Supplementation Approaches for Beef Cows

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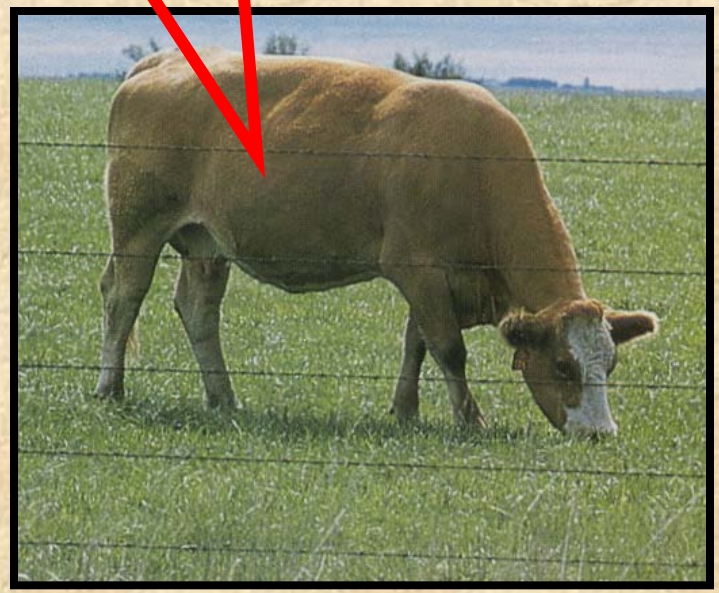
Common Question Areas

- Protein
  - ✓20% vs. 40% cube
- Byproducts
- Cake, Blocks, Liquids, or Tubs
- Mineral

