

From: "5.1.2.e" <5.1.2.e@rivm.nl>
Sent: Wed, 1 Oct 2025 10:36:42 +0200
To: "5.1.2.e" <5.1.2.e@cbs.nl>; "5.1.2.e" <5.1.2.e@cbs.nl>
Subject: RE: enterische fermentatie geiten en schapen

[Externe email]

Hoi 5.1.2.e

Jazeker.

From: 5.1.2.e <5.1.2.e@cbs.nl>
Sent: woensdag 1 oktober 2025 09:28
To: 5.1.2.e <5.1.2.e@rivm.nl>; 5.1.2.e <5.1.2.e@cbs.nl>
Subject: RE: enterische fermentatie geiten en schapen

Dankjewel 5.1.2.e!
En ze gelden voor de hele tijdreeks neem ik aan?

Groet, 5.1.2.e

Van: 5.1.2.e <5.1.2.e@rivm.nl>
Verzonden: woensdag 1 oktober 2025 09:09
Aan: 5.1.2.e <5.1.2.e@cbs.nl>; 5.1.2.e <5.1.2.e@cbs.nl>
Onderwerp: enterische fermentatie geiten en schapen

[Externe email]

Hoi 5.1.2.e en 5.1.2.e

De nieuwe EF voor schapen en geiten is 9 kg CH4 per dier per jaar.

TABLE 10.10
ENTERIC FERMENTATION EMISSION FACTORS FOR TIER 1 METHOD¹
(KG CH₄ HEAD⁻¹ YR⁻¹)

Livestock	Developed countries	Developing countries	Liveweight
Buffalo	55	55	300 kg
Sheep	8	5	65 kg - developed countries; 45 kg - developing countries
Goats	5	5	40 kg
Camels	46	46	570 kg
Horses	18	18	550 kg
Mules and Asses	10	10	245 kg
Deer	20	20	120 kg
Alpacas	8	8	65 kg
Swine	1.5	1.0	
Poultry	Insufficient data for calculation	Insufficient data for calculation	
Other (e.g., Llamas)	To be determined ¹	To be determined ¹	

All estimates have an uncertainty of ± 30 -50%.

Sources: Emission factors for buffalo and camels from Gibbs and Johnson (1993). Emission factors for other livestock from Crutzen *et al.*, (1986), Alpacas from Pinares-Patino *et al.*, 2003; Deer from Clark *et al.*, 2003 .

¹ One approach for developing the approximate emission factors is to use the Tier 1 emissions factor for an animal with a similar digestive system and to scale the emissions factor using the ratio of the weights of the animals raised to the 0.75 power. Liveweight values have been included for this purpose. Emission factors should be derived on the basis of characteristics of the livestock and feed of interest and should not be restricted solely to within regional characteristics.

TABLE 10.10 (UPDATED)^{2,3}
ENTERIC FERMENTATION EMISSION FACTORS FOR TIER 1 METHOD (KG CH₄ HEAD⁻¹ YR⁻¹)

Livestock	High Productivity Systems ¹	Low Productivity Systems	Liveweight ⁷
Sheep	9	5	65 kg – high productivity systems 45 kg – low productivity systems
Swine ⁶	1.5	1	72 kg - high productivity systems 52 kg - low productivity systems
Goats ⁵	9	5	50 kg – high productivity systems 28 kg – low productivity systems
Horses	18		550 kg
Camels	46		570 kg
Mules and Asses	10		245 kg
Deer	20		120 kg
Ostrich ⁴	5		120 kg
Poultry	Insufficient data for calculation		
Llamas and Alpacas	8		65 kg
Other (e.g., bison)	To be determined		
All estimates have an uncertainty of $\pm 30\text{-}50\%$.			
Sources: Emission factors: camels from Gibbs & Johnson (1993); Alpacas from Pinares-Patino <i>et al.</i> (2003); Deer from Clark <i>et al.</i> (2003); Sheep (High productivity systems) derived from Swainson <i>et al.</i> (2016). Sources and assumptions to calculate goats EFs are detailed in Annex 10B.3. Emission factors for other livestock from Crutzen <i>et al.</i> (1986), ¹ For the application of the simple Tier 1, for all regions other than North America, Europe and Oceania the Tier 1 default values are the low productivity EFs. ² One approach for developing the approximate emission factors is to use the Tier 1 emissions factor for an animal with a similar digestive system and to scale the emissions factor using the ratio of the weights of the animals raised to the 0.75 power. Liveweight values have been included for this purpose. Emission factors should be derived on the basis of characteristics of the livestock and feed of the animals and compilers should not base their decision of an emission factor entirely on regional characteristics. ³ The enteric fermentation emission factor shall be applied for the whole livestock population including non-mature animals. ⁴ CH ₄ EF for ostrich was calculated based on Frei <i>et al.</i> (2015) and Danish NIR (Nielsen <i>et al.</i> 2018). ⁵ Sources and assumptions to adjust weight of goats for low- and high-productivity systems are detailed in Annex 10B.3. ⁶ The values of swine weight for low and high productivity systems were obtained from FAO GLEAM databases (FAO 2017). More detailed data on swine weight are reported in Annex 10A.2 (in Table 10A.5). Crutzen <i>et al.</i> (1986) did not report weights for swine. Regional Tier 2 calculations for swine have been carried out by the FAO GLEAM research group, countries could consult these values for consistency with their production systems for refinement to their emission factors. ⁷ If a country-specific liveweight of animal category is different from those reported in Table 10.10, an inventory-compiler may use the approach presented in section 10.2.4 of the current chapter. It is recommended to continue to use Tier 1 emission factor uncertainty ranges as defined in Section 10.3.4 of the 2006 IPCC Guidelines.			

Met vriendelijke groet,

5.1.2.e

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