

APROXIMATE CALCULATION OF ANIMAL UNIT (AU) AND ANIMAL DENSITY

farm, _____ year

Animals and housing type	Type of manure removal and storage	One animal makes AU	Number of animals	AU on farm (columns 3X4)
1	2	3	4	5
Sow with 18 piglets under 20 kg weight				
In pens	With bedding	0.35		
Fatling pigs (one animal from 20 to 100 kg weight per fatling cycle of 180 d.)				
On slatted floor	Washing away with water or self-passing flow	0.04		
In shallow pigsty	Transporter or other way	0.04		
In deep pigsty	With bedding	0.07		
Cow of milk productivity of 3000 kg				
Tied housing	Transporter	0.73		
Loose housing in boxes	Washing away with water	0.63		
On deep litter	Stored in barn	0.81		
Cow of milk productivity of 5000 kg				
Tied housing	Transporter	1.00		
Loose housing in boxes	Washing away with water	0.88		
On deep litter	Stored in barn	1.09		
Cow of milk productivity of 7000 kg				
Tied housing	Transporter	1.25		
Loose housing in boxes	Washing away with water	1.11		
On deep litter	Stored in barn	1.36		
Calves (one animal under 6 months old)				
On deep litter	Stored in barn	0.10		
From 4 months on slatted floors	Washing away with water	0.10		
Tied housing	Transporter or other way	0.10		
Heifers from 6 to 24 months old (on average)				
On deep litter	Stored in barn	0.42		
On slatted floors	Washing away with water	0.28		
Tied housing	Transporter	0.36		
Fatling cattle (under 420-500kg weight or between 6 and 18-21 months old)				
On deep litter	Stored in barn	0.68		
On slatted floors	Washing away with water	0.47		
Tied housing	Transporter	0.59		
Beef cow with calf				
On deep litter	Stored in barn	0.83		
Horses (500 kg)				
Loose housing in stalls	Various way of manure removal	0.81		
Sheep, indoor-outdoor system				
In shallow or deep barn	Various way of manure removal	0.07		
Hens				
On deep litter	Stored in barn	0.0080		
In coops without litter	Transporter or other way	0.0071		
Chicken broilers				
On deep litter	Stored in barn during feeding cycle	0.0006		
In coops without litter	Transporter or other way	0.0006		
Other poultry (ducks, geese, turkeys)				
On deep litter	Stored in barn	0.0181		
Total AU (sum of column 5)				
Area of used agricultural land (AL) on farm ha				
Animal density AU ha (the sum of column 5 divided by area of AL)				

CALCULATION OF THE AREA OF MANURE PAD

_____ farm, _____ year

Animal	Manure from one animal per month m ³	Number of animals	Total volume of manure, m ³ (columns 2X3)
1	2	3	4
Cow of milk productivity of 3000 kg	1,47		
Cow of milk productivity of 5000 kg	1,68		
Cow of milk productivity of 7000 kg	1,86		
Calf under 6 months old	0,29		
Heifer from 6 to 24 months old	0,80		
Fatling cattle from 6 to 21 months	1,06		
Beef cow with calves	1,39		
Sow with piglets under 20 kg	0,49		
Fatling pig from 20 to 100 kg	0,12		
Horses	1,33		
Sheep	0,19		
Hens	0,0046		
Broilers	0,0083		
Other poultry (ducks, geese, turkeys)	0,010		
TOTAL PER 1 MONTH m ³			
*STORAGE PERIOD MONTHS			
MANURE TOTAL PER CALCULATED PERIOD m ³			
**HEIGHT OF MANURE PILE IN MANURE STORAGE m			
AREA OF MANURE STORAGE m ²			

* The manure storage period is written (6-12 months) and multiplied by the total volume of manure accumulated per 1 month.

** The planned height of the manure pile in the manure storage is written here. The total volume of manure accumulated in the whole period is divided by the planned height of the manure pile and then the area of the manure storage is received.

CALCULATION OF THE VOLUME OF LIQUID MANURE RESERVOIR AT THE MANURE PAD

_____ farm, _____ year

Animal	Liquid manure from one animal per month m ³	Number of animals	Total volume per month m ³ (columns 2X3)
1	2	3	4
Cow of milk productivity of 3000 kg	0,41		
Cow of milk productivity of 5000 kg	0,47		
Cow of milk productivity of 7000 kg	0,53		
Calf under 6 months old	0,04		
Heifer from 6 to 24 months old	0,22		
Fatling cattle from 6 to 21 months	0,29		
Beef cow with calves	0,38		
Sow with piglets	0,13		
Fatling pig	0,04		
Horses	0,00		
Sheep	0,00		
Hens	0,00		
Broilers	0,00		
Other poultry (ducks, geese, turkeys)	0,00		
TOTAL PER 1 MONTH m³			
*STORAGE PERIOD MONTHS			
LIQUID MANURE TOTAL PER CALCULATED PERIOD m³			
Washing effluents and precipitation water for open reservoirs are additionally added			Total per storage period m³
Additionally 0.3 m ³ of water is used per cow per 1 month	** Number of cows	Storage period months	
Precipitation from manure pad (0.037 m ³ from 1m ² per 1 month)	*** Area m ²	Storage period months	
TOTAL VOLUME INCLUDING PRECIPITATION AND EFFLUENTS m³			

