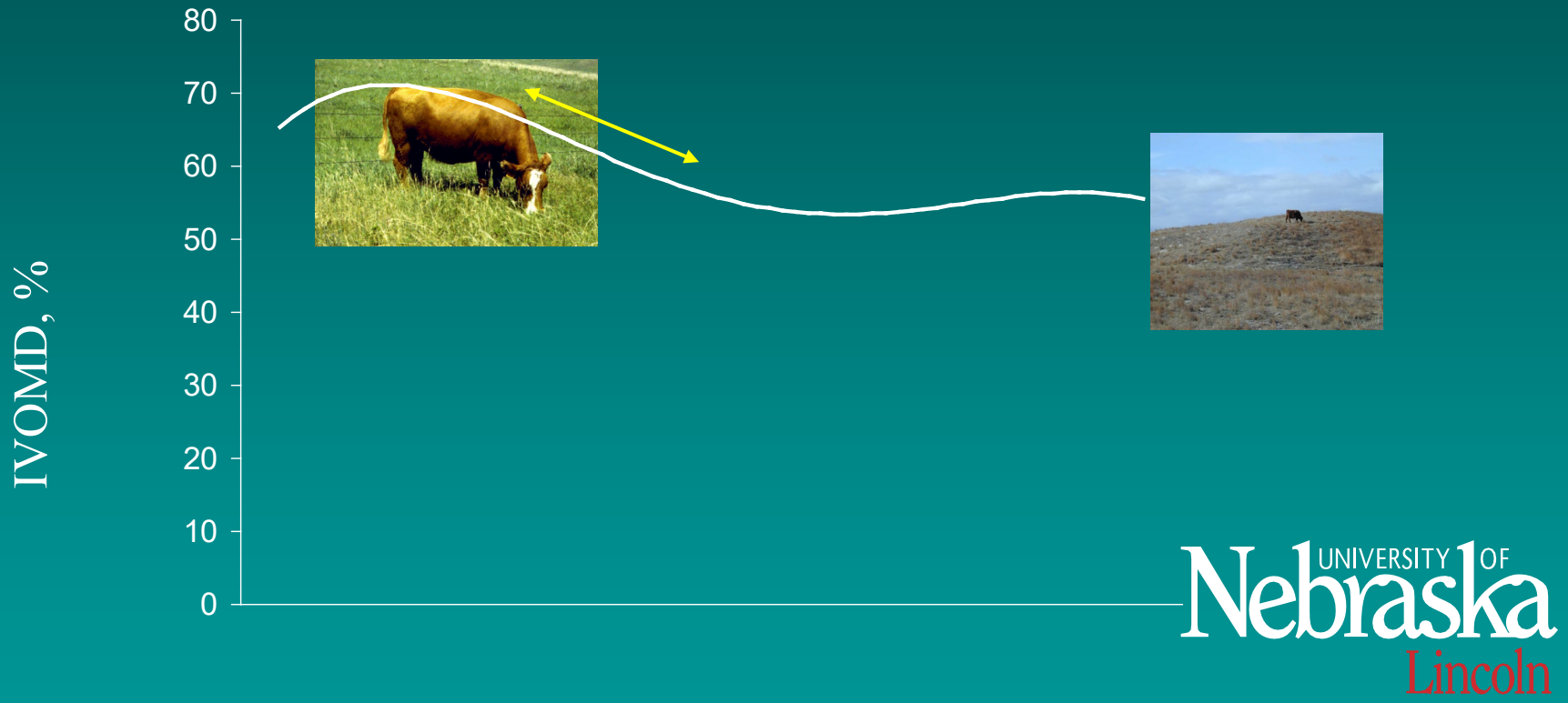
Item	MP balance, g/day	NEm balance, Mcal/day	Status
September 1			
March 10 Calving	-25	-2.52	170 days Lactation
May 10 Calving	-235	-5.61	110 days Lactation
November 1			
March 10 Calving	-125	-4.19	230 days Lactation
May 10 Calving	-243	-5.81	170 days Lactation
Begin Breeding			
June 1; Mar calving	1.3	2.10	80 days Lactation
Aug 1; May calving	-156	-441	80 days Lactation