Nutrient Requirements



Microbes have requirements

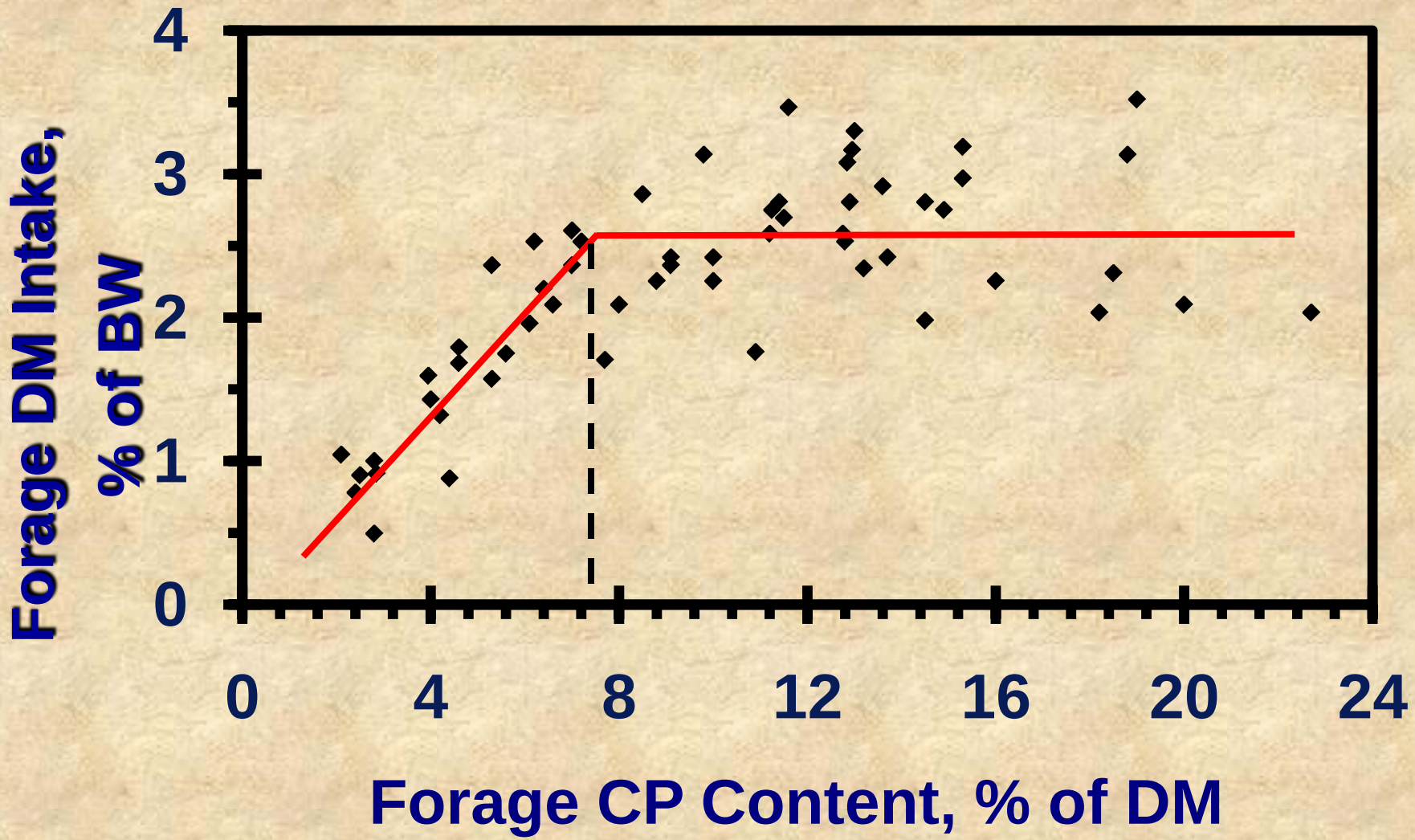
- Meet them first

Cow has requirements

- Often fulfilled when the protein requirements of the microbes are met

- Lactation > Gestation > Dry

Forage intake relative to forage protein content



Adapted from Moore and Kunkle, 1995

Rule of Thumb

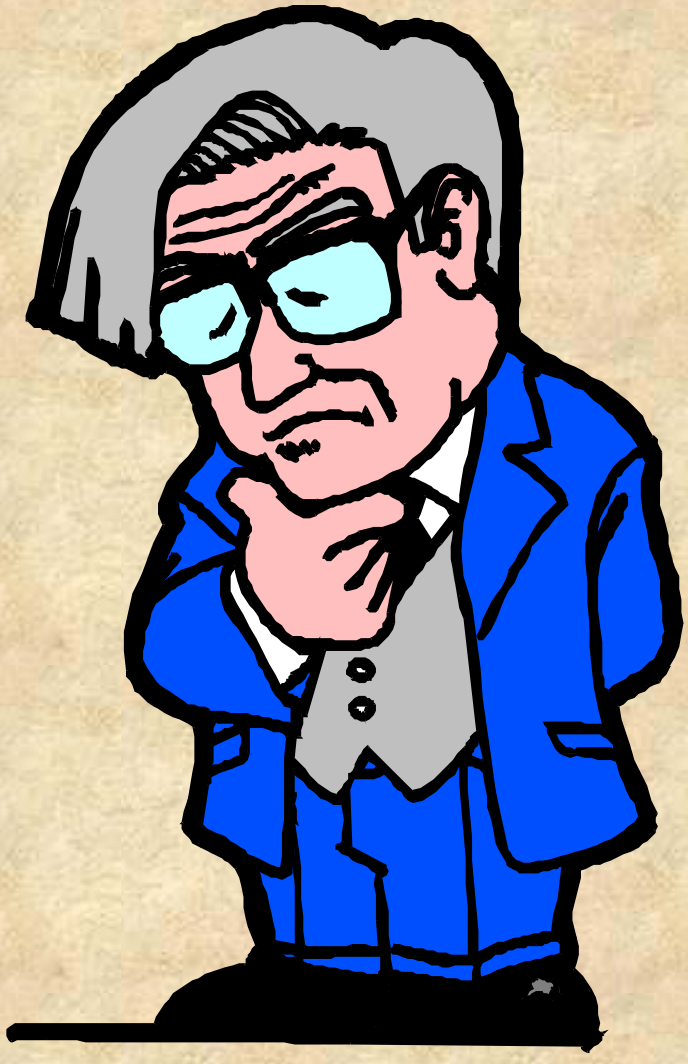
When the diet is < 7 % protein, protein supplementation is usually needed.