* Liquid manure storage period is written (6-12 months) and multiplied by the total volume of the liquid manure accumulated per 1 month.

** The number of cows, the period of liquid manure storage are written and then multiplied by the amount of water used per 1 month, i.e. 0.3 m³.

*** The calculated area of the manure storage, the period of manure storage are written and then multiplied by the amount of precipitation water per 1 month, i.e. 0.037 m³.

CALCULATION OF THE VOLUME OF SLURRY RESERVOIR

_____ farm, _____ year

Animal	Slurry per 1 month m ³	Technological water per 1 month m ³	Slurry and technological water m ³ (columns 3+4)	Number of animals	Total per month m ³ (columns 4X5)
1	2	3	4	5	6
Cow of milk productivity of 3000 kg	1,37	0,60			
Cow of milk productivity of 5000 kg	1,58	0,75			
Cow of milk productivity of 7000 kg	1,76	0,80			
Heifer from 6 to 24 months old	0,73	0,30			
Fatling cattle from 6 to 21 months	0,99	0,45			
Sow with 18 piglets under 20 kg	0,43	0,15			
Fatling pigs	0,12	0,15			
TOTAL PER 1 MONTH m³					
*STORAGE PERIOD MONTHS					
SLURRY TOTAL PER PLANNED PERIOD m³					
Precipitation water can be additionally added for open reservoirs					<i>Total per storage period m³</i>
**Precipitation from reservoir surface area S (0.037 m ³ for 1 m ² per 1 month)			Storage period months		
0.3 m ³ of water are additionally used to wash milking equipment per cow per 1 month		*** Number of cows	Storage period months		
TOTAL VOLUME INCLUDING PRECIPITATION AND EFFLUENTS m³					

* Slurry storage period is written (6-12 months) and multiplied by the total volume of the slurry accumulated per 1 month.

** The amount of precipitation from the surface of the reservoir is multiplied by the period of slurry storage.

*** The number of cows, the period of slurry storage (6-12 months) are written and then multiplied by the amount of water used per 1 month, i.e. 0.3 m³.

CALCULATION OF FERTILIZATION PLAN

farm, _____ year

Field No	Area ha	Previous crop	Crop of the year	Expected yield t/ha	Data of soil analyses			Crop need for nutrients kg/ha			Manure t/ha			Mineral fertilizer					
					pH	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	kg/ha	P	kg/ha	K	kg/ha
						mg/kg	mg/kg												
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1														Ammon. Nitrate		Super-phosphate		Potassium chloride	
2														Ammon. Nitrate		Super-phosphate		Potassium chloride	
3														Ammon. Nitrate		Super-phosphate		Potassium chloride	
4														-		Super-phosphate		Potassium chloride	
AVG for 1 ha														Ammon. Nitrate		Super-phosphate		Potassium chloride	

To fill columns 1-5 from the field plan indicating the estimated yield.

To fill columns 6-8 using the soil agrochemical data from the laboratory analyses.

In columns 9-11 to write the nutrient amount taken from soil (Annex 3.4.) multiplied by the expected yield.

To calculate the nutrient uptake from manure (columns 12-14) using Annex 3.3. To take first and second year uptake of nitrogen, phosphorus and potassium from manure from Table 3.1 in Chapter 3.

To calculate the need of mineral fertilizer (columns 15-20) for crops that are fertilised by manure as following:

- Crop need for nutrients (columns 9-11) minus the amount of nutrients uptake from manure (columns 12-14).
- To calculate nitrogen need in the form of ammonium nitrate keeping in mind that it contains 34 kg N per 100 kg.
- To calculate phosphorus need in the form of super-phosphate keeping in mind that it contains 20 kg P₂O₅ per 100 kg.
- To calculate potassium need in the form of potassium chloride keeping in mind that it contains 60 kg K₂O per 100 kg.

Notes: 1. The need of other fertilisers is calculated according to the nutrient concentration in those fertilisers.

2. If nutrient storage in soil is sufficient, the fertilisation plan is made according to the amount of nutrients taken up by harvest. When the storage of some nutrient is not sufficient, the fertilization plan has to be adjusted correspondingly.

