

WSDA estimate of nitrogen emissions from confined animal feeding operation (CAFO) dairies.

Available at <https://www.yakimacounty.us/DocumentCenter/View/22177/GWMA-VolumeI-July2019> page 25

The national statistical average of manure production of milk cows (in 2000) was 15.24 tons per animal unit of manure excreted per year. The national statistical average of nitrogen per ton of manure excreted is 10.69 pounds of nitrogen per ton (Kellogg et al. 2000). The formulas used by the Washington State Department of Agriculture (2010) to calculate animal manure production, nitrogen production, and losses due to volatilization or denitrification for Holstein cows are as follows:

- **Annual manure production** is calculated using the following formula:

$$[[(\text{number of milking cows}) (1.4) (108)] + [(\text{number of dry cows}) (1.4) (51)] + [(\text{number of heifers}) (0.97) (56)] + [(\text{number of calves}) (0.33) (83)]] (365)/2000$$

- **Nitrogen production** is calculated using the following formula:

$$[[(\text{number of milking cows}) (1.4) (0.71)] + [(\text{number of dry cows}) (1.4) (0.3)] + [(\text{number of heifers}) (0.97) (0.27)] + [(\text{number of calves}) (0.33) (0.42)]] (365)/2000$$

- **Losses due to volatilization** during storage are estimated at 35 percent. This does not include application losses.