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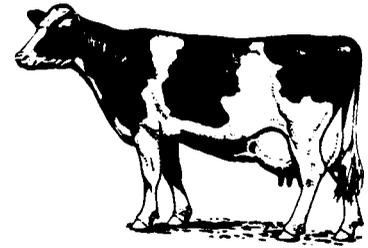
UNIVERSITY OF MINNESOTA

College of Veterinary Medicine

VETERINARY CONTINUING EDUCATION



ST. PAUL, MINNESOTA
UNITED STATES OF MINNESOTA



Dairy Update

Dairy Animal Waste Management Systems

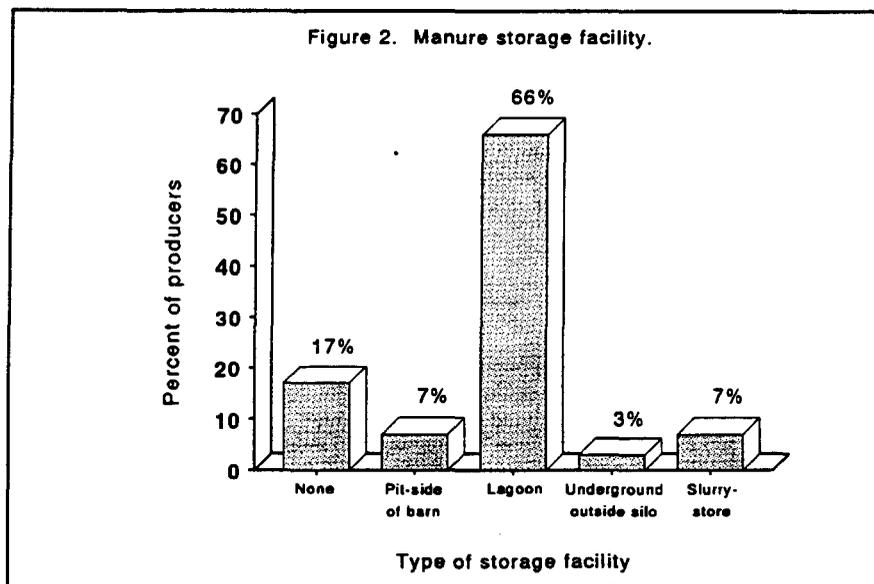
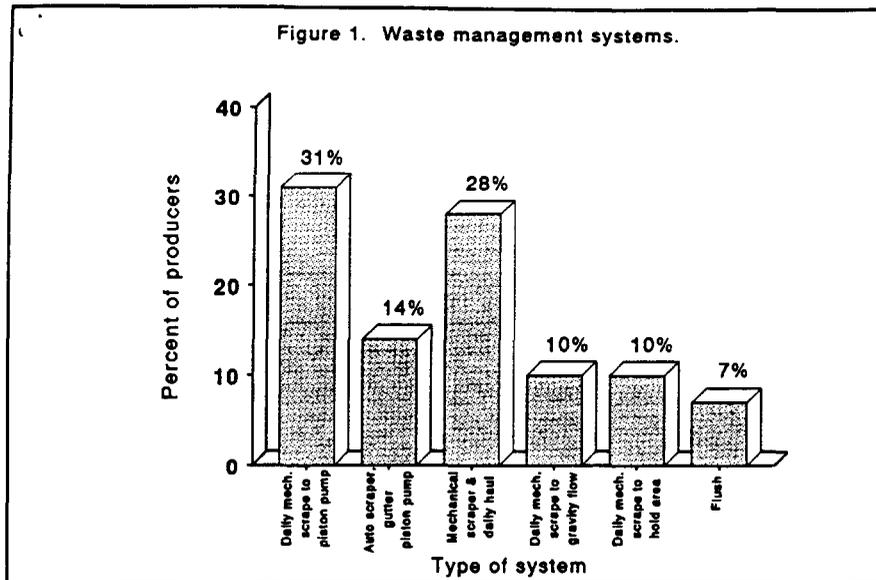
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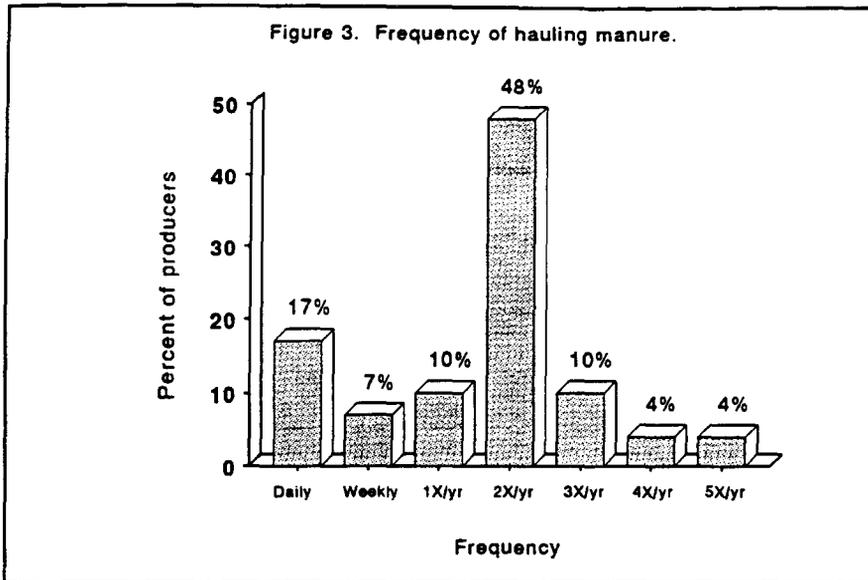
Animal waste management systems were studied on 29 dairy herds (130-1,010 cows) in Michigan and Wisconsin utilizing a survey to look at ways to clean cow traffic alleys, method of manure storage, method of moving manure to field site, along with manure application rates and manure testing.

