

Section I Identification of CAOs

The Nutrient Management Act requires all Concentrated Animal Operations (CAOs) to develop, submit, and implement a nutrient management plan meeting the requirements of the Act and the regulations. **A “Concentrated Animal Operation” (CAO) is defined as an agricultural operation that meets both of the following criteria: 1) contains 8.00 or more Animal Equivalent Units, AND 2) has an animal density in excess of two (2.00) animal equivalent units (or 2,000 lbs), on an annualized basis, per acre of land suitable for manure application.** It should be noted that this definition was changed significantly in 2006, by adding the “8.00 or more AEUs” portion of the determination and non-production livestock, such as boarding horses, to the animal density calculation. There has been much work to define what is meant by this definition, and this work is detailed in this section. The following topics are included under this section.

1. Conservation district assistance with the CAO calculation
2. The CAO calculation
3. Example calculation
4. Appendix 10 CAO Calculation Worksheet

1. Conservation district assistance with the CAO calculation.

- Delegated conservation districts have the **responsibility to assist** with these calculations (other agencies and individuals may also assist) when requested.
- Delegated conservation districts are required to **keep a written record** of their efforts in assisting people with the CAO calculation. This documentation can be used in case an operator comes back to the district and questions the district’s advice in assisting with this determination.
- Delegated conservation districts are required to provide a **targeted outreach effort** to those farmers they think are CAOs, to have these farmers complete the animal density calculation to assure that all CAO farmers are participating in the program. The conservation district is to refer CAOs that refuse to obtain a plan, to the Commission staff for further action.

2. The CAO Calculation

The **equation to calculate the animal density of an operation, for the purpose of determining CAO status, takes into account** the number of animals, the weight of the animals, the amount of time during the year that the animals are located on the operation, and the number of acres to be used for manure application. The generic equation and detailed description below lay out the steps to be followed to complete this calculation.

In general, the equation for calculating the animal density of an operation for the purpose of determining the CAO status of an operation is as follows:

$$\text{the number of animal equivalent units} \div \text{the number of acres}$$

The total AEU figure for the operation, necessary to determine if the operation meets the “at least 8 AEU’s” portion of the CAO determination, is calculated during the process of determining the animal density of the operation. In determining the number of animals to use, the weight of those animals, and the number of acres to include, the program has developed some guidelines to follow to assure consistency in completing this equation. These issues are described below within the detailed description of the equation.

The ‘Standard Animal Weights’ table (Supplement 5 of this manual) provides the necessary “book value” animal weights information that may be needed to complete the CAO calculation described below. A discussion on the use of actual animal weights versus standard animal weights is provided below under *Step 1, (b) Weight per animal*.

Fact sheet 54 entitled “Agronomy Facts 54: Pennsylvania’s Nutrient Management Act (Act 38): Who Is Affected?” provides helpful information and examples related to the topic of calculating animal density for the purposes of determining Act 38 regulatory status.

Detailed description of the AEU and AEU per Acre (CAO) calculation

<u>“AEU and AEU per Acre” CAO status calculation</u>				
<u>Step 1 (calculate AEU’s for each animal type and for the operation)</u>				
no. of animals	X	weight per animal	X	no. of days on the operation
(a)		(b)		(c)
÷ 365 (days/yr) ÷ 1,000 (lbs./AEU) =				
(d)				
(e)				
<u>AEU’s</u>				
(f)				
<u>Step 2 (calculate the total AEU’s for the operation)</u>				
AEU’s for animal group 1 + AEU’s for animal group 2 + AEU’s for animal group 3 + etc. =				
(f)		(f)		(f)
<u>total AEU’s for the operation</u>				
(g)				
<u>Step 3 (calculate the AEU’s per acre)</u>				
total AEU’s for the operation ÷ acres suitable for manure application = AEU’s per acre				
(g)				
(h)				
(i)				

Step 1. Calculate AEU's for each animal type and for the operation:

(a) **Number of animals** = the average number of animals of a particular animal type, on a typical production day (*Information is obtained from the operator*).

Act 38 requires nutrient management plans on larger scale agricultural operations with a high density of livestock per acre. These basic elements of the law have directed the Commission to develop a program that regulates the agricultural community in the management of all livestock animals. For this reason **the CAO status determination is to include all livestock on the operation including animals raised and/or maintained for generating income, food, fiber, work, recreation or transportation**. This determination would not include a family's companion animals such as the family dog(s), cat(s) (including barn cats), etc. This calculation would include all horses, donkeys, lamas, and other animals raised on the operation that would be considered livestock and would not be considered a family's companion animal(s).

Dogs being raised, maintained or produced in commercial dog kennels (such as boarding kennels, rescue and adoption facilities, and breeders) are not considered livestock in Pennsylvania and therefore are not addressed as livestock within the Act 38 program. The handling of the manure generated at these commercial dog facilities is overseen by the DEP regional office under their residual waste regulations. When dealing with nutrient management issues on operations containing a commercial dog kennel, the DEP regional office must be contacted in order to determine how to address the handling of the manure coming from the dogs.

It should be noted that not only are all livestock now considered in the CAO determination, but all livestock on the operation are to be included in all elements of the plan to ensure that the manure they generate is handled appropriately.

(b) **Weight per animal** = estimated weight of the animal (*refer to Supplement 5, "Standard Animal Weight Table" of this manual or use documented weights averaged over the production cycle*).