#1 Nutrition Question

Protein

or

Energy



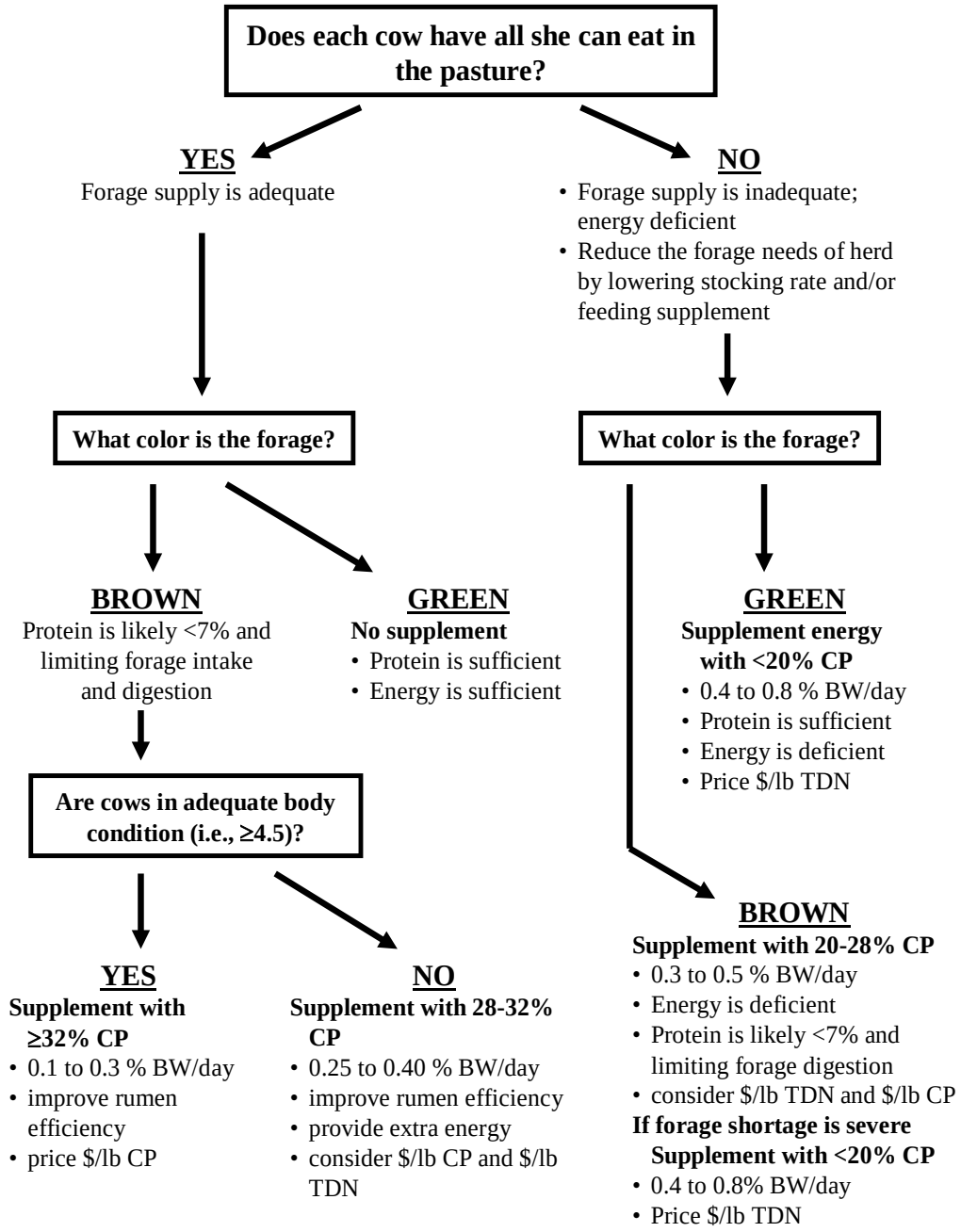
20% vs. 40% Cube

- 48 cows on 49-day trial
- **5.7% CP pasture (avg.)**
- Feed price quote – July 1,2004
- Sawyer et al., 2005

Equal protein / day

	No Supplement	20% Protein ($233/ton)	38% Protein ($273/ton)
Supplement, lb/d		4	2
$/lb CP		$ 0.58	$ 0.35
ADG, lbs	**0.19**	**0.46**	**0.47**
Total Feed Cost		$ 23.30	$ 13.65
$/lb/gain		$ 1.02	$ 0.57

Figure 2. Protein Supplement Decision Guide*



Does each cow have all she can eat in the pasture?

YES

Forage supply is adequate

What color is the forage?

BROWN

Protein is likely <7% and limiting forage intake and digestion

Are cows in adequate body condition (i.e., ≥4.5)?

YES

Supplement with ≥32% CP

- 0.1 to 0.3 % BW/day
- improve rumen efficiency
- price $/lb CP

GREEN

No supplement

- Protein is sufficient
- Energy is sufficient

NO

Supplement with 28-32% CP

- 0.25 to 0.40 % BW/day
- improve rumen efficiency
- provide extra energy
- consider $/lb CP and $/lb TDN

Supplementation Frequency

How infrequently can a supplement be delivered?

Supplements >30% protein

- once or twice a week

Supplements <30% protein

- daily or every other day

Does each cow have all she can eat in the pasture?

NO

- Forage supply is inadequate; energy deficient
- Reduce the forage needs of herd by lowering stocking rate and/or feeding supplement

What color is the forage?

