

## Prüfung auf Plausibilität und Korrektur der Datensätze der Umfrage zur Abschätzung von Ammoniak-Verlusten 2007

*Testing plausibility and correction of datasets from the survey for the evaluation of ammonia losses 2007*

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Das vorliegende Dokument beschreibt das Vorgehen zur Prüfung auf Plausibilität und Korrektur der Datensätze der Umfrage zur Abschätzung von Ammoniak-Verlusten 2007. Es ist nur auf Englisch verfügbar. Die einzelnen Arbeitsschritte sind entsprechend der Reihenfolge des Fragebogens geordnet. Ein Muster des Fragebogens (deutsche Fassung) ist online verfügbar (<http://agrammon.ch/downloads/>). Die roten Zahlen und Buchstaben im Fragebogen entsprechen den Codes in Spalte A.

Prüfung auf Plausibilität und Korrektur der Datensätze erfolgten mittels Datenbankprogramm "Microsoft Access". In Fällen, wo die Programmierung zu aufwändig war, wurde die Plausibilisierung von Hand durchgeführt. Die betroffenen Arbeitsschritte sind in der Tabelle gekennzeichnet.

*The present document describes the plausibility checks and the correction of the datasets resulting from the survey for evaluation of ammonia losses 2007. The procedure is listed according to the structure of the questionnaire. A specimen of the German questionnaire used for the mail survey can be obtained from <http://agrammon.ch/downloads/>. Red numbers and letters correspond to the codes of the Category/Entry used in the column "A Category/Entry" of the table below.*

*The plausibility checks and the correction of the datasets were performed using "Microsoft Access". In cases the procedure for correction was too laborious to program it was performed manually. The procedures are marked specifically in the table*

No	A Category/Entry*	B Criterion for plausibility	C Correction
1	2101(a,b,c,d,e and j)	If a questionnaire includes 2 entries or more for the type of housing systems for dairy cows 2101(a,b,c,d,e or j)	The maximum number of housing types for modelling in Agrammon was set to 2
2	2101(a,b)	2 entries in 2101(a and b)	50% of the dairy cows were assigned to each of the type of housing TiedHousingSlurry (2101(a)) and TiedHousingLiquidSolid (2101(b)), respectively.

No	A Category/Entry*	B Criterion for plausibility	C Correction
3	2101(a or b) and 2101(c,d,e or j)	2 entries in 2101(a or b) and 2101(c,d,e or j)	10% of the dairy cows were assigned to the entered type of housing TiedHousingSlurry (2101(a)) or TiedHousingLiquidSolid (2101(b)) and 90% to the entered type of housing LooseHousingSlurry (2101(c)), LooseHousingLiquidSolid (2101(d or e)) or LooseHousingDeepLitter (2101(j)), respectively.
4	2101(c,d,e or j)	2 entries in 2101(c,d,e or j)	50% of the dairy cows were assigned to the entered type of housing LooseHousingSlurry (2101(c)), LooseHousingLiquidSolid (2101(d or e)) or LooseHousingDeepLitter (2101(j)) and 50% to the other entered type of housing, respectively.
5	2101(a and/or b) and 2101(c,d,e and/or j)	More than two entries in 2101(a and/or b) and 2101(c,d,e and/or j)	10% of the dairy cows were assigned to the type of housing TiedHousingLiquidSolid (2101(b)) and 90 % to LooseHousingLiquidSolid (2101(d)), respectively.
6	2101(c,d,e or j)	More than two entries in 2101(c,d,e or j)	50% of the dairy cows were assigned to the type of housing LooseHousingSlurry (2101(c)) and 50% to the type of housing LooseHousingLiquidSolid (2101(d)), respectively.
7	2101(a,b,c,d,e and j)	If a farm includes dairy cows according to the statistical data of the FSO <sup>1</sup> and an entry for the housing system is missing	Missing entries were corrected as follows: the distribution of TiedHousing types and LooseHousing types was calculated for each farm class. The calculated distribution was applied to the housing types TiedHousingLiquidSolid (2101(b)) and to LooseHousingLiquidSolid (2101(d)), respectively.
8	2102(a,b,c,d,e and j) to 2104(a,b,c,d,e and j) <sup>#</sup>	If a farm includes heifers1yr, heifers2yr, heifers3yr according to the statistical data of the FSO, a corresponding entry for the housing system is required	Entries for housing systems 2102(a,b,c,d,e and j) were reassigned to the animal category present on a farm according to the statistical data of the FSO. This procedure was performed manually. Idem for 2103(a,b,c,d,e and j) and 2104(a,b,c,d,e and j)
9	2102(a,b,c,d,e and j) to 2104(a,b,c,d,e and j)	If a questionnaire includes 2 entries or more for the type of housing systems for heifers3yr 2102(a,b,c,d,e or j)	The maximum number of housing types for modelling in Agrammon was set to 2 Idem for 2103(a,b,c,d,e or j) and 2104(a,b,c,d,e or j)

