6.0 OUTDOOR AREAS FOR DAIRY AND BEEF

Pasture Areas

Pastures are locations where livestock are primarily sustained by consuming feed growing on the area. Cattle densities in these areas are normally low, manure is therefore dispersed and available as a crop fertilizer without any further spreading.

Proper grazing of pastures can be compatible with riparian systems. Riparian areas, sometimes called shorelands, are the transition zones between land and water that line ponds, rivers, lakes, streams and marshes. (See 7.3 Riparian Areas). Grazing strategies need to be site-specific and must be developed to fit the location and the producer's operation.

Consider the following points in watering dairy and beef cattle on pasture:

- cattle may have access to natural water sources provided manure does not cause pollution and productive riparian areas are sustained;
- development of natural watering sites will ensure cattle have access to good water while limiting pollution concerns;
- whenever possible, use waterers setback from the watercourse and located to limit pollution concerns; and,
- place salt blocks and mineral licks so as to discourage loitering at watering sites and at a minimum distance of 100 metres (300 ft).

Confined Livestock Areas/Feedlots

Confined dairy areas can include outdoor, non-grazing sites where livestock are confined by fences, other structures or topography. Confined beef areas include facilities where cattle are partially or totally confined indoors, or are confined in outdoor, non-grazing sites by fences, other structures or topography. The terms commonly used are feedlots, paddocks, corrals, exercise yards, pens and holding areas. This practice is more common in the other areas of Canada than in Newfoundland and Labrador. In these other areas, livestock densities are 100 m^2 (1,000 ft^2) or less per mature animal. This is equal to 100 or more animals per hectare (40 or more animals per acre). A typical dairy operation would utilize confined livestock areas for wintering heifers and dry cows and for feeding out steers.

Please note that while this section mainly deals with cattle, these same guidelines apply for other livestock such as hogs.

Confined livestock areas require routine cleaning with all manure being spread on cropland for fertilizer. Manure stored in these areas must be managed in a manner that will not cause pollution of surface or groundwater.

6.1 SITE SELECTION

When choosing a site for a confined livestock area, you must consider the following.

- avoid sites with porous soils and/or fractured rock that would allow direct access of any contaminants to the groundwater;

- maintain recommended property separation distances as per Section 3, Site Selection. A minimum separation distance of 50 metres (160 ft) is required from any watercourse; and,

- provide adequate lot slopes and feed alley orientation to take advantage of sunlight, and use recommended stocking densities to enhance drying of the lot surface.

6.2 MANURE MANAGEMENT FOR CONFINED LIVESTOCK AREAS

Most confined livestock facilities use solid manure storage systems.

Solid Systems

Solid manure, a non-flowing material, results when the liquid portion is drained off and the manure dries, or the addition of bedding material absorbs the liquid.

(a) Bedding Packs

Many confined livestock operations in other provinces use a bedding pack. These bedding packs are often formed into mounds in pens where there is little or no slope. For well-bedded mounds, much of the liquid is absorbed, resulting in minimal seepage. Regardless of the amount of bedding, however, runoff from confined livestock areas must be contained on the operator's property. (See 6.3, Runoff Control).

A thorough cleaning once a year is recommended if a bedding pack is utilized. Thorough cleaning means the removal of manure down to the parent soil layer. Over cleaning will tend to remove the compacted and impervious soil interface layer and increase the possibility of downward nutrient movement. Cattle feedlot operators in other provinces often leave approximately 10% of the bedding pack during cleaning to retain a mound.

Manure can also be scraped from a concrete apron along the feed bunk with a front end loader. A concrete bucking wall is used to help stockpile the solid manure adjacent to a liquid holding pond. The stockpiled manure is then removed for land application.

(b) Concrete (or Hard Surfaced) Yards

Dairy cattle can also be housed in a yard area where they are fed or exercised. If less than 37 m^2 (400 ft^2) of space is provided per animal, the entire yard

should be hard surfaced.