During a July breeding season cows grazing sandhills range may be deficit in protein and or energy and the deficit will likely be greater during drought. We are seeing an increase in pregnancy rate of 2-yr-old cows fed supplemental protein during the breeding season

Crude Protein in Cattle Diets on Sandhills Range



In vitro Organic Matter Digestibility (IVOMD, % OM) of Cattle Diets on Sandhills Range



University of Nebraska Lincoln

Questions

- **In calving systems that begin calving in May or later cows may be in a large protein and/or energy deficit during breeding but pregnancy rate may be over 90%. Why?**
- **What are the greatest reproductive concerns in calving systems that begin calving May or later?**


Date of Weaning

Energy – Protein Balance for March and May Calving Dates

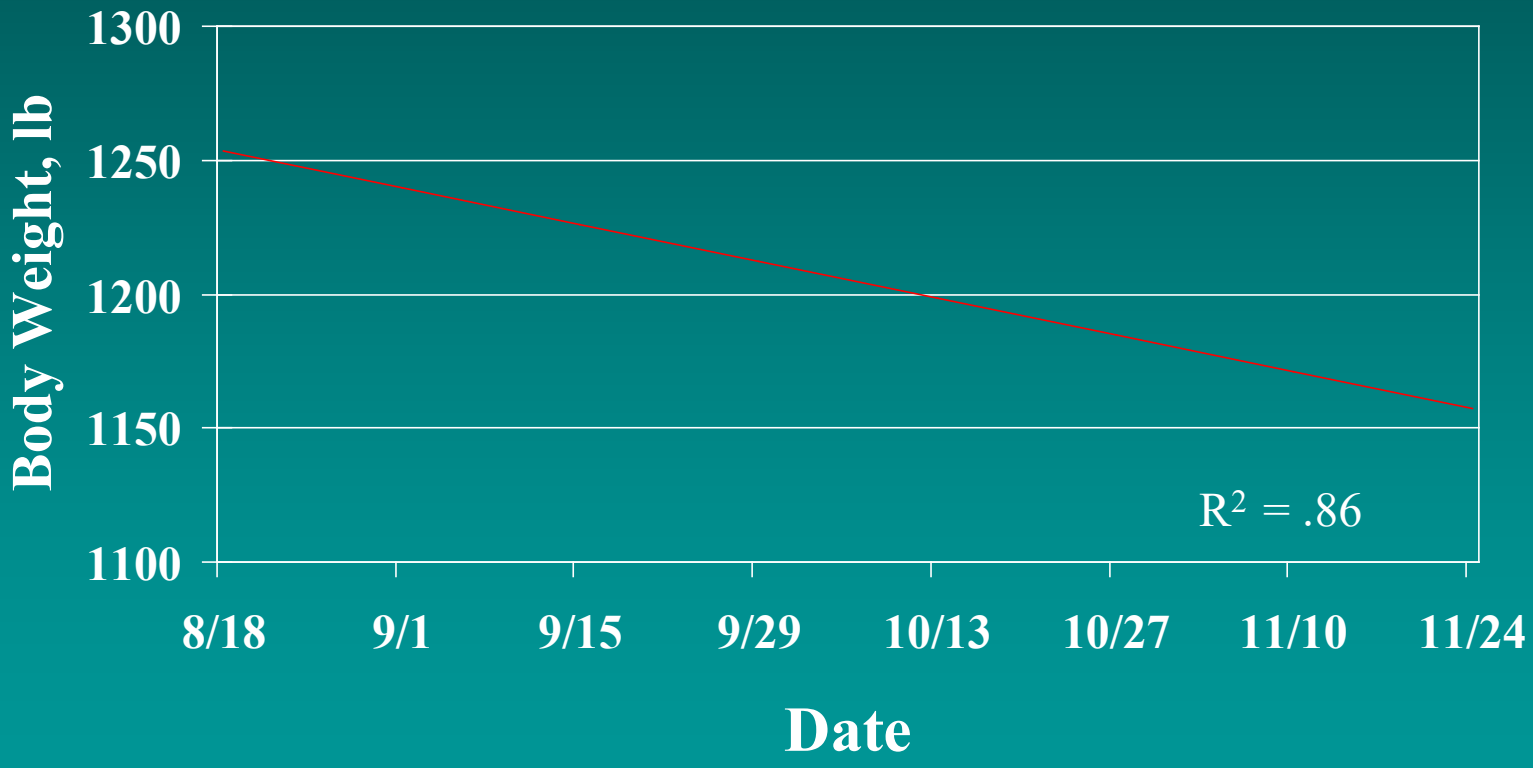
Item	MP balance, g/day	NEm balance, Mcal/day	Status
September 1			
March 10 Calving	-25	-2.52	170 days Lactation
May 10 Calving	-235	-5.61	110 days Lactation
November 1			
March 10 Calving	-125	-4.19	230 days Lactation
May 10 Calving	-243	-5.81	170 days Lactation
Begin Breeding			
June 1; Mar calving	1.3	2.10	80 days Lactation
Aug 1; May calving	-156	-441	80 days Lactation