<sup>1</sup> FSO: Swiss Federal Statistical Office

No	A Category/Entry*	B Criterion for plausibility	C Correction
10	2102(a,b) to 2104(a,b)	2 entries in 2102(a,b)	50% of the heifers3yr were assigned to each of the type of housing TiedHousingSlurry (2102(a)) and TiedHousingLiquidSolid (2102(b)), respectively  Idem for 2103(a,b) and 2104(a,b)
11	2102(a or b) and 2102(c,d,e or j) to 2104(a or b) and 2104(c,d,e or j)	2 entries in 2102(a or b) and 2102(c,d,e or j)	100% of the heifers1yr, heifers2yr, heifers3yr were assigned to 2102(c,d,e or j)  Idem for 2103(a or b) and 2103(c,d,e or j), and 2104(a or b) and 2104(c,d,e or j)
12	2102(c,d,e or j) to 2104(c,d,e or j)	2 entries in 2102 (c,d,e or j)	50% of the heifers3yr were assigned to the entered type of housing LooseHousingSlurry (2102(c)), LooseHousingLiquidSolid (2102(d or e)) or LooseHousingDeepLitter (2102(j)) and 50% to the other entered type of housing, respectively.  Idem for 2103(c,d,e or j) and 2104(c,d,e or j)
13	2102(a and/or b) and 2102(c,d,e and/or j) to 2104(a and/or b) and 2104(c,d,e and/or j)	More than two entries in 2102(a and/or b) and 2102(c,d,e and/or j)	100% of the heifers3yr were assigned to the type of housing LooseHousingLiquidSolid (2102(d)).  Idem for 2103(a and/or b) and 2103(c,d,e and/or j) and 2104(a and/or b), and 2104(c,d,e and/or j)
14	2102(c,d,e or j) to 2104(c,d,e or j)	More than 2 entries in 2102(c,d,e or j)	50% of the heifers1yr, heifers2yr, heifers3yr were assigned to the entered type of housing LooseHousingSlurry (2102(c)) and 50 % to the type of housing LooseHousingLiquidSolid (2102(d)), respectively.  Idem for 2103(c,d,e or j) and 2104(c,d,e or j)
15	2102(a,b,c,d,e and j) to 2104(a,b,c,d,e and j)	If a farm includes heifers1yr, heifers2yr, heifers3yr according to the statistical data of the FSO and has exclusively dairy cows or suckling cows and dairy cows or exclusively heifers and an entry in 2102(a,b,c,d,e and j) is missing.	50% of the heifers3yr were assigned to the type of housing LooseHousingSlurry (2102(c)), and 50% to the type of housing LooseHousingLiquidSolid (2102(d)), respectively.  Idem for 2103(a,b,c,d,e and j) and 2104(a,b,c,d,e and j)

No	A Category/Entry*	B Criterion for plausibility	C Correction
16	2102(a,b,c,d,e and j) to 2104(a,b,c,d,e and j)	If a farm includes heifers1yr, heifers2yr, heifers3yr according to the statistical data of the FSO and has exclusively suckling cows and an entry in 2102 (a,b,c,d,e and j) is missing.	The type of housing given for suckling cows is assigned to the type of housing for the heifers3yr. Idem for 2103(a,b,c,d,e and j) and 2104(a,b,c,d,e and j)
17	2105(a,b,c,d,e and j)	If a questionnaire includes 2 entries or more for the type of housing systems for suckling cows 2105(a,b,c,d,e or j)	The maximum number of housing types for modelling in Agrammon was set to 2
18	2105(a,b)	2 entries in 2105a and b	50% of the suckling cows were assigned to each of the type of housing TiedHousingSlurry (2105(a)) and TiedHousingLiquidSolid (2105(b)), respectively.
19	2105(a or b) and 2105(c,d,e or j)	2 entries in 2105(a or b) and 2105(c,d,e or j)	25% of the suckling cows were assigned to the entered type of housing TiedHousingSlurry (2105(a)) or TiedHousingLiquidSolid (2105(b)) and 75% to the entered type of housing LooseHousingSlurry (2105(c)), LooseHousingLiquidSolid (2105(d or e)) or LooseHousingDeepLitter (2105(j)), respectively.
20	2105(c,d,e or j)	2 entries in 2105(c,d,e or j)	50% of the suckling cows were assigned to the entered type of housing LooseHousingSlurry (2105(c)), LooseHousingLiquidSolid (2105(d or e)) or LooseHousingDeepLitter (2105(j)) and 50% to the other entered type of housing, respectively.
21	2105(a and/or b) and 2105(c,d,e and/or j)	More than two entries in 2105(a and/or b) and 2105(c,d,e and/or j)	25% of the suckling cows were assigned to the type of housing TiedHousingLiquidSolid (2105(b)) and 75 % to LooseHousingLiquidSolid (2105(d)), respectively.
22	2105(c,d,e or j)	More than two entries in 2105(c,d,e or j)	50% of the suckling cows were assigned to the type of housing LooseHousingSlurry (2105(c)) and 50% to the type of housing LooseHousingLiquidSolid (2105(d))
23	2105(a,b,c,d,e and j)	If a farm includes suckling cows according to the statistical data of the FSO and an entry for the housing system is missing	Missing entries were corrected as follows: the distribution of TiedHousing types and LooseHousing types was calculated for each farm class. The calculated distribution was applied to the housing types TiedHousingLiquidSolid (2105(b)) and to LooseHousingLiquidSolid (2105(d)), respectively.

