

Nitrogen balance from pig farms

Denmark
2000

Nitrogen inputs and outputs from farms

The Danish aquatic environment plan focuses on reducing societies nitrogen discharge to the aquatic environment. Farming is one of the biggest contributors this to discharge, which is why it is useful to have an overview of the nitrogen balance in Danish farming, which is given here. The data presented refers to production of nitrogen from different types of Danish pig farms in 2000. For process description, data collection and treatment etc. please look at the processes for each farm type ([Here](#)).

The nitrogen balance data presented is divided in to three tables:

[Table 1](#): Characteristics and area-based average of mixed pig farms in Denmark

[Table 2](#): Farm gate Nitrogen turnover and loss at mixed pig farms in Denmark

[Table 3](#): Field Nitrogen turnover at mixed pig farms in Denmark

Table 1: Characteristics and area-based average of mixed pig farms in Denmark

Soil type	Loamy (clay)			Sandy		
	<1.4	1.4-2.3	>2.3	<1.4	1.4-2.3	>2.3
Farmtype (LSU ha ⁻¹)						
Data						
Number of farms in dataset	50	27	98	83	182	23
Area represented by farm type (1000ha)	77	33	97	177	48	156
Herd balance						
Dairy per farm (cows farm ⁻¹)	0	0	0	48	67	56
LSU ¹ per farm (LSU farm ⁻¹)	40	111	169	81	109	87
Stocking rate (LSU ha ⁻¹)	0.7	1.4	2.5	0.8	1.4	2.5
Feed uptake, 100 SFU LSU ⁻¹ y ⁻¹	46	44	47	47	47	46
N uptake, kg N LSU ⁻¹ y ⁻¹	151	146	150	153	148	152
N-efficiency, herd ³⁾	34.4%	37.4%	35.6%	36.3%	34.1%	35.8%
Area						
Total farm area (ha farm ⁻¹)	58	77	68	81	65	99
Crop rotation (% of farm area)						
Permanent grass	1	1	2	9	11	9
Set-aside	6	7	5	7	6	6
Cereal for harvest	75	77	73	40	19	46
Maize/whole crop silage	0	0	0	16	32	13
Grass/clover in rotation	1	1	0	18	26	14

Production						
Cereals yield (hkg ha ⁻¹)	63	66	70	52	49	56

1) Livestock units (LSU), DK definition: 0.85 LSU=1 dairy cow on 7,500 l milk year⁻¹

2) N-eff = output of animals products/input of feed

Table 2: Farm gate Nitrogen turnover and loss at mixed pig farms in Denmark (kg N ha⁻¹ year⁻¹)

Soil type	Loamy (clay)			Sandy		
	<1.4	1.4-2.3	>2.3	<1.4	1.4-2.3	>2.3
Farmtype (LSU ha ⁻¹)						
Farm gate balance						
Mineral fertilizer	115	96	80	92	72	59
Organic fertilizer & living animals ³⁾	16	10	-50	16	10	-53
Supplement feed	57	160	327	72	164	332
Straw for bedding ³⁾	-6	-6	-5	-7	-6	-5
Fixation	3	2	1	4	4	5
Precipitation	16	16	16	16	16	16
Total input	201	276	369	193	260	354
Meat	-46	-89	-152	-51	-80	-154
Cash crops	-45	-46	-55	-34	-34	-32
Total output	-91	-135	-207	-85	-114	-186
Farm N-balance	110	141	163	108	146	168
N loss, stable and storage	-14	-27	-49	-15	-28	-50
Field N balance	97	114	114	93	119	118
Field N-efficiency ⁴⁾	51%	48%	49%	48%	42%	43%
N loss, field						
Fertilization, spreading	-9	-12	-14	-9	-12	-13
Crops	-5	-5	-5	-5	-5	-5
Denitrification	-15	-29	-31	-8	-10	-12
Leaching ⁵⁾	-68	-68	-64	-72	-92	-89

3) Net import = import-export of manure, straw and living animals

4) N-eff = output/input

5) Leaching = field N balance - N loss (fertilization+crops+denitrification)

Table 3: Field Nitrogen turnover at mixed pig farms in Denmark (kg N ha⁻¹ year⁻¹)

Soil type	Loamy (clay)			Sandy		
	<1.4	1.4-2.3	>2.3	<1.4	1.4-2.3	>2.3
Farmtype (LSU ha ⁻¹)						
Input						
Mineral fertilizer	115	94	80	92	72	59
Imported organic fertilizer ⁶⁾	6	0	0	6	0	0
Produced manure	56	106	128	60	111	126
Fixation	3	2	1	4	4	5
Precipitation	16	16	16	16	16	16
Total input	196	218	225	178	203	206

Output						
Cash crop	-13	-11	-18	-13	-9	-12
Grain	-32	-35	-37	-20	-23	-21
Grain for feed ⁷⁾	-43	-47	-46	-41	-39	-43
Straw harvested	-7	-8	-9	-8	-9	-9
Straw mulched ⁸⁾ (Not in output)	-9	-9	-9	-7	-5	-5
Roughage for feed ⁷⁾	-3	-1	-1	-2	-1	-3
Roughage not utilized by own herd ⁹⁾	-1	-2	0	-1	-3	0
Total output	-99	-104	-111	-85	-84	-88
Output without roughage¹⁰⁾	-96	-103	-110	-83	-83	-84
Field N balance	97	114	117	93	119	118
Field N-efficiency ⁴⁾	51%	48%	49%	48%	42%	43%

4) N-eff = output/input

6) Average include not presented farms with more than 2.3 LSU ha⁻¹

7) Used for feed for own herd

8) Straw left on field, not included in balance

9) Factor = 0 = not include in balances

10) Output without roughage, sum of output from cash crops, cereals and straw

Administrative information

Data URL: <http://www.lcafood.dk/processes/agriculture/dairyfarms.html>

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References