No one animal waste management system dominates the 29 large dairy herds surveyed; however, daily scrape and haul, and daily mechanical scrape with a piston or forced air system to the manure storage area were most popular. No flush systems were reported in the large herds surveyed in Michigan; however, two large herds in Wisconsin reported flush systems and were pleased with their performance. Producers utilizing sand most often used a daily scrape and haul system. A number of farms surveyed were utilizing automatic mechanical scrapers with a barn cleaner chain and piston pump. Concerns surfaced on piston pump life and performance. Automatic mechanical alley scrapers appeared to be returning in Michigan. Temperatures have been relatively moderate in recent winter months. It would be interesting to monitor their performance in the 1993-94 winter months where temperatures have been on the low side. Cow cleanliness (especially feet and legs) was evident in herds using mechanical alley scraper systems. Traffic alleys in these setups were dry and clean. Figure 1 shows the different types of waste management systems on large dairy farms in Michigan and Wisconsin.

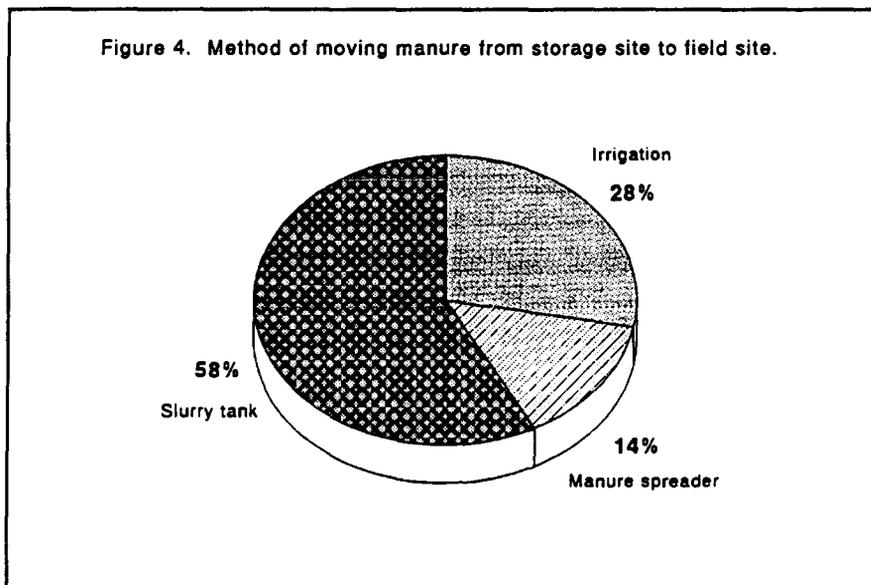
Manure storage facilities were studied in the survey. Again, systems were broad and varied in design. Earthen lagoon was the most popular animal waste management storage system in large herds in Michigan and Wisconsin. They were reported on 66% of dairy farms surveyed. Two farms surveyed were in the process of building an earthen lagoon for manure storage. One of these producers was utilizing sand in his free stalls and planned to construct his lagoon with a cement bottom and sides, and a ramp so he could conveniently haul out sand. Note that 17% of producers surveyed reported no manure storage facility. Often, these farms were using sand for bedding in free stalls and have a daily scrape and haul system. Figure 2 show the types of manure storage facilities.