No	A Category/Entry*	B Criterion for plausibility	C Correction
24	2106(a,b,c,d,e,i and j)	If a questionnaire includes 2 entries or more for the type of housing systems for beef cattle 2106(a,b,c,d,e or j)	The maximum number of housing types for modelling in Agrammon was set to 2
25	2106(a,b)	2 entries in 2106(a,b)	50% of the beef cattle were assigned to each of the type of housing TiedHousingSlurry (2106(a)) and TiedHousingLiquidSolid (2106(b)), respectively
26	2106(a or b) and 2106(c,d,e,i or j)	2 entries in 2106(a or b) and 2106(c,d,e,i or j)	100% of the beef cattle were assigned to 2106(c,d,e,i or j)
27	2106(c,d,e,i or j)	2 entries in 2106(c,d,e,i or j)	50% of the beef cattle were assigned to the entered type of housing LooseHousingSlurry (2106(c or i)), LooseHousingLiquidSolid (2106(d or e)) or LooseHousingDeepLitter (2106(j)) and 50% to the other entered type of housing, respectively.
28	2106(a and/or b) and 2106(c,d,e,i and/or j)	More than two entries in 2106(a and/or b) and 2106(c,d,e,i and/or j)	100% of the beef cattle were assigned to the type of housing LooseHousingLiquidSolid (2106(d)).
29	2106(c,d,e,i or j)	More than 2 entries in 2106(c,d,e,i or j)	50% of the beef cattle were assigned to the type of housing LooseHousingSlurry (2106(c or i)) and 50 % to the type of housing LooseHousingLiquidSolid (2106(d)), respectively.
30	2106(a,b,c,d,e,i and j)	If a farm includes beef cattle according to the statistical data of the FSO and an entry for 2106(a,b,c,d,e,i and j) is missing.	50% of the beef cattle were assigned to the type of housing LooseHousingSlurry (2106(c or i)), and 50% to the type of housing LooseHousingLiquidSolid (2106(d)), respectively.
31	2107(a,b,c,d,e and j)	If a questionnaire includes 2 entries or more for the type of housing systems for beef calves 2107(c,d,e or j)	The maximum number of housing types for modelling in Agrammon was set to 2
32	2107(c,d,e or j)	2 entries in 2107(c,d,e or j)	50% of the beef calves were assigned to the entered type of housing LooseHousingSlurry (2107(c)), LooseHousingLiquidSolid (2107(d or e)) or LooseHousingDeepLitter (2107(j)) and 50% to the other entered type of housing, respectively.

No	A Category/Entry*	B Criterion for plausibility	C Correction
33	2107c,(d,e or j)	More than 2 entries in 2107(c,d,e or j)	50% of the beef calves were assigned to the type of housing LooseHousingLiquidSolid (2107(d)) and 50 % to the type of housing LooseHousingDeepLitter (2107(j)), respectively.
34	2107(a,b,c,d,e and j)	If a farm includes beef calves according to the statistical data of the FSO and an entry for 2107(c,d,e and j) is missing.	50% of the beef calves were assigned to the type of housing LooseHousingLiquidSolid (2107(d)) and 50 % to the type of housing LooseHousingDeepLitter (2107(j)), respectively.
35	2202(a,b,c and d)		Entries are used as input data for loose housing systems only
36	2203(a,b,c,d and e)	2 entries or more in 2203(a,b,c,d and e).	Calculate the average of all values (a: 5000; b: 6000; c: 7000; d: 8000; e: 9000)
37	2203(a,b,c,d and e)	If the number of number of dairy cows is >0 and an entry in 2203(a,b,c,d and e) is missing.	a) Calculation of the average milk yield per cow: (amount of commercialized milk volume according to FSO / number of dairy cows (i.e. $x_{1111} + x_{1112}^2$ ))+200 <sup>3</sup> b) If the calculated milk yield (see a) was higher than 10'000, it was replaced by 6800 <sup>4</sup> . c) If the milk yield determined (see b) was lower than 4500, it was replaced by 6000
38	2301(a,d,e and f) to 2307(a,d,e and f)	2 entries or more in 2301(a,d,e and f); if a farm includes the relevant cattle categories according to the statistical data of the FSO and an entry for the surface of the exercise yard is missing	The entries given for 2301(a,d,e and f) were allocated as follows (the positions of 0 and 1 represent entries for a,d,e,f) 0,0,0,0 solid floor 1,0,0,0: paddock or pasture used as exercise yard 0,1,0,0: solid floor 0,0,1,0: perforated floor 0,0,0,1: unpaved floor

<sup>2</sup> Code for the animal category according to FSO.

<sup>3</sup> 200 is the amount of milk in liter assumed to be used for rearing calves and the use in the household

<sup>4</sup> An average milk yield of ca. 6800 kg resulted from the total of entries in 2203(a,b,c,d and e). This amount seemed to be plausible as compared to the average milk yield based on the evaluation of the milk yield surveys from cows of the herd book dairy cows of the 3 major breeding associations.

No	A Category/Entry*	B Criterion for plausibility	C Correction
39	2301(a,d,e and f) to 2307(a,d,e and f)		1,1,0,0: solid floor 0,1,1,0: solid floor 0,0,1,1: perforated floor 1,0,0,1: paddock or pasture used as exercise yard 1,0,1,0: perforated floor 0,1,0,1: solid floor 1,1,1,0: solid floor 0,1,1,1: solid floor 1,0,1,1: perforated 1,1,0,1: solid floor 1,1,1,1: solid floor Idem for 2302(a,d,e and f) to 2307(a,d,e and f).
40	2301(g and h), 2401(a and b) to 2307(g and h), 2407(a and b)	Allocation to the following categories for loose housing systems (i.e. the animals have constantly free access to an exercise yard): -'no feeding' of roughage in the exercise yard, duration of exercise utilization per day: 1-2 h; 10% of excretion in the exercise yard -'partly feeding' of roughage in the exercise yard, duration of exercise utilization per day: 3-4 h; 20% of excretion in the exercise yard -'fully feeding' of roughage in the exercise yard, duration of exercise utilization per day: >10 h; 60% of excretion in the exercise yard	The entries given for 2301(g and h), 2401(a and b) were allocated as follows (position of 0 and 1 represent entries for g,h,a,b; g,h, for 2301(g and h); a,b for 2401(a and b), 0000: partly feeding 1000: partly feeding 0010: partly feeding 0001: partly feeding 1100: partly feeding 0011: partly feeding 1010: partly feeding 1110: partly feeding 1011: partly feeding 1101: partly feeding 1111: partly feeding 0100: no feeding 0110: no feeding 0101: no feeding 0111: no feeding 1001: fully feeding Idem for 2301(g and h), 2401(a and b) to 2307(g and h), 2407(a and b)

