Brief
Managing Ammonia and Nitrogen in Livestock Facilities

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Preamble

Atmospheric ammonia above 10ppm is detrimental to the health and performance of broilers, turkeys and other livestock (Blake and Hess, 2001). Ammonia levels above 25ppm in poultry houses can damage birds' respiratory system, cause eye ulcerations and allow for infections from pathogenic bacteria. Ammonia has also been associated with a high incidence of dermatitis and soft tissue lesions.

Ammonia is generated by microbial activity on fecal nitrogen under wet and alkaline (pH>7) conditions. Ureolytic bacteria such as Bacillus pasteurii grow in moist litter that has a pH above 8.5 and is responsible for the formation of ammonium ions and/or ammonia. Controlling high levels of ammonia in poultry houses and livestock barns can be accomplished by lowering the pH of the waste (a caustic and expensive procedure) or by altering the microbial population of the waste material.

Application of beneficial microbes and enzymes reduce ammonia in livestock facilities by preventing the ureolytic bacteria from dominating the microflora of the waste. By preventing nitrogen from forming ammonia, a greater concentration of nitrogen remains in the manure as organic nitrogen.

Controlling Atmospheric Ammonia with MicroPuran® (see MicroPuranSummary)

MicroPuran® is a blend of bacteria and enzymes selected to reduce ammonia when applied to litter in poultry houses or manure in animal facilities. Research by Faltys and Whaley, 2005, showed that the level of ammonia in broiler houses could be maintained below 25ppm for 52 days when the litter was treated with MicroPuran®. Oyler and Gulbransen, 2006, reported similar results in broilers placed on litter for 38 days after treatment with MicroPuran®.

Levels of ammonia in broiler houses were measured from early spring through fall in six houses treated with MicroPuran® (Faltys, et.al., 2007). Ammonia levels were high (approx. 200ppm) immediately after application of MicroPuran® and decreased to levels below 60ppm in the first 7 days after bird arrival and remained below 25ppm throughout the grow-out period.

MicroPuran® has also been used to control ammonia in turkey barns. Oyler, 2006, reported that MicroPuran® kept ammonia levels below 25ppm for 147 days. Application of MicroPuran® to a turkey brooder caused ammonia to decrease below 32ppm by day 10 post application (Faltys et.al. 2007).

Application of MicroPuran® to manure in MVS cattle confinement barns reduced atmospheric ammonia compared to untreated manure within 3 days after application. Further reductions in ammonia were observed within 10 days after application compared to controls.

The implication of the research is that atmospheric ammonia can be reduced throughout the growing period by adding MicroPuran® to litter and manure. This procedure is non-caustic and may be beneficial to the health and performance of the birds and animals.

Improving Manure Quality with MicroPuran®

Application of MicroPuran® to swine manure reduced crusting in manure pits and increased total and organic nitrogen in the manure. Organic nitrogen and total nitrogen of cattle manure from bed-pack barns was increased by 4% and 3.8%, respectively, following application of MicroPuran® compared to manure that was not treated.

The implications of the research are that MicroPuran® will increase the quality and value of manure. Application of MicroPuran® offers the livestock producer the opportunity to compost waste material and to sell the composted waste.

Literature Cited

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