

## Unit Eleven Appendix

### Minimum Design Volume of Anaerobic Storage Lagoon

Animal	Volume per lb. of animal (cubic feet)	Lb. Volume per animal (cubic feet)
Poultry	3	12 (4-lb. chicken)
Hog	2	400 (200-lb. hog)
Beef	2	2000 (1,000-lb. animal)
Dairy	2	2800 (1,400-lb. cow)

**Appendix A**

### Aerated Lagoon Design Values

Animal	Volume per lb. of livestock animal (cubic feet)	Volume per Animal (cubic feet)	Aerator size* (head per horsepower)
Poultry (4-lb. chicken)	0.75	3	2290
Hog (200-lb. hog)	1.00	200	75
Beef (1,000-lb. animal)	0.75	750	20
Dairy (1,400-lb. cow)	1.25	1750	14

\* The aerator size is based on an oxygen transfer rate to the lagoon water of 2 pounds per horsepower-hour and provides oxygen at a rate of 1.5 times the biochemical oxygen demand. For maximum mixing and oxygen dispersion, the aerator can be sized to give 1 horsepower per 1,000 square feet of lagoon water surface.

**Appendix B**

<b>Animal</b>	<b>Size (lb.)</b>	<b>Total manure production (cubic feet per day)</b>
Dairy cattle	1400	2.0
Beef cattle	750	0.8
Hogs	150	0.2
Laying hens	4	0.004
Broilers	2	0.0028

Manure production. (Values are approximate and in practice easily vary 20 percent above or below table values. Includes wasted water, and for dairy cows, water from cleaning milking center and equipment).

**Appendix C**

- ♦ Air Contaminants (Occupational and Safety Health Act)
- ♦ Regulated Toxic, Explosive, or Flammable Substances (Clean Air Act)
- ♦ Criteria Air Pollutants (Clean Air Act)
- ♦ Extremely Hazardous Substances (Superfund)
- ♦ Hazardous Air Pollutants (Clean Air Act)
- ♦ Hazardous Constituents (Resource Conservation and Recovery Act)
- ♦ Hazardous Substances (Superfund)
- ♦ Inhalation of Hazardous Chemicals (Department of Transportation)
- ♦ Maximum Contaminant Levels (Safe Drinking Water Act)
- ♦ Registered Pesticides (Federal Insecticide, Fungicide, and Rodenticide Act)
- ♦ Priority Pollutants (Clean Water Act)
- ♦ Toxic Release Inventory Chemicals (1999 Reporting Year)
- ♦ Toxic Release Inventory Chemicals

Some important federal regulations and legislation governing waste management on farms. Additional state regulations might apply.

#### **Appendix D**

### **Measurement of waste load (Definitions)**

Waste load can be determined by a number of different measurements, including the biochemical oxygen demand (BOD); the chemical oxygen demand (COD); dissolved oxygen (DO); the total suspended solids concentration (TSS); the total Kjeldahl nitrogen content (TKN); the concentration of fats; oils, and grease (FOG); bacterial counts (*Clostridium perfringens*, *E. coli*); and a-chlorophyll.