No	A Category/Entry*	B Criterion for plausibility	C Correction
41	2301(g and h), 2401(a and b) to 2307(g and h), 2407(a and b)	Allocation to the following categories for tied housing systems (i.e. access to an exercise yard for the animals is required): -‘no feeding’ of roughage in the exercise yard, duration of exercise utilization per day: 1-2 h; 10% of excretion in the exercise yard -‘partly feeding’ of roughage in the exercise yard, duration of exercise utilization per day: 3-4 h; 20% of excretion in the exercise yard	The entries given for 2301(g and h), 2401(a and b) were allocated as follows (position of 0 and 1 represent entries for g,h,a,b; g,h, for 2301(g and h); a,b for 2401(a and b), 0000: partly feeding 1000: partly feeding 0010: partly feeding 0001: partly feeding 1100: partly feeding 0011: partly feeding 1010: partly feeding 1110: partly feeding 1011: partly feeding 1101: partly feeding 1111: partly feeding 0100: no feeding 0110: no feeding 0101: no feeding 0111: no feeding 1001: partly feeding Idem for 2301(g and h), 2401(a and b) to 2305(g and h), 2405(a and b)
42	2401(c,d,e,f and g) to 2407(c,d,e,f and g)	2 entries in 2401(c,d,e,f and g)	Calculate the average of both values (c: 30; d: 60; e: 115; f: 200; g: 300) Idem for entries 2402(c,d,e,f and g) to 2407(c,d,e,f and g)
43	2401(c,d,e,f and g) to 2407(c,d,e,f and g)	If a farm includes the relevant cattle categories according to the statistical data of the FSO, has a tied housing system and an entry for 2401(c,d,e,f and g) is missing	The following default value was entered: 60 Idem for entries 2402(c,d,e,f and g) to 2407(c,d,e,f and g)

No	A Category/Entry*	B Criterion for plausibility	C Correction
44	2401(c,d,e,f and g) to 2405(c,d,e,f and g)	If a farm includes the relevant cattle categories according to the statistical data of the FSO, has a loose housing system, and an entry for 2401(c,d,e,f and g) is missing	For loose housing systems, the following default value was entered: 300 Idem for entries 2402(c,d,e,f and g) to 2405(c,d,e,f and g)
45	2406(c,d,e,f and g) to 2407(c,d,e,f and g)	If a farm participating in the Raus, or BTS/Raus program includes the relevant cattle categories according to the statistical data of the FSO, has a loose housing system, and an entry for 2406(c,d,e,f and g) is missing	For loose housing systems, the following default value was entered: 300 Idem for entries 2407(c,d,e,f and g)
46	2406(c,d,e,f and g) to 2407(c,d,e,f and g)	If a farm not participating in the Raus, or BTS/Raus program includes the relevant cattle categories according to the statistical data of the FSO, has a loose housing system, and an entry for 2406(c,d,e,f and g) is missing	For loose housing systems, the following default value was entered: 0 Idem for entries 2407(c,d,e,f and g)
47	2501(a,b,c,d and e) to 2503(a,b,c,d and e)	2 entries in 2501(a,b,c,d and e)	Calculate the average of both values (a: 0; b: 1; c: 4; d: 9; e: 18) Idem for entries 2502(a,b,c,d and e) and 2503(a,b,c,d and e)
48	2501(a,b,c,d and e) to 2503(a,b,c,d and e)	If a farm includes the relevant horse categories according to the statistical data of the FSO and an entry for 2501(a,b,c,d and e) is missing	The following default value was entered: 9 Idem for entries 2502(a,b,c,d and e) and 2503(a,b,c,d and e)

No	A Category/Entry*	B Criterion for plausibility	C Correction
49	2501(f,g,h,i and j) to 2503(f,g,h,i and j)	2 entries in 2501(f,g,h,i and j)	Calculate the average of both values (f: 30; g:60; h: 115; ,i: 200; j: 300) Idem for entries 2502(a,b,c,d and e) and 2503(a,b,c,d and e)
50	2501(f,g,h,i and j) to 2503(f,g,h,i and j)	If a farm includes the relevant horse categories according to the statistical data of the FSO and an entry for 2501(f,g,h,i and j) is missing	The following default value was entered: 115 Idem for entries 2502(a,b,c,d and e) and 2503(a,b,c,d and e)
51	2601(a,b,c,d and e) to 2613(a,b,c,d and e)	2 entries in 2601(a,b,c,d and e)	Calculate the average of both values (a: 0; b: 3; c: 8.5; d: 17; e: 24) Idem for entries 2602(a,b,c,d and e) to 2613(a,b,c,d and e)
52	2601(f,g,h,i and j) to 2607(f,g,h,i and j)	2 entries in 2601(f,g,h,i and j)	Calculate the average of both values (f: 30; g:60; h: default values as given in cell C58; i: 250; j: 250) Idem for entries 2602(f,g,h,i and j) to 2607(f,g,h,i and j)
53	2608(f,g,h,i and j) to 2613(f,g,h,i and j)	2 entries in 2608(f,g,h,i and j)	Calculate the average of both values (f: 30; g:60; h: 180; i: 280; j: 350) Idem for entries 2608(f,g,h,i and j) to 2613(f,g,h,i and j)
54	2601(a,b,c,d and e) and 2605(a,b,c,d and e), to 2613(f,g,h,i and j) and 2601(f,g,h,i and j) and 2605(f,g,h,i and j) to 2613(f,g,h,i and j)	If a farm includes the relevant livestock categories according to the statistical data of the FSO and an entry for both 2601(a,b,c,d and e) and 2601(f,g,h,i and j) is missing	The following value was entered: 2601(a,b,c,d and e)=0; 2601(f,g,h,i and j)=0 <sup>5</sup> Idem for entries 2605(a,b,c,d and e) to 2613(a,b,c,d and e) Idem for entries 2605(f,g,h,i and j) to 2613(f,g,h,i and j)