The question of frequency of hauling manure was addressed in the survey. Again, a wide spectrum of responses was provided; however, hauling manure twice per year was reported in 48% of herds surveyed. Application periods were in the spring prior to planting and in the fall following harvest of corn silage, corn or soybeans. Figure 3 shows frequency of hauling manure.

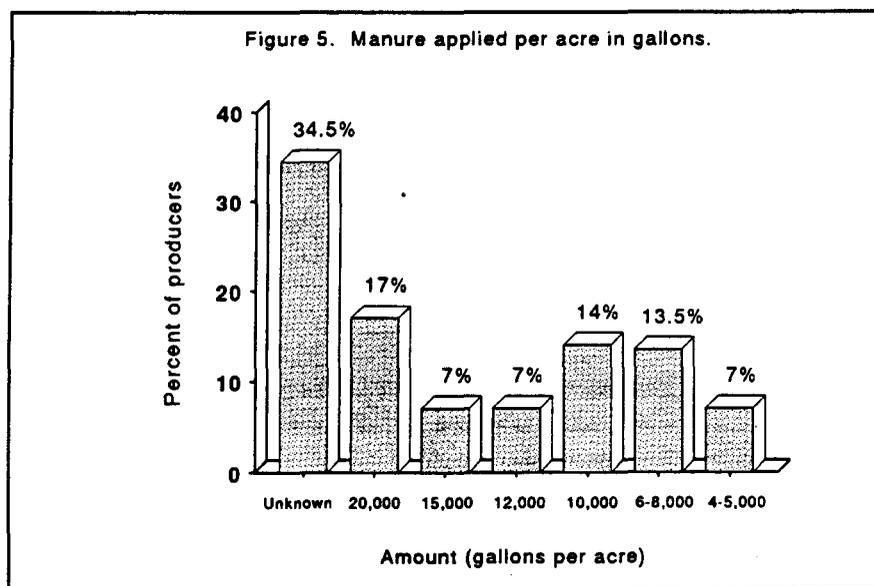


The question of moving manure to a field site was also asked. Slurry tanks were reported as the vehicle to transport manure on 58% of the farms while irrigation systems were reported on 28% of the farms. In Michigan, farms utilizing irrigation systems most often owned and operated their own system while in Wisconsin, custom irrigation operators were hired to agitate manure and apply on fields. Frequently, manure was applied on top of the ground with no injection or incorporation at application time. Figure 4 summarizes methods of moving manure from storage area to the field site.



The question of analyzing manure was included in the survey. Fifty-two percent reported analyzing manure for nutrient content while 48% replied no to analyzing manure. A question addressing the amount of manure applied per acre was included in the survey study. It was evident that amounts are very widespread and uncertain by those producers surveyed. Thirty-four percent reported "unknown" when asked about the amount of manure applied.

With increasing concern of animal waste contamination in the environment, especially above and below ground water, this area will continue to receive more attention to maintain lakes, streams and rivers that are fishable and swimmable. Variability of application runs from 4,000 to 20,000 gallons per acre with 41% of responses running from 10,000 to 20,000 gallons per acre and 21% applying 4,000 to 8,000 gallons of manure per acre. This is an area where additional education needs to be done. Soil nutrient levels must be monitored more frequently and manure applied in amounts to meet plant growth needs. Phosphorous levels on soils were discussed with some farm owners but knowledge base of amount on soil test and tolerable level is not well understood by owners surveyed. Figure 5 shows amounts of manure applied per acre on farms surveyed where data was available.



Finally, the question of keeping manure application records was studied. Eighty-six percent of the 29 large farm owners surveyed reported keeping manure application records. Again, concerns surfaced after experiencing their lack of accurate amounts applied per acre.