Weaning Dates

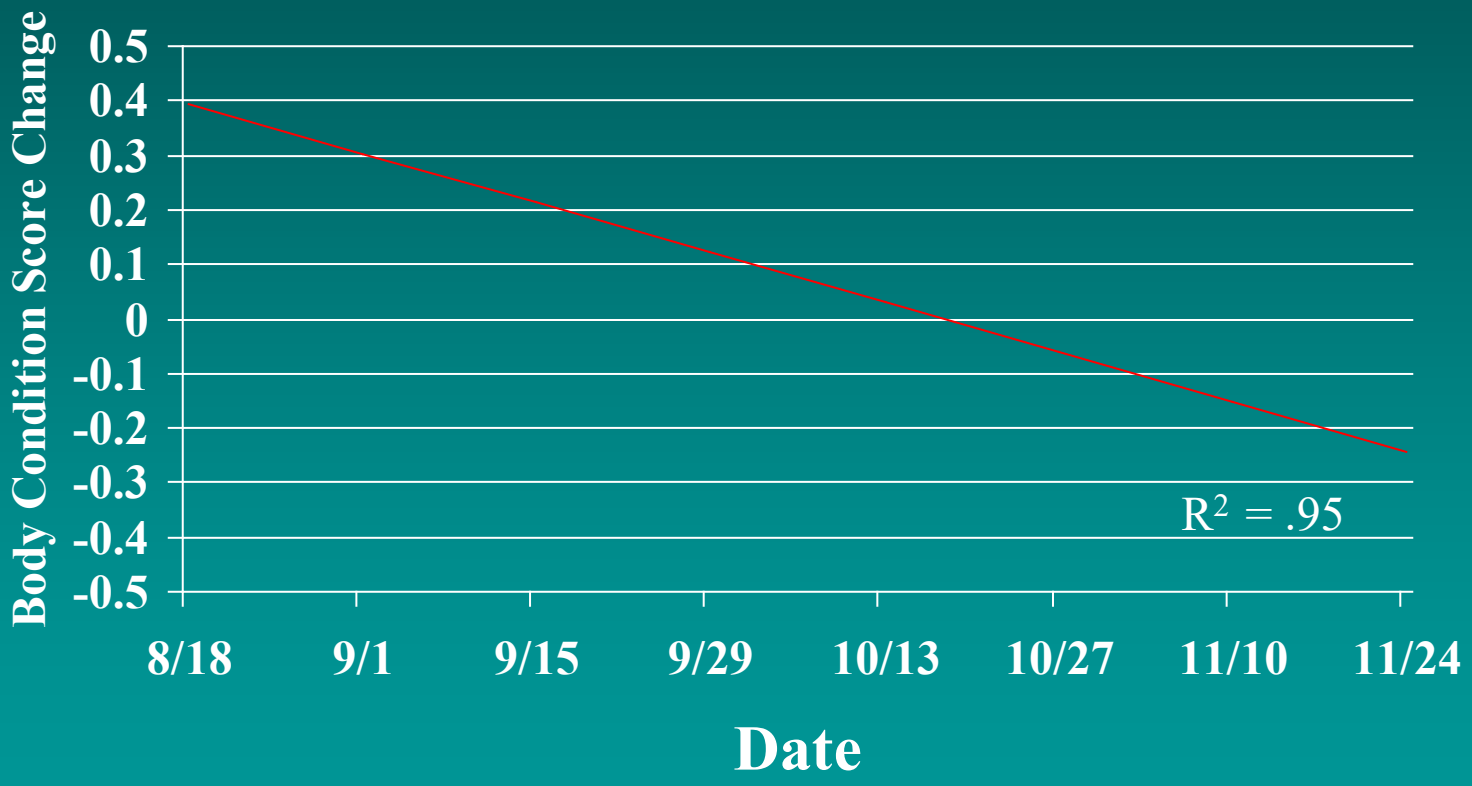
- 8 weaning dates:
  - August 18, 1999 to November 24, 1999
  - August 16, 2000 to November 22, 2000