<sup>5</sup> It was assumed that the relevant livestock categories have no access to a pasture

No	A Category/Entry*	B Criterion for plausibility	C Correction
55	2602(a,b,c,d and e) to 2604(a,b,c,d and e), 2602(f,g,h,i and j) to 2604(f,g,h,i and j)	If a farm includes the relevant livestock categories according to the statistical data of the FSO, has dairy cows, dairy cows and suckling cows or exclusively heifers and an entry for both 2602(a,b,c,d and e) and 2602(f,g,h,i and j) is missing	The following values were entered: 2602(a,b,c,d and e)=0; 2602(f,g,h,i and j)=0 <sup>5</sup>  Idem for entries 2603(a,b,c,d and e) to 2604(a,b,c,d and e) Idem for entries 2603(f,g,h,i and j) to 2604(f,g,h,i and j)
56	2602(a,b,c,d and e) to 2604(a,b,c,d and e), 2602(f,g,h,i and j) to 2604(f,g,h,i and j)	If a farm includes the relevant livestock categories according to the statistical data of the FSO, has exclusively suckling cows and an entry for both 2602(a,b,c,d and e) and 2602(f,g,h,i and j) is missing	The values given for 2605(a,b,c,d and e) and 2605(f,g,h,i and j), respectively, were entered.  Idem for entries 2603(a,b,c,d and e) to 2604(a,b,c,d and e) Idem for entries 2603(f,g,h,i and j) to 2604(f,g,h,i and j)
57	2601(a,b,c,d and e) to 2613(a,b,c,d and e)	If a farm includes the relevant livestock categories according to the statistical data of the FSO and an entry for 2601(a,b,c,d and e) is missing and an entry for 2601(f,g,h,i and j) is given.	The following default value was entered: 8.5  Idem for entries 2602(a,b,c,d and e) to 2613(a,b,c,d and e)
58	2601(f,g,h,i and j) to 2613(f,g,h,i and j)	If a farm includes the relevant livestock categories according to the statistical data of the FSO and an entry for 2601(f,g,h,i and j) is missing and an entry for 2601(a,b,c,d and e) is given.	The following default values were entered: Valley zone (VIKA 11, 21, 22): 190 days Hill zone (VIKA 41, 51): 180 days Mountain zone (VIKA 52, 53, 54): 165 days Combined Hill Mountain zone: 172 days  Idem for entries 2602(f,g,h,i and j) to 2613(f,g,h,i and j)

No	A Category/Entry*	B Criterion for plausibility	C Correction
59	2401(c,d,e,f and g) to 2407(c,d,e,f and g), 2601(f,g,h,i and j) to 2607(f,g,h,i and j)	If the sum of 2401(c,d,e,f and g) + 2601(f,g,h,i and j) is greater than 365 and the relevant livestock is kept in a loose housing system	A number greater than 365 can be applied (i.e. no correction required) Idem for entries 2402(c,d,e,f and g) to 2407(c,d,e,f and g) Idem for entries 2602(f,g,h,i and j) to 2607(f,g,h,i and j)
60	2401(c,d,e,f and g) to 2407(c,d,e,f and g), 2601(f,g,h,i and j) to 2607(f,g,h,i and j)	If the sum of 2401(c,d,e,f and g) + 2601(f,g,h,i and j) is greater than 365 and the relevant livestock is kept in a tied housing system or if the relevant livestock is kept in a loose housing system and 2301a is given.	The total is corrected to 365 by subtraction of the number of days exceeding 365 from 2401(c,d,e,f and g). Idem for entries 2402(c,d,e,f and g) to 2407(c,d,e,f and g) Idem for entries 2602(f,g,h,i and j) to 2607(f,g,h,i and j)
61	2501(f,g,h,i and j) to 2503(f,g,h,i and j), 2608(f,g,h,i and j) to 2610(f,g,h,i and j)	If the sum of 2501(f,g,h,i and j) + 2608(f,g,h,i and j) is greater than 365	A number greater than 365 can be applied (i.e. no correction required) Idem for entries 2502(f,g,h,i and j) and 2503(f,g,h,i and j) Idem for entries 2609(f,g,h,i and j) and 2610(f,g,h,i and j)
62	2711(a,b,c,d and e)	2 entries or missing entry for 2711(a,b,c,d and e)	No correction is needed
63	2712(a,b,c,d and e)	2 entries or missing entry for 2712(a,b,c,d and e)	No correction is needed
64	2721(a,b,c,d and e)	2 entries in 2721(a,b,c,d and e)	Calculate the average of both values (a: 0.5; b: 1.5; c: 2.5; d: 4; e: 6)
65	2721(a,b,c,d and e)	If a farm includes dairy cattle according to the statistical data of the FSO and entries for both 2721(a,b,c,d and e) and 2722(a,b,c,d and e) are missing	The following default value was entered: 1