When using concrete yards you must consider the following guidelines:

- the size of the yard area should be kept to a minimum to reduce the amount of precipitation that can mix with the manure, and to reduce the labour needed to keep the area clean;
- clean water from roofs and from the surrounding area should be diverted away from the open yard so as not to mix with contaminated water within the yard;
- runoff from the yard should be contained in a suitable holding tank, or directed to the manure storage facility; and,
- the open yard area should be cleaned regularly by scraping the manure to an appropriate storage structure suitable for either semi-solid or liquid manure, depending on the system in use on the farm. Under no conditions should cows be permitted to stand around in an area where excess manure is allowed to accumulate.

Liquid Systems

Liquid manure systems for beef operations in Canada are uncommon because of the associated high costs of the systems compared to other alternatives. However, there are dairy farms in the province which use liquid systems.

Liquid systems typically use a slatted floor barn with no bedding. Liquid manure can be stored up to six months below the slats. However, because of potentially toxic gas problems and the high cost of construction, some type of system (pumps, scrapers, etc.) is suggested to remove the manure from shallow pits below the slats to an alternate storage, such as an earthen storage or an aboveground tank.

6.3 RUNOFF CONTROL FOR CONFINED LIVESTOCK AREAS

Runoff control cannot be over emphasized in confined livestock area layout and management. The following discussion also relates to seasonal feeding areas that pose a risk to surface water.
Both off-site and on-site runoff must be controlled to make the area environmentally sound. You can help to control runoff by considering the following in your design of the area:

- create diversion ditches or dikes to direct clean off-site water away from the site;
- grade the pens to allow on-site contaminated runoff to be collected in an impervious containment basin; and,
- plant grass filter strips where appropriate.

(a) Diversion Ditches/Berms

Because on-site runoff must be stored in a suitable basin, every effort to reduce the volume of off-site runoff coming onto the site will reduce the basin size and cost. All off-site runoff should, therefore, be directed away from the confined livestock area by perimeter ditches or berms. This will also keep pens drier.

(b) Grading for Runoff Control

The on-site runoff will be easy to control and will benefit cattle performance if the pens are graded during construction. A 2% to 4% diagonal slope across the pens toward the collection basin is recommended. Bedded mounds should run parallel to this diagonal slope to prevent run-off from ponding in the pens.

Runoff from a confined livestock area is directed to a collection basin, ensuring no contamination of surface water occurs. Shallow basins with large surface areas allow greater evaporation, require little maintenance and may be cropped. If a deep holding pond is necessary, the liquid can be pumped onto adjacent cropland. Collection basins should be emptied as soon as possible after major rain storms and/or spring runoff. A liner of clay or other suitable impervious material is required in porous soils and over fractured rock aquifers.

Larger feedlots often incorporate a two staged collection system consisting of a shallow settling basin and a deeper holding basin. Runoff is directed to the settling basin where the liquid portion is drained off by means of a debris fence. The liquid overflow trickles through this fence, which consists of a trash screen or narrow vertical slots, into the main holding basin.

After drying, the solids are scraped from the settling basin and spread onto cropland as fertilizer.

The storage volume of the collection basin (for rainfall and snowmelt) should be designed to hold 75 mm (3 inches) of precipitation from the collection area. If all off-site runoff is diverted away, the collection area will consist solely of the confined livestock area. Construct the basin 300 mm (1 ft) higher than the design elevation for reserve capacity.

The settling basin is not always installed but is recommended. When used, it should have a surface area about 2.5% of the collection area. The depth should be 60 to 120 cm (2 to 4 ft).

(c) Vegetative Buffers

Where there is sufficient land, suitable soil conditions and topography, a grassed

filter strip or vegetative buffer may provide sufficient infiltration to eliminate runoff and may be used as an alternative to a collection basin. A grassed strip should be at least 10 metres (30 ft) wide to be effective. Reed canary grass or orchard grass provide very effective vegetative buffers.

Please note, a vegetative buffer may not be suitable in sensitive groundwater areas (see Section 5.4, Sensitive Groundwater Areas).