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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 fewer than 8 AEUs is not considered to be a CAO regardless of the animal density.

Animal Equivalent Units

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:

> **AEUs for each type of animal = [average number of animals on a typical day that the animals are there x animal weight (lb) ÷ 1,000] x [number of days the animals are on the operation per year ÷ 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 medium broilers that grow from 0.09 to 5 pounds per animal over the growth cycle, the average weight would calculate to be 2.55 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:

- 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

Animal Inventory (Average weights taken from Table 1)	110 dairy cows @ 1,450-lb average weight each 35 heifers @ 1,000-lb average weight each 20 calves @ 420-lb average weight each 15,000 large broilers @ 3.55-lb average weight each
Production Period	Cows = 365 days per year Broilers = 5 flocks for 57 days each, or 285 days per year
Land Inventory	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 AEUs 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 will often describe on-farm manure utilization and procedures for moving some manure off the farm.

OTHER REQUIRED PLANS

Farms receiving financial or technical assistance from different federal, state, local, or private funding sources may also be required to have a nutrient management plan. Any farm that violates the Clean Streams Law may also be required to develop a nutrient management plan.

VOLUNTARY PLANS

Farms with fewer than 2 AEUs per acre and farms with fewer than a total of 8 AEUs 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 the Penn State Extension office in your county or your local conservation district. For a summary of the Nutrient Management Act and regulations, see "Agronomy Facts 40: Nutrient Management Legislation in Pennsylvania: A Summary of the 2006 Regulations," available from your Penn State Extension county 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 (LB)	X PROD. DAYS	÷ FACTOR =	AEU
Dairy	110	x 1,450	x 365	÷ 365,000 =	159.5
Heifers	35	x 1,000	x 365	÷ 365,000 =	35.0
Calves	20	x 420	x 365	÷ 365,000 =	8.4
Broilers	15,000	x 3.55	x 285	÷ 365,000 =	41.6
		x	x	÷ 365,000 =	
		x	x	÷ 365,000 =	
		x	x	÷ 365,000 =	
				Total* =	244.5
			Acres available for manure**		÷ 100
			AEUs/acre		= 2.45

*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 (LB) DURING PRODUCTION (RANGE)
Dairy, Holstein/Brown Swiss	
Calf: 0–1 year	420 (90–750)
Heifer: 1–2 years	1,000 (750–1,250)
Cow	1,450
Bull	1,700
Dairy, Guernsey/Ayrshire	
Calf: 0–1 year	350 (70–630)
Heifer: 1–2 years	865 (630–1,100)
Cow	1,200
Bull	1,600
Dairy, Jersey	
Calf: 0–1 year	275 (50–500)
Heifer: 1–2 years	675 (500–850)
Cow	1,000
Bull	1,200
Beef	
Calf: 0–8 months	300 (100–500)
Replacement heifer: 8 months to 1 year	500 (300–700)
Finishing: 8–24 months	950 (500–1,400)
Replacement heifer: 1–2 years	875 (700–1,050)
Bull	1,500
Cow	1,400
Backgrounding cattle	500 (300–700)
Veal	
Calf: 0–20 weeks	280 (95–465)
Poultry, Layer	
Pullet, white egg: 0–16 weeks	1.38 (0.08–2.67)
Pullet, brown egg: 0–16 weeks	1.54 (0.08–3.0)
Breeder hen, white egg: 17–70 weeks	3.25 (2.7–3.8)
Breeder rooster, white egg: 17–70 weeks	4.37 (3.67–5.06)
Breeder hen, brown egg: 17–70 weeks	3.55 (2.9–4.2)
Breeder rooster, brown egg: 17–70 weeks	4.78 (4.5–5.06)
White egg: 18–75 weeks	3.13 (2.82–3.44)
White egg: 18–90 weeks	3.14 (2.82–3.46)
Brown egg: 18–75 weeks	3.85 (3.35–4.34)
Brown egg: 18–90 weeks	3.85 (3.35–4.34)
Poultry, Broiler	
Medium: 0–35 days	2.55 (0.09–5.0)
Large: 0–53 days	3.55 (0.09–7.0)
Roaster male: 0–7 weeks	4.70 (0.09–9.3)
Roaster female: 0–9 weeks	4.95 (0.09–9.8)
Breeder pullet: 0–20 weeks	2.55 (0.09–5.0)
Breeder cockerel: 0–20 weeks	3.55 (0.09–7.0)
Breeder hen: 20–65 weeks	6.75 (5.0–8.5)
Breeder rooster: 20–65 weeks	8.75 (7.0–10.5)