No	A Category/Entry*	B Criterion for plausibility	C Correction
66	2722(a,b,c,d and e)	2 entries in 2722(a,b,c,d and e)	Calculate the average of both values (a: 0.5; b: 1.5; c: 2.5; d: 4; e: 6)
67	2722(a,b,c,d and e)	If a farm includes dairy cattle according to the statistical data of the FSO and entries for both 2721(a,b,c,d and e) 2722(a,b,c,d and e) are missing	The following default value was entered: 2
68	2721(a,b,c,d and e)	If a farm includes dairy cattle according to the statistical data of the FSO and an entry for 2721(a,b,c,d and e) is missing and an entry for 2722(a,b,c,d and e) is given	The following default value was entered for 2721: 0.5 <sup>6</sup>
69	2722(a,b,c,d and e)	If a farm includes dairy cattle according to the statistical data of the FSO and an entry for 2721(a,b,c,d and e) is given and an entry for 2722(a,b,c,d and e) is missing	The following default value was entered for 2722: 0.5 <sup>6</sup>
70	3101(b,c,d,e and f) to 3103(b,c,d,e and f)	Allocation to the following housing systems for the relevant pig categories: SlurryConventional, SlurryLabel, Deeplitter, OutdoorLabel	
71	3101(b,c,d,e and f) to 3103(b,c,d,e and f)	1 entry in 3101(b,c,d,e and f)	SlurryConventional: 1 entry in either 3101b or 3101c and 1 entry in 3101f SlurryLabel: 1 entry in either 3101b or 3101c or 3101d and no entry in 3101f Deeplitter: 1 entry in each 3101d and 3101f OutdoorLabel: 1 entry in 3101e Idem for entries 3102(b,c,d,e and f) and 3103(b,c,d,e and f)

<sup>6</sup> It is considered as equally possible that no concentrates are fed and that the entry was erroneously not entered; therefore, the minimum value 'a' (0.5) is entered

No	A Category/Entry*	B Criterion for plausibility	C Correction
72	3101(b,c,d,e and f) to 3103(b,c,d,e and f)	2 to 3 entries in 3101(b, c, d and e)	Slurry conventional: for all possible combinations of 3101(b,c and d) if no entry in 3101e and/or 1 entry in 3101f SlurryLabel: for all possible combinations of 3101(b,c,d and e) and no entry in 3101f Idem for entries 3102(b,c,d,e and f) and 3103(b,c,d,e and f)
73	3101(b,c,d,e and f) to 3103(b,c,d,e and f)	If a farm includes the relevant pig categories according to the statistical data of the FSO and an entry for 3101(b,c,d,e and f) is missing	The following default value was entered for piglets and nursing sows: SlurryConventional The following default value was entered for dry sows: SlurryLabel
74	3104(a,b,c,d,e and f)	Allocation to the following housing systems for fattening pigs: SlurryConventional, SlurryLabel, Deeplitter, OutdoorLabel	
75	3104(a,b,c,d,e and f)	1 entry in 3104(a,b,c,d,e and f)	SlurryConventional: 1 entry in either 3104b or 3104c and 1 entry in 3104f or 1 entry in 3104a independent from the entry in 3104f SlurryLabel: 1 entry in either 3104b or 3104c or 3104d no entry in 3104f Deeplitter: 1 entry in 3104d and 3104f OutdoorLabel: 1 entry in 3104e
76	3104(a,b,c,d,e and f)	2 to 3 entries in 3104(a,b,c,d,e and f)	Slurry conventional: for all possible combinations of 3104(a,b,c and d) if no entry in 3104e and/or 1 entry in 3104f SlurryLabel: for all possible combinations of 3104(b,c,d and e) and no entry in 3104f

No	A Category/Entry*	B Criterion for plausibility	C Correction
77	3104(a,b,c,d,e and f)	If a farm includes the relevant pig categories according to the statistical data of the FSO and an entry for 3104(a,b,c,d,e and f) is missing	The following default value was entered: SlurryLabel
78	3101(b,c and d) to 3104(a,b,c and d)	Production of solid manure	For all housing systems, production of solid manure is set to 0% <sup>7</sup> except for Deepitter (production of solid manure = 100%).
79	3301(a,b and c)	2 entries in 3301(a,b and c) <sup>8</sup>	Calculate the average of both values (a: 14; b: 15; c: 16)
80	3301(a,b and c)	If a farm includes dry sows according to the statistical data of the FSO and an entry 3301(a,b and c) is missing	The following default value was entered: 14.5
81	3202(a,b,c,d,e and f)	2 entries in 3302(a,b,c,d,e and f) <sup>8</sup>	Calculate the average of both values (a: 14; b: 15; c: 16; d: 17; e: 18; f: 19)
82	3302(a,b,c,d,e and f)	If a farm includes nursing sows according to the statistical data of the FSO and an entry 3302(a,b,c,d,e and f) is missing	The following default values was entered: 16.5
83	3303(a,b,c,d,e and f)	2 entries in 3303(a,b,c,d,e and f) <sup>9</sup>	Calculate the average of both values (a: 14; b: 15; c: 16; d: 17; e: 18; f: 19)
84	3303(a,b,c,d,e and f)	If a farm includes piglets according to the statistical data of the FSO and an entry 3303(a,b,c,d,e and f) is missing	The following default values was entered: 18
85	3401(a,b,c,d,e and f) to 3403(a,b,c,d,e and f)	2 entries in 3401(a,b,c,d,e and f) <sup>9</sup>	Calculate the average of both values (a: 14; b: 15; c: 16; d: 17; e: 18; f: 19) Idem for entries 3402(a,b,c,d,e and f) and 3403(a,b,c,d,e and f)

<sup>7</sup> For systems 'b' and 'c' the percentage of solid manure produced would be 5% and might reach up to 15% for system 'd'. The simplification chosen seems to be reasonable.