  (140 to 240 days after calving)

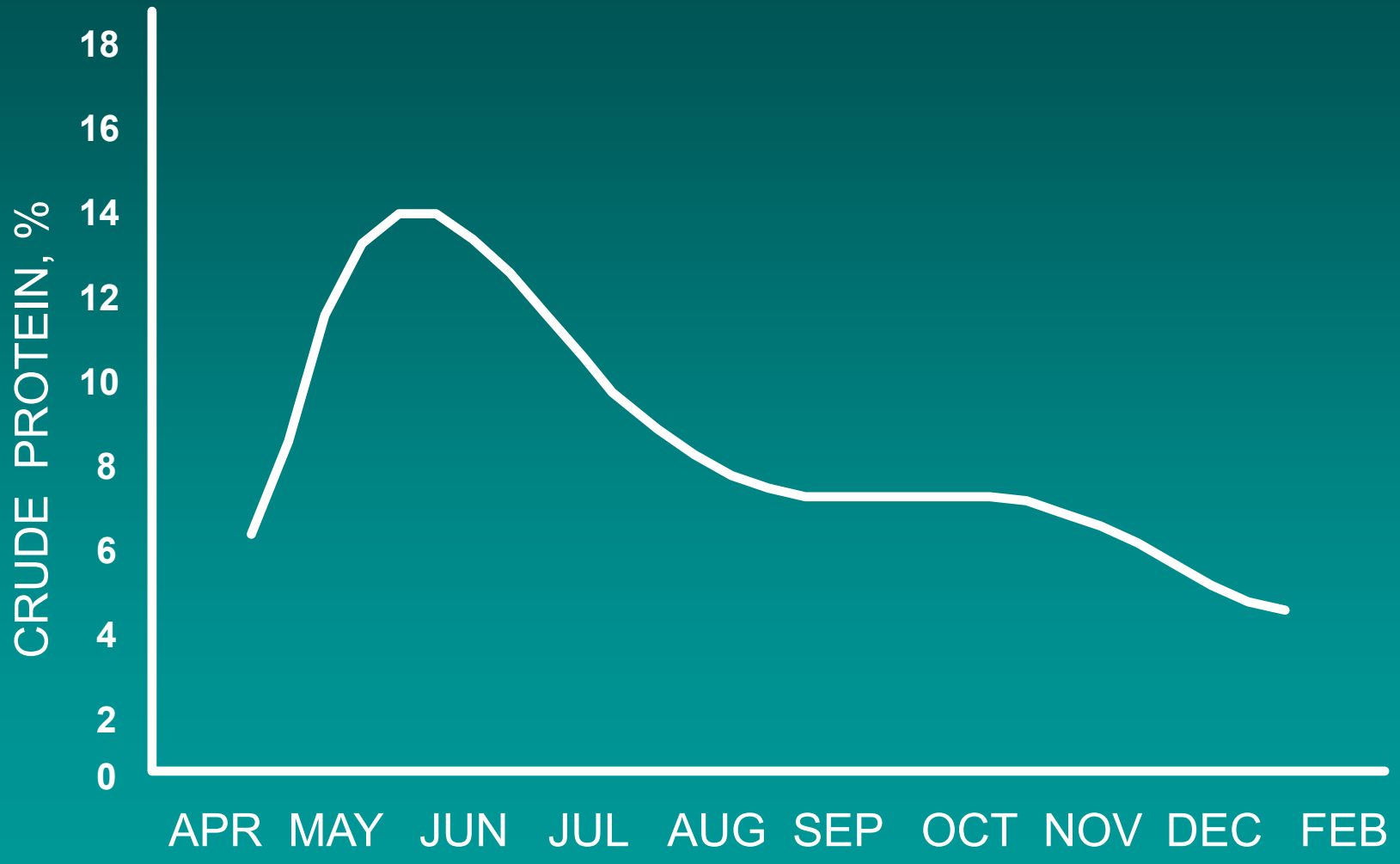
Effect of Weaning Date on Cow Body Weight



