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How much can diet modification do to reduce manure phosphorus surpluses?

Diet modification to reduce phosphorus (P) concentrations in manures has been developed in response to environmental concerns over P losses from animal agriculture to surface waters. We used USDA-NASS statistics on animal numbers and crop production to calculate county scale mass balances for manure P production and P removed in harvested portion of crops. We then calculated the effects diet modification could have on reducing manure P surpluses. While spreading manure evenly over all crop acreage within a county is unlikely to occur, these calculations give a good indication as to the impact diet modification to reduce P can have at a regional or national scale. There was a high degree of regional variability in manure P surpluses, for example, with the large crop acreages in the grain belt leading to large P off take in crops preventing most P surpluses. In 90% of counties there was a deficit of manure P relative to crop P removal, and therefore only a manure P surplus in 10% of counties. Diet modification decreased the percentage of states with a manure P surplus from 10% to 8%, a decrease of 20%. Diet modification decreased the percentage of counties with the greatest surpluses of manure P (>30 kg/ha) by two thirds, from 3% of all counties to only 1%. Diet modification to decrease manure P is an important part of strategies to alleviate environmental concerns associated with surplus manure P in many areas, but additional strategies to deal with manure P surpluses will be needed in some areas.

Author: Rory Maguire
University Affliation: Virginia Tech
Co-Author(s): David Crouse and Steven Hodges