<sup>8</sup> More than 2 entries do not occur

<sup>9</sup> More than 2 entries do not occur

No	A Category/Entry*	B Criterion for plausibility	C Correction
86	3401(a,b,c,d,e and f) to 3403(a,b,c,d,e and f)	If a farm includes fattening pigs according to the statistical data of the FSO and an entry 3401(a,b,c,d,e and f) is missing	The following default value was entered for 3401 (i.e. feeding method assumed: one-phase feeding): 17
87	3401(a,b,c,d,e and f) to 3403(a,b,c,d,e and f)	1 entry in either 3401(a,b,c,d,e and f), 3402(a,b,c,d,e and f) or 3403(a,b,c,d,e and f)	Feeding method assumed: one-phase feeding
88	3401(a,b,c,d,e and f) to 3403(a,b,c,d,e and f)	1 entry in either 3401(a,b,c,d,e and f) and 3402(a,b,c,d,e and f) each, or 1 entry in either 3401(a,b,c,d,e and f) and 3403(a,b,c,d,e and f) each or 1 entry in either 3402(a,b,c,d,e and f) and 3403(a,b,c,d,e and f)	Feeding method assumed: two-phase feeding under the condition that the crude protein content entered for phase 1 is higher or equal than the crude protein content entered for phase 2. For datasets with higher CP content in the subsequent phase, the following default value was entered: 17 and the feeding method assumed was one-phase feeding.
89	3401(a,b,c,d,e and f) to 3403(a,b,c,d,e and f)	1 entry in each 3401(a,b,c,d,e and f), 3402(a,b,c,d,e and f) and 3403(a,b,c,d,e and f), respectively	Feeding method assumed: three-phase feeding under the condition that the crude protein content entered for phase 1 is higher or equal than the crude protein content entered for phase 2 and that the crude protein content entered for phase 2 is higher or equal than the crude protein content entered for phase 3. For datasets with higher CP content in the subsequent phase, the following default value was entered: 17 and the feeding method assumed was one-phase feeding.
90	4101(a,b and c)	If a farm includes less than 500 poultry growers according to the statistical data of the FSO	The following default values was entered (independent from the entries in 4101(a,b and c): DeepLitter
91	4101(a,b and c)	1 entry in 4101(a) and 1 entry in either 4101(b or c) or an entry in 4101(a,b and c), is missing and the farm includes 500 poultry growers or more according to the statistical data of the FSO	100% of the poultry growers were assigned to the type of housing ManureBelt (4101(a)).

No	A Category/Entry*	B Criterion for plausibility	C Correction
92	4101(a,b and c)	No entry in 4101(a) and 2 entries in 4101(b and c)	The following default values was entered: DeepLitter
93	4101(a,b and c)	3 entries in 4101(a,b and c) and the farm includes 500 poultry growers or more according to the statistical data of the FSO	100% of the poultry growers were assigned to the type of housing ManureBelt (4101(a)).
94	4101(a,b and c)	If a farm includes less than 50 poultry growers according to the statistical data of the FSO and an entry for 4101(a,b and c) is missing	The following default values was entered: DeepLitter
95	4101(e)	If a farm includes less than 50 poultry growers according to the statistical data of the FSO and an entry for 4101(e,f) is missing or one entry is given in each 4101(e) and 4101(f)	The following default value was entered: freeRange
96	4101(e)	If a farm includes 50 poultry growers or more according to the statistical data of the FSO and an entry for 4101(e,f) is missing or one entry is given in each 4101(e) and 4101(f)	If the farm participates in the program RAUS or BTS RAUS according to the data of the FOA the following default value was entered: freeRange.
97	4101(e)	If a farm includes 50 poultry growers or more according to the statistical data of the FSO and an entry for 4101(e,f) is missing or one entry is given in each 4101(e) and 4101(f)	If the farm does not participate in the program RAUS or BTS RAUS according to the data of the FOA the following default value was entered: no freeRange.

No	A Category/Entry*	B Criterion for plausibility	C Correction
98	4101(e)	If a farm includes 50 poultry growers or more according to the statistical data of the FSO and an entry for 4101(e) is given	If the farm does not participate in the program RAUS or BTS RAUS according to the data of the FOA the following default value was entered: freeRange.
99	4101(f)	If a farm includes poultry growers according to the statistical data of the FSO and an entry for 4101(f) is given	The following default value was entered independent from other data or entries: no freeRange.
100	4101(i)	If a farm includes poultry growers according to the statistical data of the FSO and an entry for 4101(i) is missing	The following default value was entered: none.
101	4101(j and k)	2 entries in 4101(j and k) or if a farm includes poultry growers according to the statistical data of the FSO and an entry for 4101(j and k) is missing	The following default value was entered: bell drinker
102	4102(a,b and c), 4105(a,b and c)	If a farm includes less than 500 layers/other poultry according to the statistical data of the FSO	The following default values was entered (independent from the entries in 4102(a,b and c): DeepLitter Idem for 4105(a,b and c)
103	4102(a,b and c), 4105(a,b and c)	1 entry in 4102(a) and 1 entry in either 4102(b or c) or an entry in 4102(a,b and c) is missing and the farm includes 500 layers/other poultry or more according to the statistical data of the FSO	100% of the layers were assigned to the type of housing ManureBelt. (4102(a)). Idem for 4105(a,b and c)
104	4102(a,b and c), 4105(a,b and c)	No entry in 4102(a) and 2 entries in either 4102(b and c)	The following default values was entered: DeepLitter Idem for 4105(a,b and c)