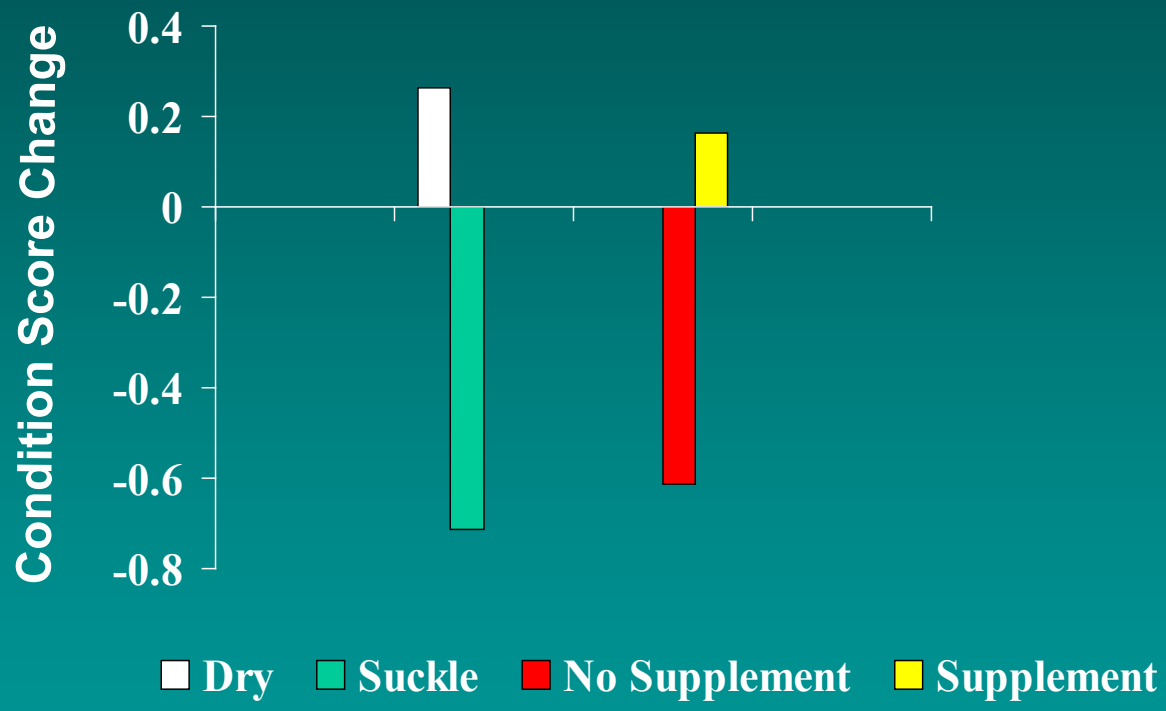
Effect of Weaning Date on Change in Cow Body Condition Score



Crude protein in cattle diets on Northern Great Plains rangeland



Average weaning and supplement effects on cow body condition score from September to December