GREEN

Supplement energy with <20% CP

- 0.4 to 0.8 % BW/day
- Protein is sufficient
- Energy is deficient
- Price $/lb TDN

BROWN

Supplement with 20-28% CP

- 0.3 to 0.5 % BW/day
- Energy is deficient
- Protein is likely <7% and limiting forage digestion
- consider $/lb TDN and $/lb CP

If forage shortage is severe, supplement with <20% CP

- 0.4 to 0.8% BW/day
- Price $/lb TDN

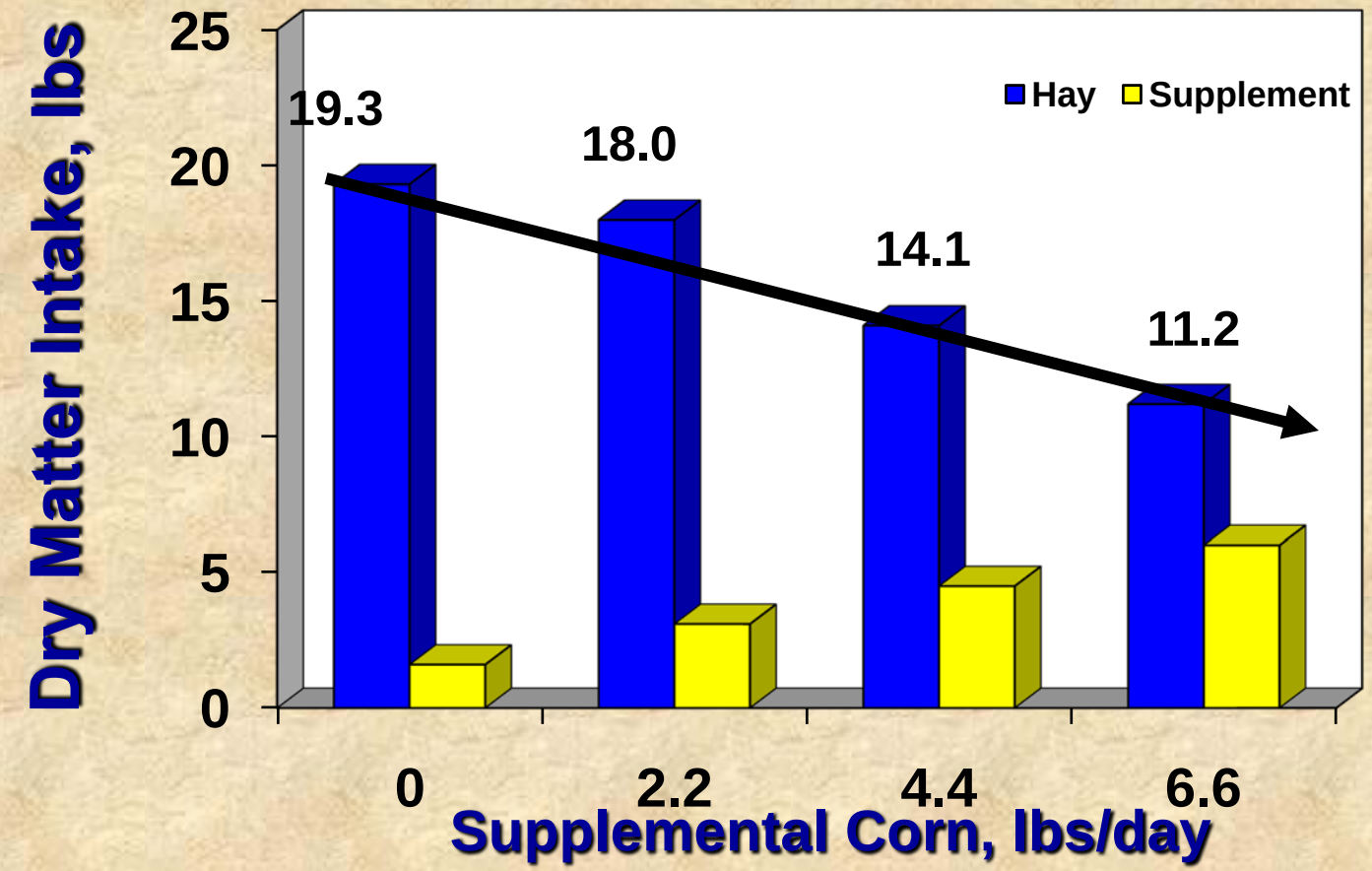
If you chose to feed energy…

Best to energy supplement with inexpensive sources of highly digestible fiber.

