

Dairy Research Supported by the Ohio Dairy Research Fund since 2004 (partial list)

Nutrition

Assessing Biotin Status of Lactating Cows. Although we were not successful in identifying a measure of biotin status in lactating cows that could be used to determine when cows are likely to respond to supplemental biotin, the supplemental biotin increased milk yield by about 6 lb/day in high producing cows but had no effect on milk yield of low producing cows. (*Dr. William Weiss*)

Supplemental Rumen-Protected Choline and Methionine for Lactating Dairy Cows. The primary purposes of these experiments were to establish the magnitude of protection of three commercially available, rumen protected choline (RPC) sources [Reashure[®], Balchem Encapsulates, New Hampton, NY; By Pass Choline (BPC), Robt Morgan, Inc., Paris, IL; and Pro-Choline[™] 40, Probiotech, Inc., St-Eustache, QC, Canada] and to determine the effects of feeding supplemental rumen-protected choline and rumen protected methionine (Smartamine M[™], Adisseo, Antony Cedex, France). Conclusions: 1) Reashure was more rumen stable than the other two choline sources, 2) milk choline is a better indicator of choline status than plasma choline, and 3) feeding rumen protected methionine to the periparturient dairy cow may be beneficial for reducing risks of metabolic diseases and improving animal performance related to choline status. (*Dr. Maurice Eastridge*)

Animal Health

Survey of Bovine Practitioners to Determine the Prevalence of and Factors Associated with Acute Bloat Syndrome in Pre-Weaned Dairy Heifers. Acute Bloat Syndrome (ABS) was identified by 276 veterinarians across the country on a median of four farms per practitioner. Common symptoms included abdominal distension, fluid slosh in the abdomen, colic, and dehydration. Symptoms did not commonly include either diarrhea or an elevated temperature. The majority of cases were seen in calves 4 to 21 days old. In calves exhibiting clinical symptoms, some combination of antibiotics, rumen tonics, anti-inflammatories, and bloat-relieving measures may be effective in some cases. The majority of possible preventive therapies focused around the diet and feeding program. However, no particular diet or feeding strategy in place on any of the case farms precluded a case of ABS from occurring. While isolation of Clostridia spp. from clinical cases in no way proves that Clostridia spp. are the causative agents of ABS, the frequency with which these organisms were isolated deserves to be noted. Sarcinia spp. were the second most common bacterial isolate. (*Ms. Dianne Shoemaker*)

Forages and Manure Utilization

Occurrence and Control of the Fescue and Ryegrass Toxicosis Endophytes in Ohio Dairy Pastures. Eleven percent of the ryegrass pastures sampled in 2003 had high (> 40%) incidence of endophyte infection. Those pastures with moderate levels of endophyte (5-40% endophyte infection) are also cause for concern, with 24% of the ryegrass pastures sampled falling into this category. Of the fescue fields tested, 3 (18%) had moderate infection and 8 (47%) had high infection. For those fields re-sampled in 2004, levels of endophyte were similar to those found in 2003. The factor most consistent with high endophyte levels in ryegrass and tall fescue was greater seed of unknown origin. None of the 10 fungicide treatments reduced endophyte levels. The unsprayed control plots had 47.5% incidence of endophyte. Since plots received four applications of each fungicide and the maximum label rate of each fungicide was used each time, it appears unlikely that fungicide eradication of endophytes in established pastures will be successful. However, neither the antibody method nor the staining method used to assess endophyte levels in plant tissue are capable of discriminating between living and dead endophyte. Fungicides may have killed some of the endophyte within the grass plants, but these samples would appear identical to samples with live endophyte. (*Dr. Landon Rhodes*)

Capturing and Recycling Dairy Nitrogen Manure Nutrients with Winter Cover Crops. Using 9 livestock farms, the winter cover crops (WCC) included annual ryegrass (ARG), cereal rye (CR), and oilseed radish (OSR) compared to bare land. Each treatment had 3 rates (0, 6,000, and 12,000 gallons) of dairy liquid manure applied. The WCC are great scavengers of excess nitrogen (up to 500 lb/acre) and phosphorus (60 lb/acre). The OSR and ARG absorbed more nitrogen than CR, and more soil nitrate nitrogen and soil total nitrogen were available for the next crop. Carbon and the carbon-nitrogen ratio were higher for CR. Grass WCC such as annual ryegrass (ARG) and cereal rye (CR) have the potential to be utilized by livestock farmers to absorb manure nutrients and prevent manure winter runoff. The nitrogen in dairy manure can be recycled to the next crop if the WCC are killed in early April and the cover crops have time to decay and release nutrients back into the soil. Annual grass WCC are preferred to other cover crops (oil seed radish) because they provide the additional benefit of protecting the soil during the winter months from soil erosion. (*Mr. James Hoorman*)

Determining Annual Trend of H₂S and Odor Levels at Dairy Manure Storage Ponds and Downwind Property Line for Effective and Economic Air Quality Management. Large seasonal variations in ammonia (NH₃), hydrogen sulfide (H₂S), and odor levels occurred at the dairy manure storage pond. Warmer months, such as May to August, were associated with high levels of NH₃ and odor. The H₂S levels varied without a trend. During the 8-month study period, the overall gas and odor levels at the manure storage pond were generally not high enough to cause air quality concerns. The NH₃ levels varied from 1.2 to 7.4 ppm; H₂S 2 to 72 ppb (parts per billion); and odor level 96 to 381 OU/m³. Since odor is a subjective perception of an individual, it is difficult to say exactly what odor level is odor free and what level is very offensive. However, hot months generally had relative high odor levels. If odor is a concern to neighbors and limited mitigation can be afforded, then warmer months are the critical time for odor abatement practices. The H₂S dispersed well during noon sampling periods, and the dairy facility did not affect the ambient H₂S level at the 1000 ft downwind to neighboring areas. The NH₃ emission from the 650 to 700 cow operation was likely more than 100 lb/day in warmer months. (*Dr. Lingying Zhao*)

Manure Handling, Storage, and Recycling on Ohio Grade-A Dairy Farms. In 2003, a voluntary mail survey was sent to Ohio Grade-A dairy farms in an attempt to characterize the manure handling, storage, and recycling practices of these operations and gauge their general knowledge and attitude toward water quality and the environment. Twenty-four percent of Ohio's 2,760 Grade-A dairy farms responded; operating 197 to 2,483 acres of crop land and have an average of 1.6 to 4.0 acres for each cow. Sand was the primary bedding source on at least 21% of the farms. Less than 17% of Ohio's Grade-A farms do not have any manure storage. Of those with storage, over 40% have both liquid and solid manure storage. Manure was hauled greater distances and applied on more acres as farm size increased, and the number of acres per cow decreased as farm size increased, increasing the estimated nutrient application levels on a per acre basis. (*Mr. Jon Rausch*)