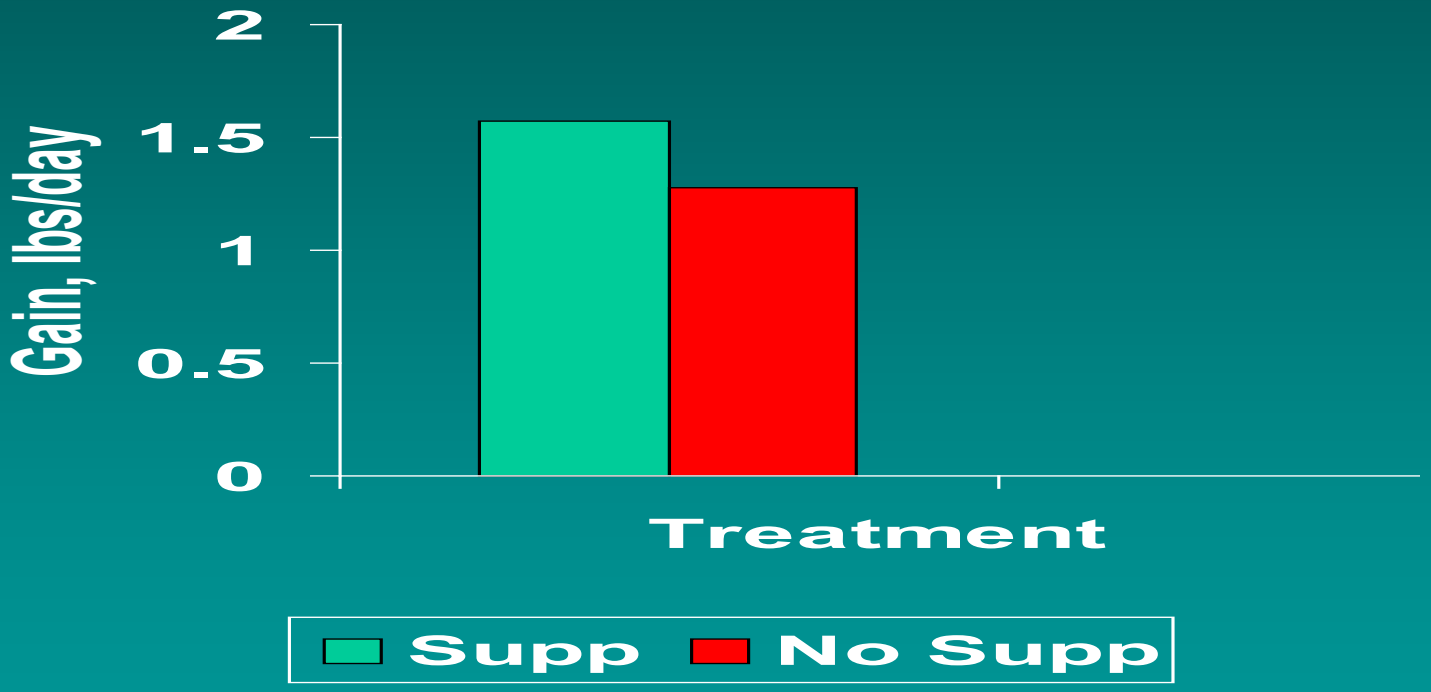


September Wean, with Supplement

December Wean, with and without Supplement

December Wean, without Supplement

Daily gain of calves suckling supplemented and non-supplemented cows



Short et al., 1996

A small amount of milk production can have large negative effects on cow performance with diets low in protein and/or energy