- Wheat middlings
- Corn gluten feed
- Soybean hulls
- Fiber-based cubes
- Hay

Grain Supplementation Influence on Forage Intake

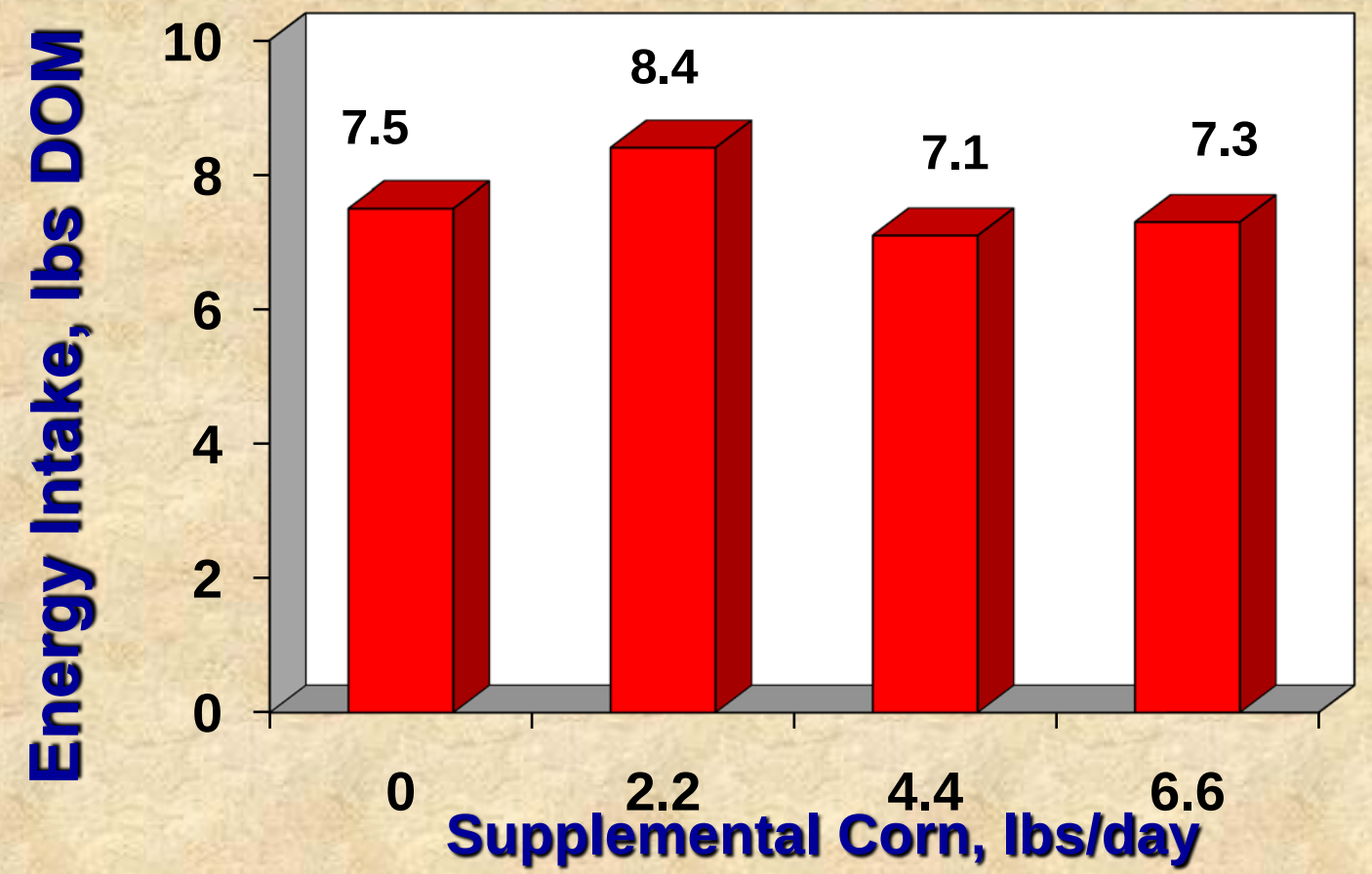
Chase and Hibberd, 1987



As grain feeding increases, voluntary hay intake decreases

Grain Supplementation Influence on Energy Intake

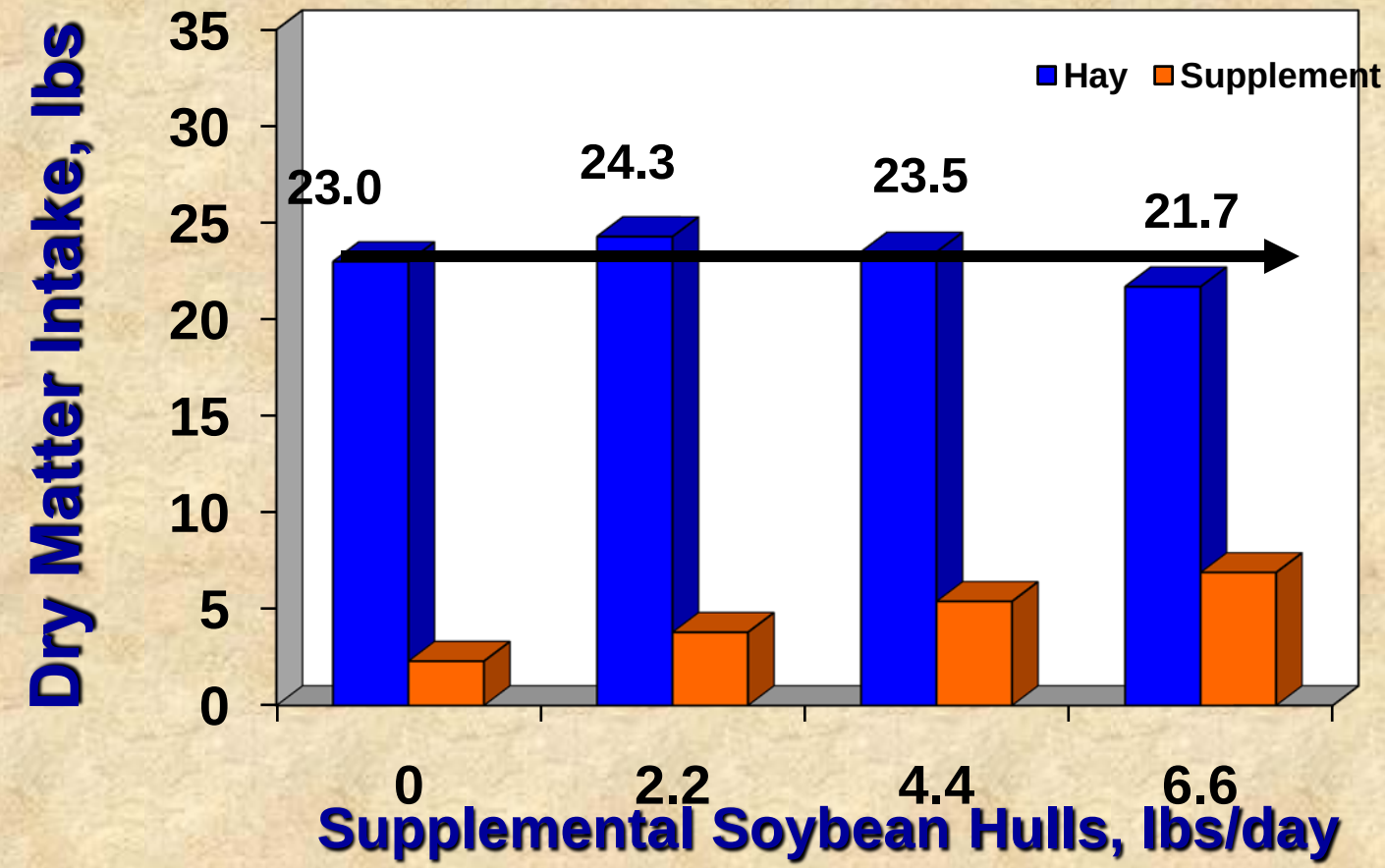
Chase and Hibberd, 1987



Feeding 4 lbs or more of corn did not increase total energy intake

Soybean Hull Supplementation Influence on Forage Intake

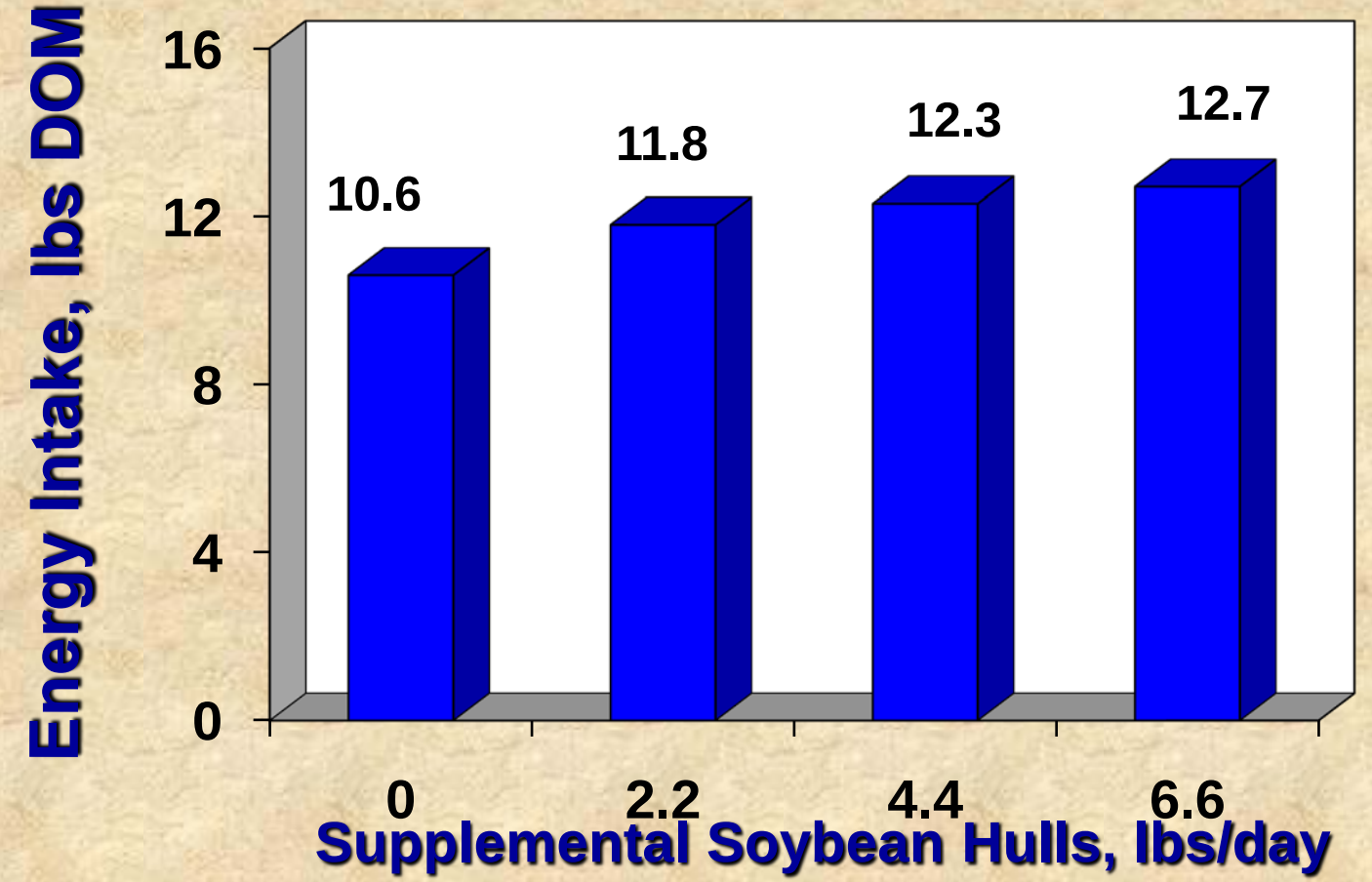
Martin and Hibberd, 1990



As soybean hull intake increased, voluntary forage intake changed little

Soybean Hull Supplementation Influence on Energy Intake

Martin and Hibberd, 1990



