

Feeding Dairy Cows to reduce Phosphorus Excretion

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The Challenge for Dairy Producers

- **Properly formulate rations to:**
 - **Optimize milk yield**
 - **Minimize P excretion in urine and feces**



The Challenge for Dairy Producers (continued)

- **Precisely meet requirements for:**
 - **Milk production**
 - **Maintenance**
 - **Gestation**



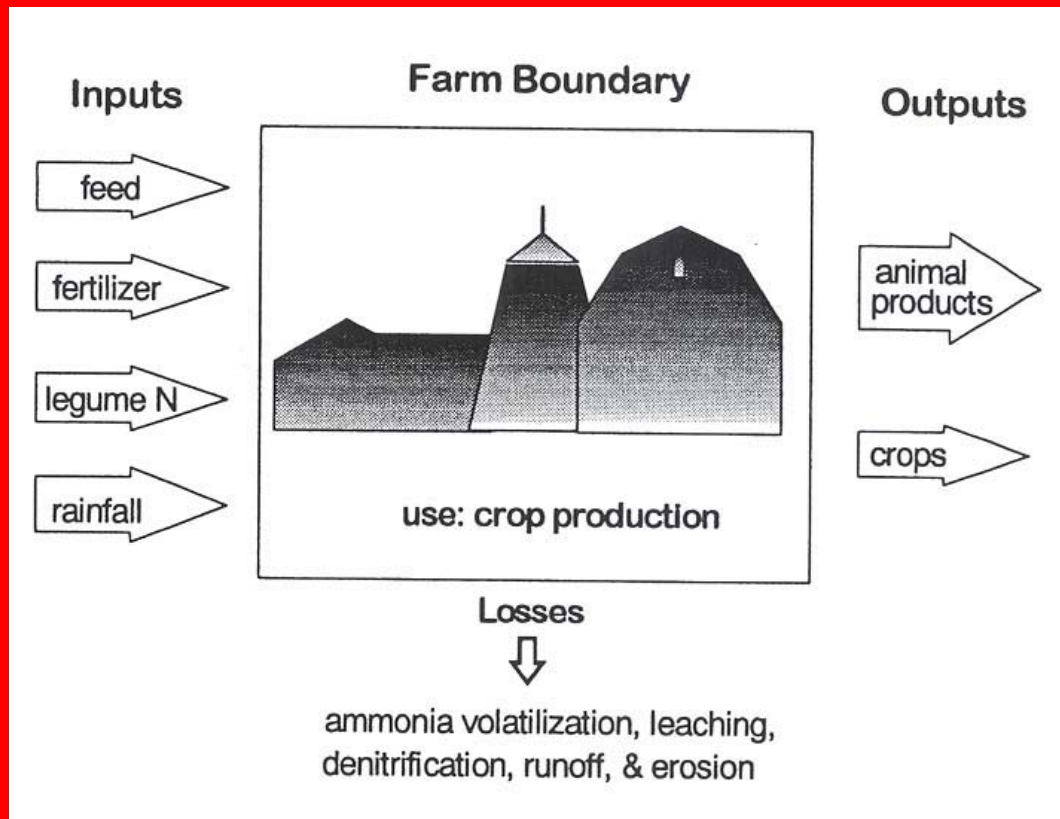
Key Concepts

Goal: Understand how Phosphorus nutrient inputs can be reduced so percent that remain on farm or are lost to the environment is lowered.

Assessment of nutrient balance allows you to determine management options to help decrease inputs, thus reducing cropland needed to utilize nutrients.



Nutrient Flow



Source: Klausner, 1993

P Balances for Dairy Farms

- Percent of P remaining on Dairy Farms ranges from 59% to 81%.*
- > Bottom line: Nutrient accumulation is common for many dairies.

*(according to P balances for typical dairies in New York)



Steps to Minimize Flow of Nutrients onto a Farm

- Feed and fertilizer purchases should be evaluated vs. actual requirements of cattle and crops.
- Use Soil Testing.
- Sample and analyze all feeds: **DON'T USE BOOK VALUES!**
- Grow and use high quality forages to reduce purchase of supplemental feed.



Remember

- Purchased feeds/fertilizers are a major route for nutrients to enter the farm.
- Each purchase must be scrutinized to avoid accumulation of nutrients on the dairy.



Effect of Diet on P Excretion



Pounds P Excreted/day

% P in diet	ASAE Standard	0-30 DIM	31-100 DIM	101-305 DIM	60-day Dry Period	Total (lbs/cow/year)
0.40	0.132	0.123	0.115	0.107	0.101	40
0.45	0.132	0.151	0.138	0.136	0.103	46
0.60	0.132	0.235	0.208	0.185	0.151	69

Source: Van Horn, 1992

Effect of P Intake on P Excretion

- Increasing P content from 0.40% to 0.60% of Diet Dry Matter increases P output from 40 to 69 pounds
 - P requirement for lactating cows is 0.40% (research is being done to see how much below 0.40% P we can go before reproduction and production suffers).
- >Bottom Line: P in the Diet has a huge effect on the yearly excretion of P.



Feedstuffs high in P %

DM %

- Brewers grain, wet and dry 0.55
- Corn distillers solubles, dehydrated 1.37
- Corn gluten w/bran (corn gluten feed) 0.82
- Cottonseed meal (36%) 1.04
- Cottonseed meal (41%) 1.16
- Cottonseed with lint 0.64

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Feedstuffs high in P %

DM %

- Menhaden Fish meal 3.16
- Meat Meal 4.74
- Rice bran 1.70
- Rye distillers grains, dehydrated 0.52
- Sunflower seed meal 1.03
- Wheat bran 1.38

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Milk Production and Land Needs

- As milk yield increases, so do nutrient requirements and nutrient excretion.
- Need at least 2.25 acres per cow for P.