TYPE OF ANIMAL	STANDARD WEIGHT (LB) DURING PRODUCTION (RANGE)
Poultry, Turkey	
Tom brooder: 0–6 weeks	3.36 (0.22–6.5)
Hen brooder: 0–6 weeks	2.74 (0.22–5.25)
Hen regular: 6–12 weeks	11.13 (5.25–17)
Hen heavy: 6–16 weeks	14.63 (5.25–24)
Tom: 6–18 weeks	25.25 (6.5–44)
Poultry, Duck	
Starter: 0–17 days	1.36 (0.22–2.5)
Finisher: 17–38 days	4.88 (2.5–7.25)
Developer: 0–196 days	3.21 (0.22–6.2)
Layer	6.85 (6.2–7.5)
Poultry, Game Birds	
Guinea, growing: 0–14 weeks	1.91 (0.06–3.75)
Guinea, mature	3.75
Pheasant, growing: 0–13 weeks	1.53 (0.05–3.0)
Pheasant, mature	3.0
Chukar, growing: 0–13 weeks	0.52 (0.04–1.0)
Chukar, mature	1.0
Quail, growing: 0–13 weeks	0.26 (0.02–0.5)
Quail, mature	0.5
Swine	
Nursery pig	35 (13–57)
Wean to finish	143 (13–273)
Grow finish	165 (57–273)
Gestating sow	450
Sow and litter	470
Boar	450
Sheep, Larger Breed	
Lamb: 0–1 year	95 (10–180)
Ewe	225
Ram	300
Sheep, Medium Breed	
Lamb: 0–1 year	80 (10–150)
Ewe	175
Ram	225
Sheep, Smaller Breed	
Lamb: 0–1 year	45 (10–80)
Ewe	100
Ram	125
Goats, Meat	
Kid: 0–1 year	65 (5–125)
Doe	150
Buck	200

(continued)

Table 1. (continued)

TYPE OF ANIMAL	STANDARD WEIGHT (LB) DURING PRODUCTION (RANGE)
Goats, Dairy	
Kid: 0–1 year	45 (5–85)
Doe	125
Buck	170
Miniature Horses and Donkeys	
Foal: 0–6 months	35 (25–45)
Weanling: 6–12 months	60 (45–75)
Yearling: 12–24 months	100 (75–125)
Two-year-old: 24–36 months	150 (125–175)
Mature	200
Ponies and Donkeys	
Foal: 0–6 months	65 (30–100)
Weanling: 6–12 months	150 (100–200)
Yearling: 12–24 months	300 (200–400)
Two-year-old: 24–36 months	400 (300–500)
Mature	600
Light Horses and Mules	
Foal: 0–6 months	190 (80–300)
Weanling: 6–12 months	450 (300–600)
Yearling: 12–24 months	700 (600–800)
Two-year-old: 24–36 months	900 (800–1,000)
Mature	1,100

TYPE OF ANIMAL	STANDARD WEIGHT (LB) DURING PRODUCTION (RANGE)
Draft Horses	
Foal: 0–6 months	360 (120–600)
Weanling: 6–12 months	800 (600–1,000)
Yearling 12–24 months	1,150 (1,000-1,300)
Two-year-old: 24–36 months	1,450 (1,300–1,600)
Mature	1,800
Bison	
Calf: 0–1 year	275 (50–500)
Yearling: 1–2 years	650 (500–800)
Cow	1,000
Bull	1,600
Deer	
Fawn: 0–6 months	36 (7–65)
Yearling doe: 6–18 months	95 (65–125)
Yearling buck: 6–18 months	110 (65–155)
Mature doe	145
Mature buck	200
Alpaca	
Young	80 (15–145)
Mature female	145
Mature male	170
Llama	
Cria: 0–1 year	75 (25–125)
Yearling: 1–2 years	213 (125–300)
Mature	350

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

ANIMAL TYPE	NO. ANIMALS	X ANIMAL WEIGHT (LB)	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 is less than 8, the farm is not a CAO, regardless of the animal density.
**Farms with an animal density of greater than 2 AEUs per acre are defined as CAOs.

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