As soybean hull intake increased, energy intake increased

Energy Feeding - Rules of Thumb

- **Feeding 3 lbs/day or a high starch feed causes a small decrease in forage intake, but should increase energy intake.**
- **When feeding a high starch feed above 3 lbs/day, every additional 1.0 lb feed reduced forage consumption by 1.5 - 2.0 lbs.**
- **Feeding up to 7 lbs of a highly digestible fiber source to grazing cattle will generally have minimal impact on forage intake.**
- **Generally 1 lb of hay replaces 1 lb of grazed forage.**

Selecting the Best Feedstuff for the Situation

Identify what is needed to achieve goals.

- "Decision Guide" may help

Evaluate potential feedstuffs according to cost/unit nutrient

- Make a cost comparison table

Example cost calculation:

- 20% CP supplement
- $233/ton

2000 lb X 20% CP = 400 lb CP

$233/ton ÷ 400 lb CP = $ .58 / lb CP

Cost / Unit Nutrient Example

38 % CP Cube

- $405/ton
- 2000 lbs * 0.38 = 760 lbs CP/ton
- $405/ton ÷ 760 lb/ton = **$0.53/lb CP**

20 % CP Cube — **Cost 77% more than 38% Cube**

- $370/ton
- 2000 lbs * 0.20 = 400 lbs CP/ton
- $370/ton ÷ 400 lb/ton = **$0.94/lb CP**

18% Alfalfa Hay — **Cost 6% less than 38% Cube**

- $180/ton
- 2000 lbs * 0.18 = 360 lbs CP/ton
- $180/ton ÷ 360 lb/ton = **$0.50/lb CP**

30% CP Tub — **Cost 267% more than 38% Cube**

- $850/ton
- 2000 lbs * 0.30 = 600 lbs CP/ton
- $405/ton ÷ 600 lb/ton = **$1.42/lb CP**

Minerals

Mineral Supplementation Approach

Know what your forage provides!

