

Manure and Runoff Collection

Jessica Davis, Environmental Soil Scientist, CSU

When collecting manure and runoff from the milking parlor and corrals, there are several goals to keep in mind. We aim to keep the cows and ourselves healthy, protect the environment (both surface water and groundwater quality), and minimize flies, odor, and dust. Frequent removal of manure reduces odors, controls fly larvae, and minimizes the potential for surface and groundwater contamination. Some dairies harrow their pens daily with good results in both environmental and animal health benefits. Maintaining a firm, dry corral surface is an important factor in good animal health and a healthy environment. One should strive to keep the loose manure layer less than one inch deep and pen moisture between 25-35%. Too much moisture will increase odor and fly problems; too little moisture will promote difficulties with dust.

Methods of manure removal vary. Two of the most common methods are the wheeled front-end loader and the box scraper. Both are effective. However, the box scraper or other scraping device, such as a paddle scraper or road grader, are more effective at two things: 1) providing a smooth pen surface that facilitates proper drainage, and 2) maintaining the integrity of the compacted protective seal or "hard pan" under corrals. A wheeled front-end loader requires an experienced operator. For each bucket of manure accumulated with a loader, the operator must shift gears four times while manipulating the bucket. This is most likely to result in an irregular corral surface at best or damage to the protective "hard pan." A combination of a wheeled front-end loader for major manure removal and a scraper for final cleaning and grading is an effective compromise.

Pens designed so that there is good drainage (minimum of 3% slope from apron to back of pen) will help ensure that excess moisture can be managed. The primary goals of runoff management are to divert water from flowing across the corrals and storage areas and to prevent direct runoff from the corrals or the stockpiled manure into waterways. Runoff can be diverted by digging ditches and building berms. One of the primary principles of runoff management is to "keep clean water clean." In other words, direct clean water away from manure, whether that manure is already stockpiled or still in the corral. All wastewater and stormwater runoff from pens must be collected and stored (up to a 25-year 24-hour storm). Animals should be fenced out of watercourses to eliminate direct deposition of manure into water.

The insert for this issue describes two procedures to help you manage manure and runoff collection on your dairy. The evaluation procedure consists of a series of questions to evaluate the manure and runoff collection practices on your dairy. The SOP (standard operating procedures) on manure and runoff collection suggests a routine of activities that should be followed to manage manure and runoff collection. This SOP will need to be tailored to the dairy but serves as an organizational outline of important aspects of this facet of dairy management.