



Agronomy Facts 54

# Pennsylvania's Nutrient Management Act (Act 38): Who Is Affected?

In spring 1993, the Pennsylvania legislature passed and the governor signed the Nutrient Management Act (Act 6) into law. The regulations implementing this law went into effect in 1997. In 2002 the State Conservation Commission began an effort to revise these regulations. In summer 2005, the Pennsylvania legislature replaced Act 6 with Act 38 as part of the Agriculture, Communities, and Rural Environment (ACRE) initiative. The new regulations, now falling under the new Act 38, were finalized in 2006 and went into effect in October of that year.

These revised regulations include several significant changes in the state's nutrient management program, including changes to who is affected by the regulations. This fact sheet addresses the question "Who is affected (regulated) by this legislation and regulations?"

## CONCENTRATED ANIMAL OPERATIONS

The act states that "concentrated animal operations" will be required to develop and maintain a nutrient management plan. Concentrated animal operations (CAOs) are defined as agricultural operations where the animal density of all livestock on the farm exceeds 2 animal equivalent units (AEUs) per acre on an annualized basis. This animal density criteria has not changed in the new regulations; however, two significant changes were made. First, the definition now includes all livestock, including nonproduction animals such as horses used for recreation and transportation. Second, an operation with less than 8 AEUs is not considered to be a CAO regardless of the animal density.

## Animal Equivalent Units (AEU)

An AEU is 1,000 pounds of live weight of any animal on an annualized basis. Annualized means that if animals are not present on an operation for a whole year, the animal units are adjusted for the proportion of time during the year that animals are present on the operation. The calculation involves determining the number of AEUs of all animals on the farm based on the number of animals and their average weights and then adjusting that for the actual number of days (out of 365) that the animals are on the operation. To determine the number of AEUs on a farm, the following

formula can be used for each type of animal and then added together to get the total AEUs on the farm:

$$\text{AEUs for each type of animal} = [\text{average number of animals on a typical day that the animals are there} \times \text{animal weight (lb)} \div 1,000] \times [\text{number of days the animals are on the operation per year} \div 365]$$

Table 1 (page 3) lists standard animal weights that are used to calculate AEUs. It is strongly suggested that these standard animal weights be used for this calculation. However, if the farmer has records of actual weights of the animals on the farm, these may be used to determine the appropriate animal weight to be used for this calculation if the records are complete enough to justify the use of the nonstandard weights. Note that for growing animals, an average weight for their growth over the year is used. For example, for broilers that grow from 0.09 to 5.9 pounds per animal over the growth cycle, the average weight would calculate to be 3.0 pounds per animal.

## Acres Suitable for Application of Manure

The acreage number used in the animal density calculation is all acres, owned and rented, that are suitable for the application of manure. This acreage is determined to be those lands that meet the following criteria:

- cropland, hay land, or pastureland (owned or rented) that is an integral part of the operation
- land that is under the management control of the operator
- land that is or will be used for the application of manure from the operation

Farmstead and forestland cannot be included in this calculation as land suitable for manure application.

## Animal Density

The number of acres that meet the criteria listed above are then divided into the total AEUs on the farm to determine the overall animal density for the operation. Use the blank worksheet on page 4 to calculate the animal density on your farm.

### Concentrated Animal Operations Requirements

A CAO as defined under the original regulations that was in existence on the effective date of the revised regulation (October 1, 2006) should already have an approved nutrient management plan. The following are the new plan submission requirements of CAOs as defined in the revised regulations:

- An existing operation that becomes a CAO due to the changes in the regulations listed above must have submitted a nutrient management plan for approval by October 1, 2008.
- A new CAO that comes into existence after the effective date must have an approved plan prior to the commencement of manure operations.
- An agricultural operation that is planning an expansion that will result in that operation becoming a CAO must have an approved plan prior to the expansion.
- An agricultural operation that because of loss of land suitable for manure application now meets the criteria for a CAO must submit a nutrient management plan within six months after the date of the loss of land.

### EXAMPLE CAO CALCULATIONS

The following is an example of an AEU per acre calculation.