Weaning and Supplement Treatments for March Calving Cows

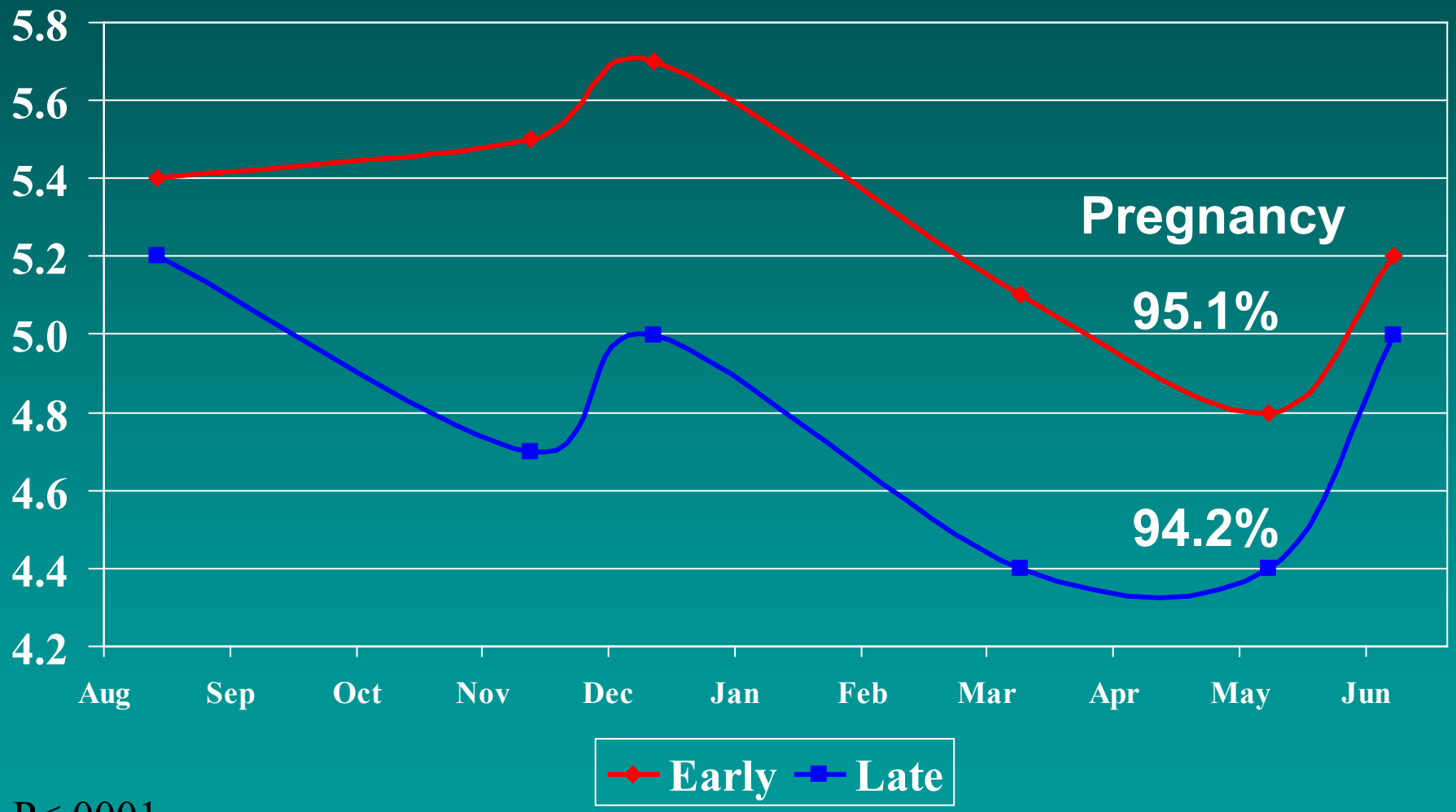
August weaning

1. No protein supplement during winter grazing
2. Protein supplement during winter grazing

November weaning

1. No protein supplement during winter grazing
2. Protein supplement during winter grazing

Effect of Weaning Date on Cow Body Condition Score