Consider water antagonists (S, Fe)

Deliver mineral via:

- **Mineral mix**
- **Protein supplement**

Example: Cake + Mineral

Cake fed at 2 lb/hd/day

- @ 1% Phosphorous = 40% of lact. P req.
- @ 2% Potassium = 25% of lact. K req.
- @ 50 ppm Copper = 45% of Cu req.
- @ 70 ppm Zinc = 21% of Zn req.

Mineral fed at 2 oz/hd/day

- @ 8% Phosphorous = 18% of lact. P req.
- @ 2% Potassium = 2% of lact. P req.
- @ 2000 ppm Copper = 112% of Cu req.
- @ 2000 ppm Zinc = 38% of Zn req.

Total:	**Phosphorous**	**= 58% of lact. P req.**
	Potassium	**= 27% of lact. P req.**
	Copper	**= 157% of Cu req.**
	Zinc	**= 59% of Zn req.**

2, 3, or 4 oz Mineral Intake?

Cost/head

2 oz < 3 oz < 4 oz

Reason for 3 or 4 oz intake:

- Meet more of macromineral requirement
  - ✓ Especially P and K

Is it cost effective to meet 100% of requirement?

Total:	**Phosphorous**	**= 78% of lact. P req.**
	Potassium	**= 58% of lact. P req.**
	Copper	**= 253% of Cu req.**
	Zinc	**= 122% of Zn req.**

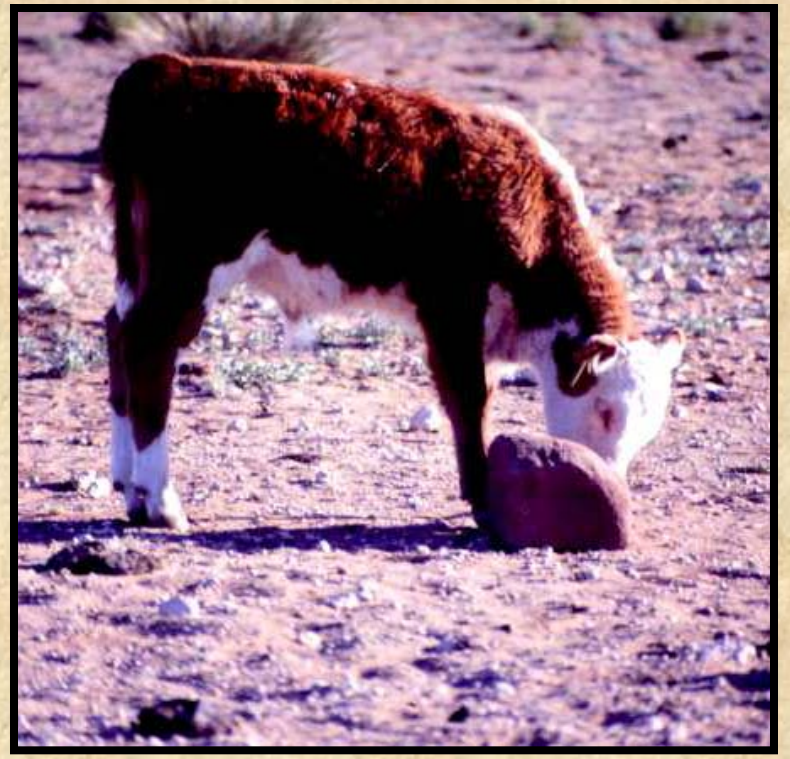
Phosphorous?

Currently 1% Phosphorous

=

about $50/ton in mineral price

Loose versus Blocks



Intake variation?

Wind loss?

Nutrition Summary

- **Manage stocking rates such that energy supplementation needs are minimal**
- **Supplement protein (30-40% CP) when range forage is dry and brown**
- **Supplement energy when forage supply is limited**
- **Deliver protein supplement once or twice a week**

Nutrition Summary

- Deliver energy supplement every day or every other day
- Feed supplement after 11:00 AM
- Provide mineral all year long
- Expect weight loss during winter months, but manage for optimal BCS at calving

Questions

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