The **operator may use weights other than those listed in Supplement 5** (the "Standard Animal Weight Table") in determining if his/her operation is a CAO. These non-standard weights must be justified. There may be circumstances where non-standard weights need to be used because of non-standard animals or production cycles used on the operation. For the purposes of this program, justification for non-standard animal weights shall be documented (and furnished upon request to the Commission or delegated district) by the operator in writing. For existing operations, non-standard weights is to be based on past weights of the animals and for proposed operations, non-standard weights are to be based on the animal weights of an identical operation. A statement justifying the need for use of non-standard animal weights, along with the summarized data and calculation that was used for determining these non-standard weights, are to be included in Appendix 10 of the

nutrient management plan when non-standard weights are used. Where there is no data to support the non-standard weights, generally the standard weights in Supplement 5 of this manual shall be used.

There is no specific requirement that animals must be weighed by a representative of the program. The farmer using non-standard weights in their plan must maintain on site, the documentation or data used for determining the non-standard weights in the plan. The preferred method of documenting these non-standard weights is to **maintain on site copies of actual weight slips representing animals on the operation**. Because the CAO calculation will often utilize an average weight over a production cycle, a final market weight may not directly provide this information. An average of the weight at the start and finish of the production cycle would then be used.

For those **animal types not included in Supplement 5 (the “Standard Animal Weights Table”) of this manual**, the average animal weight for the particular operation shall be used for this calculation, taking into account, if applicable, the range of animal weights throughout the production cycle of the animal.

(c) **Number of days on the operation** = the actual number of days out of 365 that these animals are on the operation (*information from operator*)

(d) **365 (days in a year)** = conversion factor to put calculation into a yearly basis (*constant*)

(e) **1,000 (lbs. per AEU)** = conversion factor to change total pounds into AEUs (*constant*)

(f) **AEUs** = the number of Animal Equivalent Units for the particular animal type (*calculated*)

Note: repeat this calculation for each animal group on the operation

Step 2. Calculate the total AEUs for the operation:

(g) **Total AEU**s for the operation = total animal equivalent units for the operation (*calculated, by adding together the AEU*s for all the animal types on the operation to determine the total AEUs for the operation). If an operation has less than a total of 8.00 AEUs based on this calculation, the CAO status determination is complete and the operation is not a CAO. But, if this calculation comes out to 8.00 or more total AEUs for the operation, then you need to continue on with the calculations below to determine animal density and therefore CAO status.

Step 3. Calculate the AEU per acre:

(h) **Acres suitable for manure application** = acres of the operation suitable for manure application (determined using the criteria described below and information from the operator)

According to the regulations, acres that **can be included** in this calculation are:

- cropland, hayland, or pastureland (owned or rented) that is an integral part of the operation.
- land that is or will be used for the application of manure from the operation

Acres that **cannot be included** in the AEU per acre calculation are.

- farmstead and forestland

Lands to be counted in the AEU/acre calculation are those **lands under management control** of the operator where manure is or will be applied under the normal cropping sequence of the operation. Management control generally includes the authority to determine what crops are grown and what nutrients are to be applied. In addition, management control generally relates to those situations where the operator or a person working for the operator is doing the actual farming practices on the land. This includes all owned lands (that are not rented out to another farmer) under the management control of the operator and all rented acres where manure from this operation will be applied to meet crop needs sometime during the normal cropping system. If an operator has rented his owned land to another operator those lands are generally not considered under the owner's management control for the purpose of the CAO calculation. It should be noted that Commission does not require a written rental agreement for rented land, but the operator must be willing to sign a form indicating the amount of rented lands that the operator is managing or in some other way document their control of this land if the Commission would require such documentation.

Only one operator may count the acres of any given field for the purpose of the CAO calculation. For example, where the landowner of a given field rents that field out to a tenant farmer, the landowner in this case cannot count the acres of that field in his/her CAO calculation. The renter of the field may be able to count these acres (based on whether or not he applies manure to this site) because these acres are considered under his management control for the purposes of the CAO calculation.

(i) **AEUs per acre** = This is the final AEU per acre figure used to determine if the particular operation is a CAO or not (calculated). A CAO is an operation having at least 8.00 AEU's, **and** where the animal density of the operation exceeds two (2.00) AEU's per acre on an annualized basis.

- For the purposes of determining if a particular operation is a CAO or not, the AEU/acre calculation **may be rounded off to the nearest 100th** of an AEU/acre. Two examples are:

1.638 AEU's/acre would equal 1.64

1.9523 AEU's/acre would equal 1.95

For operations that have no acres to count in this determination (such as operations that rent out all their owned acres, or operations that just rent a barn but no acres), the AEU per acre calculation assumes 1 acre of land under their management control. So in the case where an operator has no land to include in this calculation, the AEU figure for the operation will match the AEU per acre figure. For example, a farmer raising 2,400 finishing hogs (calculated to be 320 AEU) in a rented barn, and they do not rent any acres at the site or elsewhere for application of the manure, would be calculated to have an AEU per acre figure of 320 AEU per acre.

3. Example Calculation

An example of this calculation is shown below and how this information is to be listed on the standard plan is **shown in the sample nutrient management plan** (Supplement 2).

Example Farm Data:

Animal Inventory 110 dairy cows @ 1,300-lb
 35 heifers @ 900-lb average weight
 20 calves @ 375-lb average weight
 15,000 heavy broilers @ 3-lb average weight

(Average weights taken from Supplement 5)

Production Period Cows, heifers, and calves = 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

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
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.

4. Appendix 10 CAO Calculation Worksheet

For hand calculated Act 38 plans (plans developed NOT using the Act 38 approved computer spreadsheet program), a copy of the hand calculated, "CAO Calculation Worksheet" must be completed and included in Appendix 10 of the submitted nutrient management plan. This hand calculated worksheet is not required for plans developed using the Act 38 computer spreadsheet program.