

# VCS MODULE VMD0027

## ESTIMATION OF DOMESTICATED ANIMAL POPULATIONS

Version 1.0

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Sectoral Scope 14



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## 1 SOURCES

Safley LM, P. Jun, M. Gibbs, CH<sub>4</sub> and N<sub>2</sub>O emissions from livestock manure, IPCC background paper

## 2 SUMMARY DESCRIPTION OF THE MODULE

The module provides methods for estimating domesticated animal populations on an average annual basis, broken down by type of animal, as well as the manure management systems associated with each population.

## 3 DEFINITIONS

**Livestock:** Domesticated animals including dairy cattle, non-dairy cattle, buffalo, sheep, goats, camels, horses, mules, asses, swine, poultry, alpacas and llamas

## 4 APPLICABILITY CONDITIONS

None

## 5 PROCEDURES

Project proponents must gather data on two basic variables: livestock populations by type, and manure management system.

### Livestock Populations

Data must be collected on the average annual population of livestock for each of the species listed below. Note that the population may vary depending on the time at which the census is taken. For example, a census taken before calves are born yields a lower number of animals than a census taken after calves are born. Therefore, the average annual population must represent estimate of the average livestock population over an entire year. Livestock types which must be included in a census are:

- Dairy cattle
- Non-dairy cattle
- Buffalo
- Sheep
- Goats
- Camels
- Horses
- Mules and asses
- Swine
- Poultry
- Lamas
- Alpacas

Dairy cattle populations must be recorded separately from other cattle populations. Dairy cattle are defined as mature cows producing milk in commercial quantities for human consumption, and are

managed differently from non-dairy cattle. This generally results in differences in composition and methane production potential between dairy and non-dairy cattle manure. Additionally, dairy cattle manure is often managed differently from non-dairy cattle manure.

In some countries, there are two types of dairy cows: high-producing, “improved” breeds in commercial operations and low-producing breeds managed with traditional methods. If there are two types of dairy cows within the project area, dairy cow populations must be separated into these two groups. The dairy cow group does not include cows used mainly for producing calves or for draft power (for example, plowing), as those cows are accounted for in non-dairy cattle group.

In addition, livestock populations must be described in terms of warm or cool temperature climates for purposes of estimating livestock manure emissions. Data on the annual average temperature of the regions where livestock are managed must be categorized as follows:

- Areas with annual average temperatures less than 15°C are defined as cool;
- Areas with annual average temperatures from 15°C to 25°C inclusive are defined as temperate, and
- Areas with annual average temperatures greater than 25°C are defined as warm.

The fraction of each livestock population falling into each climate area must be estimated, if the area contains more than one climate. This data can be developed from local climate maps and other sources.

### **Manure Management**

In addition to the livestock population data described above, data must also be collected on the percentage of manure from each livestock type managed with each management system. The types of manure management systems are:

- Pasture/Range/Paddock - The manure from pasture and range grazing animals is allowed to lie as is, and is not managed.
- Daily Spread - Manure is collected in solid form by some means such as scraping. The collected manure is applied to fields regularly (usually daily).
- Solid Storage - Manure is collected as in the daily spread system, but is stored in bulk for a long period of time (months) before any disposal.
- Dry Lot - In dry climates animals may be kept on unpaved feedlots where the manure is allowed to dry until it is periodically removed. Upon removal, the manure may be spread on fields.
- Liquid/Slurry - These systems are characterized by large concrete-lined tanks built into the ground. Manure is stored in the tank for six or more months until it can be applied to fields. To facilitate handling as a liquid, water may be added to the manure.
- Anaerobic Lagoon - Anaerobic lagoon systems are characterized by flush systems that use water to transport manure to lagoons. The manure resides in the lagoon for periods from 30 days to over 200 days. The water from the lagoon may be recycled as flush water or used to irrigate and fertilize fields.
- Pit Storage - Liquid swine manure may be stored in a pit while awaiting disposal – the length of storage must be documented
- Anaerobic Digester - The manure, in liquid or slurry form, is anaerobically digested to produce methane gas for energy.
- Burned for fuel: manure is collected and dried in cakes and burned for heating or cooking.

If local, regional or country-specific data on manure management practices exists it must be used. If it is not available, default IPCC manure management practice data for major regions based on Safley, et al.

(1992) must be used. If the available data predates current manure management practices within the project area; it must be updated to reflect such current practices.

The project proponent should document the data sources and timing of data collection for all data on livestock populations and manure management systems.

## **6 PARAMETERS**

None

## **7 REFERENCES AND OTHER INFORMATION**

Safley LM, P. Jun, M. Gibbs, CH<sub>4</sub> and N<sub>2</sub>O emissions from livestock manure, IPCC background paper: [http://www.ipcc-nggip.iges.or.jp/public/gp/bgp/4\\_2\\_CH4\\_and\\_N2O\\_Livestock\\_Manure.pdf](http://www.ipcc-nggip.iges.or.jp/public/gp/bgp/4_2_CH4_and_N2O_Livestock_Manure.pdf) (Last visited 16-09-2011)

UNFCCC CDM, *Tool for testing significance of GHG emissions in A/R CDM project activities*, (Last visited 16-09-2011, <http://cdm.unfccc.int/methodologies/ARmethodologies/tools/ar-am-tool-04-v1.pdf>)

## DOCUMENT HISTORY

Version	Date	Comment
v1.0	16 Nov 2012	Initial version released