

## Sources of Greenhouse Gases By Different Ruminants (Lifecycle Analysis)

		Dairy Cows	Beef Cows	Sheep Goats	Sheep Goats
		Milk	Meat	Milk	Meat
Manure Appl. & Deposits	N <sub>2</sub> O	17.0%	18.1%	15.6%	17.6%
Manure " "	CH <sub>4</sub>	3.8%	1.4%	1.9%	2.0%
Manure Storage	N <sub>2</sub> O	5.4%	3.6%	3.8%	2.0%
Fertilizer	N <sub>2</sub> O	7.4%	7.4%	7.3%	8.8%
Feed Production	CO <sub>2</sub>	10.9%	10.0%	12.3%	11.1%
Land Use Change (Soy)	CO <sub>2</sub>	0.7%	0.7%		
Land Use Pasture Exp.	CO <sub>2</sub>		14.8%		
Enteric Fermentation	CH <sub>4</sub>	46.5%	42.6%	57.2%	54.9%
Direct Energy Use	CO <sub>2</sub>	2.2%	0.9%	1.6%	1.8%
Post Farm Processing	CO <sub>2</sub>	6.1%	0.5%	0.3%	1.7%

**Question 1: How much CO<sub>2</sub> is generated by Meat Consumption (Ruminants only) per Person in your country**

**Question 2: How much water is Required to Produce the Meat Consumed in your country**

**Question 1:**

**FAO Stats - Data Base: Go To : Livestock Primary**

**Select: Cattle Meat, Goat Meat and Sheep Meat for your Country (2017)**

**Select: Cow Milk, Sheep Milk, Goat Milk in your Country (2017)**

**Go To: Population Data, Select Population in Your Country (2017)**

**Combine Goat and Sheep Meat and Goat and Sheep Milk**

**Use Conversion Table to convert kg of Product to kg of CO<sub>2</sub> Emission**

**Use Population Data to Arrive at kg CO<sub>2</sub> (equ) / Capital/ Year**

**Results: CO<sub>2</sub> Emission from Red Meat Consumption/c/y in you Country**

## Average Production of CO<sub>2</sub> (equ)/ Kg of Product by Cattle in Different Regions

Meat Production				Milk Production			
Kg CO <sub>2</sub> /Kg Meat	Arid	Temp.	Humid	Kg CO <sub>2</sub> /Kg Milk	Arid	Temp.	Humid
W-Europe	20	19	24	W-Europe	1.6	1.7	1.7
Asia	68	41	74	Asia	3.4	3.2	5.3
L America	44	49	50	L America	3.1	2.0	4.4
MENA	32	20	30	MENA	5.1	3.5	4.4
Africa	104	51	76	Africa	9.8	5.9	10.3

## Average Production of CO<sub>2</sub> (equ)/ Kg Product by Sheep & Goats in Different Regions

Meat Production				Milk Production			
Kg CO <sub>2</sub> /Kg Meat	Arid	Temp.	Humid	Kg CO <sub>2</sub> /Kg Milk	Arid	Temp.	Humid
W-Europe	14	19	22	W-Europe	4.8	4.9	4.2
Asia	35	27	18	Asia	6.2	8.2	7.9
L America	28	30	24	L America	7.0	6.5	7.2
MENA	24	38	16	MENA	10.0	7.0	8.5
Africa	30	25	34	Africa	7.0	7.2	8.0

Data Source: Opio, C, et al. 2013. GHG Emissions from ruminan supply Chain. A Global Live Cycle Assessmnt. FAO, Rome

## Question 2:

**FAO Stats - Data Base: Go To : Livestock Primary**

**Select: Cattle Meat, Goat Meat and Sheep Meat for your Country (2017)**

**Select: Cow Milk, Sheep Milk, Goat Milk in your Country (2017)**

**Go To: Population Data, Select Population in Your Country (2017)**

**Use the conversion Table to determine Water Requirement/ kg of Meat for Cattle, Goats, Sheep and Cow Milk.**

**Use Population Data to arrive at Liters of Water/Capita/Year (for meat & Milk**

**Units m<sup>3</sup>/Ton or Liters/Kg**

	China	India	Mexico	Italy	World Mean
Beef	12560	16480	37762	21167	15500
Goat	3994	5187	10252	4180	4000
Sheep	5202	6692	16878	7572	6100
Milk (Cow)	1000	1369	2382	861	1000

**Results: Water for Red Meat Consumption in L/C/Y or Kg Water for Meat/C/ Y**