#### Example Farm Data

<b>Animal Inventory</b> (Average weights taken from Table 1)	110 dairy cows @ 1,300-lb average weight each 35 heifers @ 900-lb average weight each 20 calves @ 375-lb average weight each 15,000 heavy broilers @ 3-lb average weight each
<b>Production Period</b>	Cows = 365 days per year Broilers = 5 flocks for 57 days each, or 285 days per year
<b>Land Inventory</b>	Farmstead = 5 acres Woodland = 3 acres Pasture = 4 acres Cropland, home farm = 60 acres Cropland, rented farm = 36 acres

This example farm would be defined as a CAO and would be required to develop and implement an approved nutrient management plan. The animal density criterion is not to be construed as prohibiting development or expansion of agricultural operations that would exceed the criterion. It simply means that these operations will be required to have an approved nutrient management plan. Farms with an animal density higher than 2 AEU per acre are likely to have more nutrients than can be fully used by the crops grown on the farm. Thus, nutrient management plans for CAOs often will describe on-farm manure utilization, as well as procedures for moving some manure off the farm.

### OTHER REQUIRED PLANS

Farms receiving financial assistance for nutrient management, such as from the Chesapeake Bay Program, are also required to have a nutrient management plan. Any farm that violates the Clean Streams Law also may be required to develop a nutrient management plan.

### VOLUNTARY PLANS

Farms with fewer than 2 AEU per acre and farms with fewer than a total of 8 AEU on the operation are encouraged to voluntarily develop nutrient management plans. Nutrient management plans, whether required or voluntary, can improve farm profits, help protect the environment, provide some protection from liability, and enhance the image with the general public of agriculture as a good steward of our natural resources.

### FOR MORE INFORMATION

For more information, contact your local Penn State Cooperative Extension office or your local conservation district. For a summary of the Nutrient Management Act and regulations, see Penn State's *Agronomy Facts 40: Nutrient Management Legislation in Pennsylvania: A Summary of the 2006 Regulations*, which is available from your local Penn State Cooperative Extension office.

Using this example data and the worksheet, the calculation of animal density (AEUs per acre) for this farm would be as follows:

ANIMAL TYPE	NO. ANIMALS	X ANIMAL WEIGHT (LBS)	X PROD. DAYS	÷ FACTOR =	AEU
Dairy	110	x 1,300	x 365	÷ 365,000 =	143.0
Heifers	35	x 900	x 365	÷ 365,000 =	31.5
Calves	20	x 375	x 365	÷ 365,000 =	7.5
Broilers	15,000	x 3	x 285	÷ 365,000 =	35.14
		x	x	÷ 365,000 =	
		x	x	÷ 365,000 =	
		x	x	÷ 365,000 =	
				Total* =	217.14
				Acres available for manure**	÷ 100
				AEUs/acre	= 2.17

\*If this figure is less than 8, then the farm would not be a CAO, regardless of the AEU/acre figure calculated below.

\*\*Includes only cropland, hayland, and pastures; for this example there are 96 acres of cropland/hayland and 4 acres of pasture.

**Table 1. Standard animal weights used to calculate animal equivalent units to identify concentrated animal operations.**