Phosphorus Requirements

- Research shows High Producing cows require 0.40% P in the dietary dry matter for Optimal:
 - milk production
 - reproductive performance
- Dry cows require 0.25% P in dietary dry matter.
- Dairymen commonly feed 0.50% to 0.60% P in some parts of the country.



Feeding Excess P Costs \$\$\$

- P is the most expensive mineral commonly supplemented to dairy cows.
 - A diet containing 0.45% P vs. a diet containing 0.55% P would save about \$0.05 per cow daily.
 - For 100 cows a year, that is \$1825.



Mineral Supplements: Sources of Phosphorus

- Monocalcium phosphate
- Dicalcium phosphate
- Monosodium or ammonium phosphate
- Steamed Bone meal
- Low-fluorine rock phosphate
- Soft rock phosphate



Suggestions

- Group cows according to production, and feed them according to needs over complete lactation
- Analyze feeds- **DON'T USE BOOK VALUE!**
- Limit feed high P by-products
- Feed high quality forages to lower P levels
- Stay away from HIGH P Supplements



Summary

- Cows require 0.40% P in their diet.
- Overfeeding cost producers money (\$\$\$).
- Overfeeding P increases land mass requirements for animal waste application exponentially.
- Balancing rations to lower P can be cost effective and lower outputs.

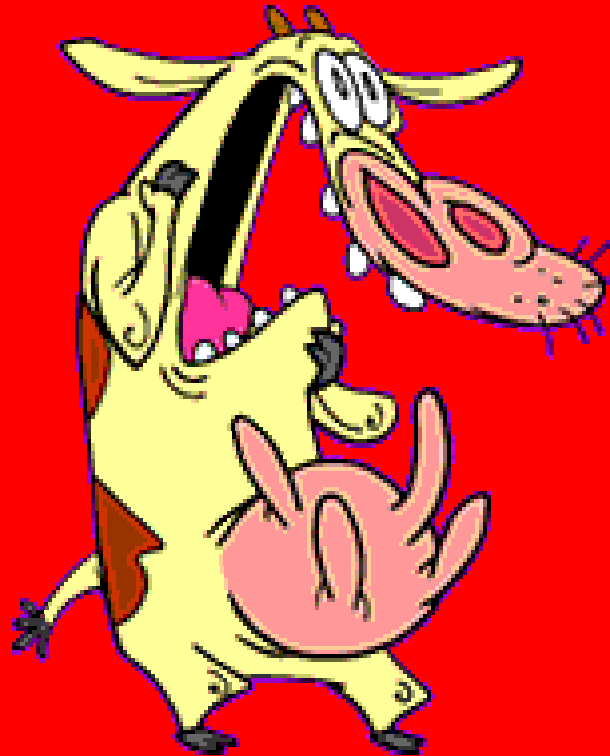


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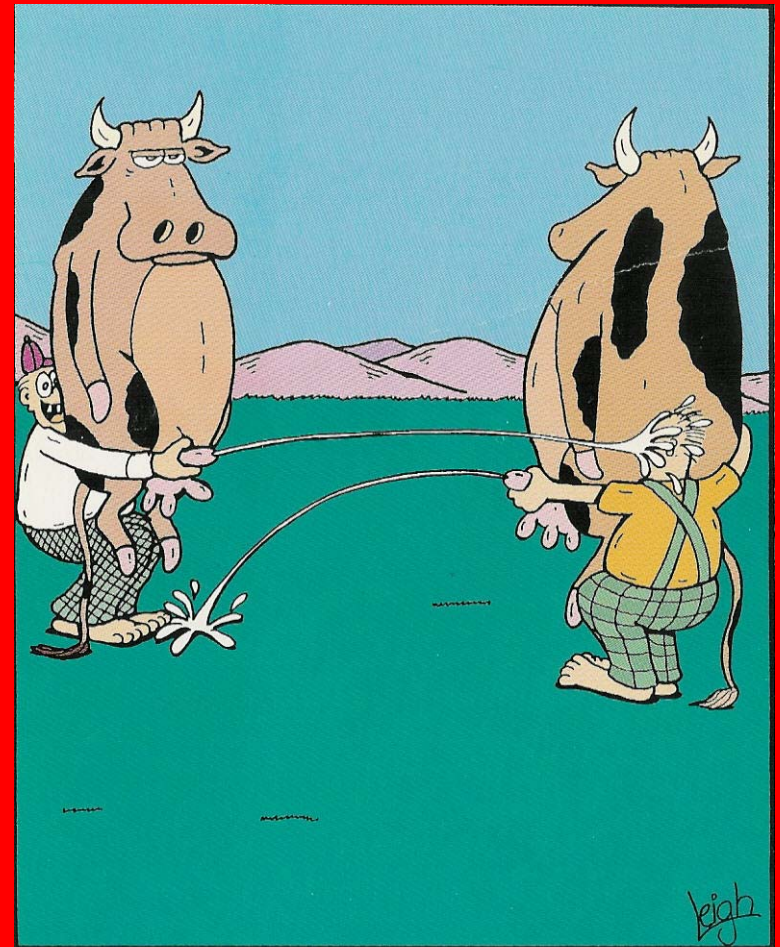
Questions????



The End

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Supersoaker fights on the dairy farm.