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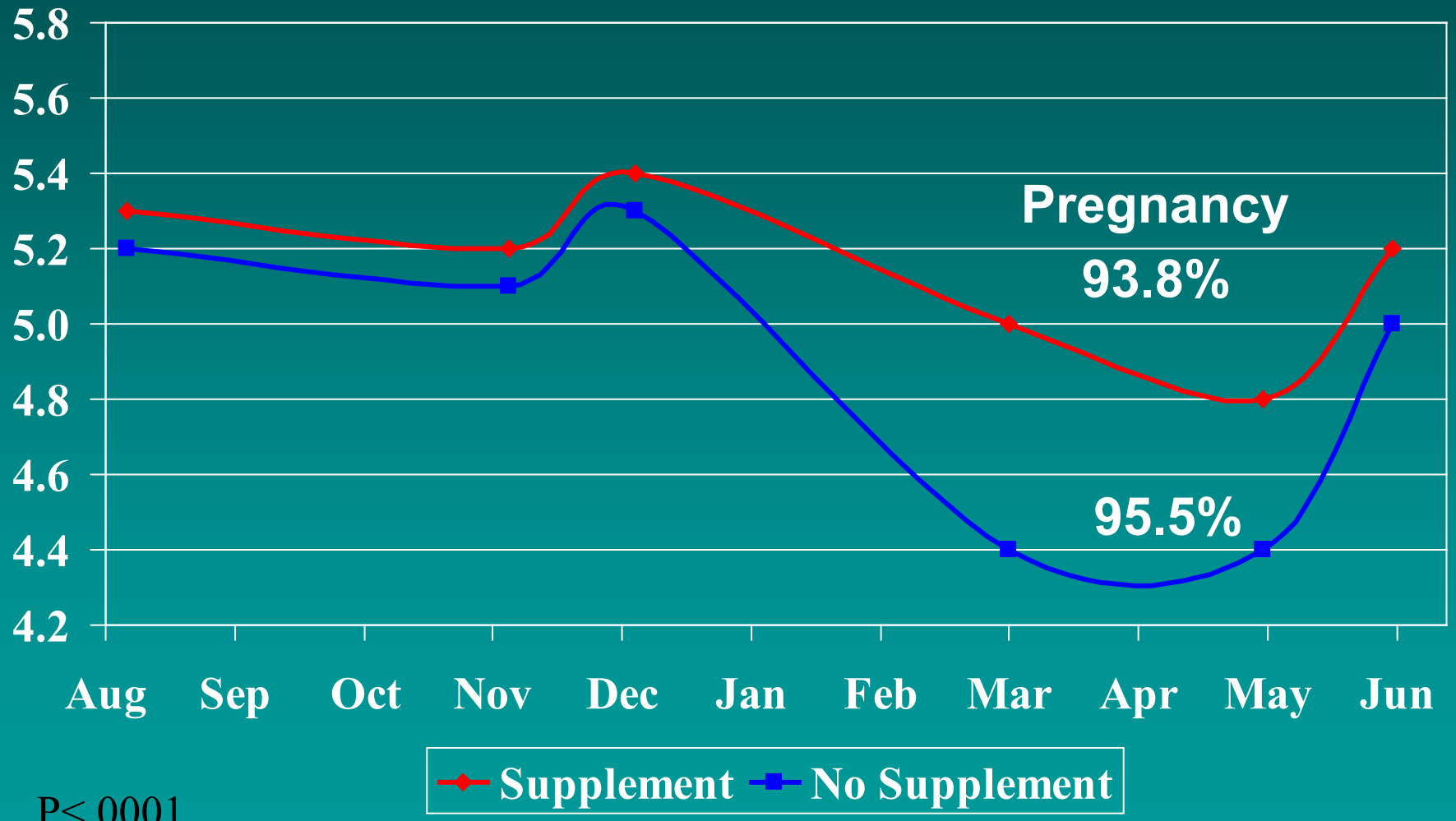
Effect of Protein Supplementation on Cow Body Condition Score



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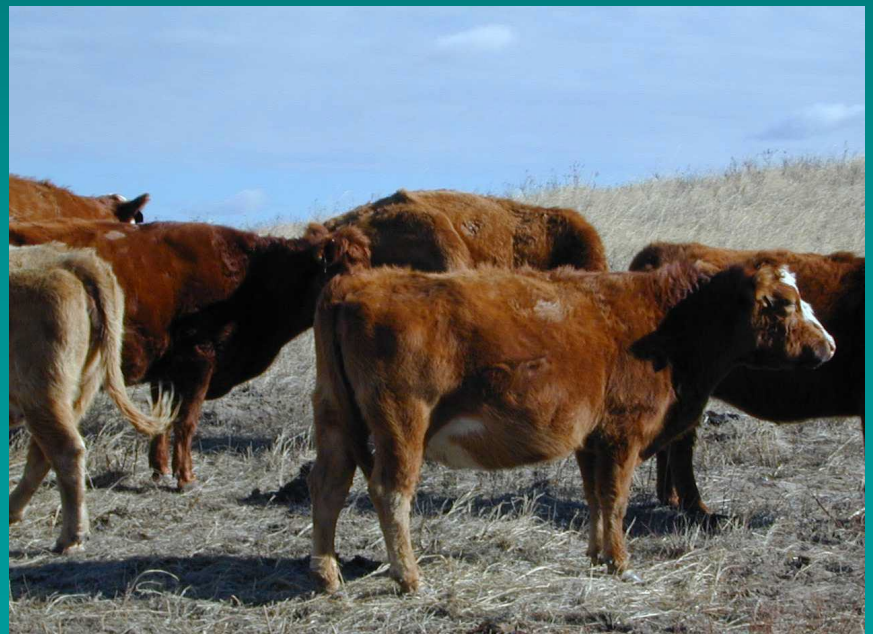
November Wean, with Winter Supplement

November Wean, No Winter Supplement

November Wean, with Winter Supplement



November Wean, No Winter Supplement