TYPE OF ANIMAL	STANDARD WEIGHT (LBS) DURING PRODUCTION (RANGE)	TYPE OF ANIMAL	STANDARD WEIGHT (LBS) DURING PRODUCTION (RANGE)
<b>Dairy</b>		<b>Smaller Breed Sheep</b>	
<i>Holstein/Brown Swiss</i>		Lamb: 0–1 yr.	50 (10–90)
Cow	1,300	Ewe	150
Heifer: 1–2 yr.	900 (650–1,150)	Ram	185
Calf: 0–1 yr.	375 (100–650)	<b>Meat Goats</b>	
Bull	1,500	Kid: 0–1 yr.	65 (5–125)
<i>Ayrshire/Guernsey</i>		Doe	150
Cow	1,100	Buck	200
Heifer: 1–2 yr.	800 (575–1,025)	<b>Dairy Goats</b>	
Calf: 0–1 yr.	338 (100–575)	Kid: 0–1 yr.	45 (5–85)
Bull	1,250	Doe	125
<i>Jersey</i>		Buck	170
Cow	900	<b>Miniature Horses and Miniature Donkeys</b>	
Heifer: 1–2 yr.	600 (400–800)	Foal: 0–6 mo.	35 (25–45)
Calf: 0–1 yr.	225 (50–400)	Weanling: 6–12 mo.	60 (45–75)
Bull	1,000	Yearling: 12–24 mo.	100 (75–125)
<b>Swine</b>		Two-Year-Old: 24–36 mo.	150 (125–175)
Nursery pig	30 (15–45)	Mature	200
Wean to finish	140 (15–265)	<b>Ponies and Donkeys</b>	
Grow finish	155 (45–265)	Foal: 0–6 mo.	65 (30–100)
Gestating sow	400	Weanling: 6–12 mo.	150 (100–200)
Sow and litter	470	Yearling: 12–24 mo.	300 (200–400)
Boar	450	Two-Year-Old: 24–36 mo.	400 (300–500)
<b>Poultry</b>		Mature	600
Layer: 18–65 wk.	3.10 (2.75–3.45)	<b>Light Horses and Mules</b>	
Layer: 18–105 wk.	3.15 weighted avg.	Foal: 0–6 mo.	190 (80–300)
Layer, brown egg: 20–65 wk.	3.8 (3.3–4.3)	Weanling: 6–12 mo.	450 (300–600)
Layer, brown egg: 20–105 wk.	4.00 (3.3–4.7)	Yearling: 12–24 mo.	700 (600–800)
Pullet: 0–18 wk.	1.42 (0.08–2.75)	Two Year Old: 24–36 mo.	900 (800–1,000)
Broiler, large: 0–53 days	3.0 (0.09–6.0)	Mature	1,100
Broiler, medium: 0–35 days	2.3 (0.090–4.5)	<b>Draft Horses</b>	
Roaster	3.54 (0.09–7)	Foal: 0–6 mo.	360 (120–600)
Male: 0–7 wk.		Weanling: 6–12 mo.	800 (600–1,000)
Female: 0–9 wk.		Yearling: 12–24 mo.	1150 (1,000–1,300)
Turkey, tom: 0–18 wk.	20.0 (0.12–40)	Two-Year-Old: 24–36 mo.	1450 (1,300–1,600)
Turkey, hen: 0–12 wk.	7.1 (0.12–14)	Mature	1,800
Duck: 0–43 days	3.56 (0.11–7)	<b>Bison</b>	
Guinea: 0–14 to 24 wk.	1.9 (0.06–3.75)	Calf: 0–1 yr.	525 (50–1,000)
Pheasant: 0–13 to 43 wk.	1.53 (0.05–3)	Cow	1,200
Chukar: 0–13 to 43 wk.	0.52 (0.04–1)	Bull	2,000
Quail: 0–13 to 43 wk.	0.26 (0.02–0.5)	<b>Deer</b>	
<b>Beef</b>		Fawn: 0–6 mo.	36 (7–65)
Calf: 0–8 mo.	300 (100–500)	Yearling Doe: 6–18 mo.	95 (65–125)
Finishing: 8–24 mo.	950 (500–1,400)	Yearling Buck: 6–18 mo.	110 (65–155)
Cow	1,400	Mature Doe	145
Bull	1,500	Mature Buck	200
<b>Veal</b>		<b>Alpaca</b>	
Calf: 0–20 wk.	270 (95–445)	Young	80 (15–145)
<b>Larger Breed Sheep</b>		Mature Female	145
Lamb: 0–1 yr.	80 (10–150)	Mature Male	170
Ewe	175	<b>Llama</b>	
Ram	225	Cria: 0–1 yr.	85 (20–150)
		Yearling: 1–3 yr.	225 (150–300)
		Mature	325

**Using this worksheet to determine if your farm is a CAO:**

ANIMAL TYPE	NO. ANIMALS	X ANIMAL WEIGHT (LBS)	X PROD. DAYS	÷ FACTOR =	AEU
		X	X	÷ 365,000 =	
		X	X	÷ 365,000 =	
		X	X	÷ 365,000 =	
		X	X	÷ 365,000 =	
		X	X	÷ 365,000 =	
		X	X	÷ 365,000 =	
		X	X	÷ 365,000 =	
				Total* =	
			Acres available for manure		÷
			Animal density: AEUs/acre**		=

\*If the total AEUs on the farm are less than 8, the farm is not a CAO, regardless of the animal density.

\*\*Farms with an animal density of greater than 2 AEUs/acre are defined as CAOs.

Prepared by Douglas Beegle, distinguished professor of agronomy, and Jerry Martin, senior extension associate, in cooperation with and with funding from the Pennsylvania State Conservation Commission.

**extension.psu.edu**

Penn State College of Agricultural Sciences research and extension programs are funded in part by Pennsylvania counties, the Commonwealth of Pennsylvania, and the U.S. Department of Agriculture.

Where trade names appear, no discrimination is intended, and no endorsement by Penn State Extension is implied.

This publication is available in alternative media on request.

Penn State is committed to affirmative action, equal opportunity, and the diversity of its workforce.

Produced by Ag Communications and Marketing

© The Pennsylvania State University 2010

Code UC149 04/14pod