PHOSPHOROUS MANAGEMENT ON A MARYLAND DAIRY FARM

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Nutrient management is not a policy unique to Maryland or the Chesapeake Bay Watershed. It is a national policy dealing with all of our water resources. Even if there was no Water Quality Improvement Act of 1998 or Nutrient Management Law in Maryland, eventually Maryland dairy farmers would be required to deal with reducing phosphorous (P) loading on their farms. As it is, this law requires that nutrient management plans (NMP) written by July 2004 must be balanced for P on certain high P fields and these plans are to be implemented by 2005.

Dairy farmers in Maryland have a choice. They can choose to reduce P loading on their fields or wait until an MDA inspector comes to call. Reducing P loading can be accomplished by increasing P removal by double-cropping forages, removing manure to other farmland or reducing the amount of P being wasted through the cow.

The National Research Council (NRC) recommends high producing dairy cows be fed a ration containing .38% P in terms of dry matter intake. The historic recommendation of a .5% P level is recognized as unnecessary, wasteful, and largely responsible for P loading on dairy farms. But old habits are hard to break no matter how costly.

A certain Maryland dairy farmer mindful of his high P soils and the impending deadline imposed by the nutrient management law decided several years ago to begin reducing the supplemental P in his dairy ration. This is a 125-cow dairy plus replacements on 210 crop and 15 pasture acres. Herd average is about 21,000 lbs. By July 2001, his total mixed ration (TMR) was tested at .43% P. The manure analysis taken at this time was plugged into his NMP and showed that P was still his limiting nutrient. The farmer still needed to export over 200,000 gallons of manure annually in an attempt to balance P application to his fields. Then by early 2002, he removed all supplemental P from the ration. All ration P is now provided by high quality forage and grain. The following data shows several TMR analyses. The ration is balanced for 70 lbs. of milk.

DATE	%P
04-09-2002	.33
12-16-2002	.34
03-13-2003	.35
06-13-2003	.35

In terms of his NMP, the immediate impact of reducing ration P to this level is the drastic reduction in the amount of P being wasted through the cows as shown by the following manure analysis data:

DATE	% P_20_5	lbs. P/1000 gal.
10-97	.22	18.03
11-99	.14	12.15
07-01	.12	10.49
03-03	.06	5.27

Reducing the ration P level from .43% P in 2001 to .35% in 2003 (a 19% reduction) reduced the P wasted through the cows by 50% (.12% to .06%).

This dairy farmer can now plug his manure analysis into his NMP and **P is no longer the limiting nutrient!** Now his NMP can be written for the nitrogen (N) needs of the crop. On a 20 ton corn yield, the manure application was increased from 6,912 gal/acre to 13,839 gal/acre on no till ground to supply all the N required by the crop. An additional 6,000 gal/acre can be applied to the winter annual double-crop.

Now all of the manure can be recycled on the farm. This saves $500 in pumping costs to remove 200,000 gallons of manure. It also saves $3,000 in N fertilizer that was lost in that exported manure. And there is the $2,000 that used to be spent on wasted P mineral. There was one other item we had a problem attaching a dollar figure to—the peace of mind knowing that regardless of what regulations may come down the road, the farm is in P nutrient balance.

But what about the poor cows being deprived of their P fix? The following data is from this farm's DHI records:

DATE	January 2002	June 2003
CALVING INTERVAL	14.2 months	13.2 months
SERVICES/PREGNANCY	3.1	2.6
DAYS OPEN	131	121

Here is the farmer's quote. "The cows are finally getting over their phosphorous toxicity!" And herd production is still at 21,000 pounds.

This particular farm is meticulously managed. Decisions are made carefully using input from the several consultants that form this farmer's advisory team. But ultimately the management decisions are the farmer's.

Phosphorous is a critically important macro-mineral in our dairy rations. And any dairy farmer would be ill-advised to simply drop all supplemental P from the ration. However, each dairy farm manager must decide how they can best achieve P balance on their operation. If P reduction in the dairy ration is considered, then use your entire advisory team and make any changes gradually.

Phosphorous-balanced NMP are not just some regulatory pipe dream. Dairy managers in Maryland can reduce P wasted through their cows, reduce P loading on their farms, and write P-based Nutrient Management Plans.