No	A Category/Entry*	B Criterion for plausibility	C Correction
105	4102(a,b and c), 4105(a,b and c)	3 entries in 4102(a,b and c) and the farm includes 500 layers/other poultry or more according to the statistical data of the FSO	100% of the layers were assigned to the type of housing ManureBelt. Idem for 4105(a,b and c)
106	4102(a,b and c), 4105(a,b and c)	If a farm includes less than 50 layers/other poultry according to the statistical data of the FSO and an entry for 4102(a,b and c) is missing	The following default values was entered: DeepLitter Idem for 4105(a,b and c)
107	4102(e), 4105(e)	If a farm includes less than 50 animals according to the statistical data of the FSO and an entry for 4102(e,f) is missing or one entry is given in each 4102(e) and 4102(f)	The following default value was entered: freeRange Idem for 4105(e)
108	4102(e), 4105(e)	If a farm includes 50 animals or more according to the statistical data of the FSO and an entry for 4101(e,f) is missing or one entry is given in each 4102(e) and 4102(f)	If the farm participates in the program RAUS or BTS RAUS according to the data of the FOA the following default value was entered: freeRange. Idem for 4105(e)
109	4102(e) 4105(e)	If a farm includes 50 animals or more animals according to the statistical data of the FSO and an entry for 4102(e,f) is missing or one entry is given in each 4102(e) and 4102(f)	If the farm does not participate in the program RAUS or BTS RAUS according to the data of the FOA the following default value was entered: no freeRange. Idem for 4105(e)
110	4102(e) 4105(e)	If a farm includes 50 animals or more according to the statistical data of the FSO and an entry for 4102(e) is given	If the farm does not participate in the program RAUS or BTS RAUS according to the data of the FOA the following default value was entered: freeRange. Idem for 4105(e)

No	A Category/Entry*	B Criterion for plausibility	C Correction
111	4102(f) 4105(f)	If a farm includes animals according to the statistical data of the FSO and an entry for 4102(f) is given	The following default value was entered independent from other data or entries: no freeRange. Idem for 4105(f)
112	4102(i), 4105(i)	If a farm includes animals according to the statistical data of the FSO and an entry for 4101(i) is missing	The following default value was entered: none. Idem for 4105(i)
113	4102(j and k), 4105(j and k)	2 entries in 4102(j and k) or if a farm includes layers/other poultry according to the statistical data of the FSO and an entry for 4102(j and k) is missing	The following default value was entered: bell drinker Idem for 4105(j and k)
114	4103(e), 4104(e)	If a farm includes less than 50 animals according to the statistical data of the FSO and an entry for 4103(e,f) is missing or one entry is given in each 4103(e) and 4103(f)	The following default value was entered: freeRange Idem for 4104(e)
115	4103(e), 4104(e)	If a farm includes 50 animals or more according to the statistical data of the FSO and an entry for 4103(e,f) is missing or one entry is given in each 4103(e) and 4103(f)	If the farm participates in the program RAUS or BTS RAUS according to the data of the FOA the following default value was entered: freeRange. Idem for 4104(e)
116	4103(e), 4104(e)	If a farm includes 50 animals or more according to the statistical data of the FSO and an entry for 4103(e,f) is missing or one entry is given in each 4103(e) and 4103(f)	If the farm does not participate in the program RAUS or BTS RAUS according to the data of the FOA the following default value was entered: no freeRange. Idem for 4104(e)

No	A Category/Entry*	B Criterion for plausibility	C Correction
117	4103(e), 4104(e)	If a farm includes 50 animals or more according to the statistical data of the FSO and an entry for 4103(e) is given	If the farm does not participate in the program RAUS or BTS RAUS according to the data of the FOA the following default value was entered: freeRange.  Idem for 4104(e)
118	4103(f), 4104(f)	If a farm includes animals according to the statistical data of the FSO and an entry for 4103(f) is given	The following default value was entered independent from other data or entries: no freeRange.  Idem for 4104(f)
119	4103(i), 4104(i)	If a farm includes animals according to the statistical data of the FSO and an entry for 4103(i) is missing	The following default value was entered: none.  Idem for 4104(i)
120	4103(j and k), 4104(j and k)	2 entries in 4103(j and k) or if a farm includes broilers/turkeys according to the statistical data of the FSO and an entry for 4103(j and k) is missing	The following default value was entered: bell drinker  Idem for 4104(j and k)
121	4201(a, b, c and d), 4202(a, b, c and d)	If a farm has a manure belt system according to entries in 4101(a) or 4202(a), respectively, and an entry for the collection frequency of the manure belt is missing or more than one entry is given in 4201(a, b, c and d) and 4202(a, b, c and d), respectively	The following default value was entered: 2 times per month

No	A Category/Entry*	B Criterion for plausibility	C Correction
122	6101(a and b) to 6103(a and b)	If a farm has a housing system for cattle producing slurry resulting from entries in 2101(a,b,c,d,e and j) to 2107(a,b,c,d,e and j) or a housing system for pigs producing slurry resulting from entries in 3101(b,c,d,e and f) to 3103(b,c,d,e and f) and 3104(a,b,c,d,e and f) and the relevant livestock categories according to the statistical data of the FSO an entry for 6101(a) is required	Idem for 6102(a) and 6103(a)
123	6101(a) to 6103(a)	If a farm has one or more housing systems producing slurry according to B122 and an entry for 6101(a) is missing or if a storage volume of 50% or less of the calculated slurry production is given, respectively.	The volume of the storage is calculated as follows: for each livestock category the slurry production is calculated based on the statistical data of the FSO for the number of livestock and on Fleisch et al. (2009) for slurry production. For systems producing slurry and slurry and solid manure the relevant figures are used; see Annex 1). A dilution factor of 1:1 and a duration required for storage of 5 months for altitude zone 1, 6 months for altitude zone 2, 7 months for altitude zone 3, 6.5 months for altitude zone 4 are assumed.  Idem for 6102(a) and 6103(a)
124	6101(a) to 6103(a)	If a farm has one or more housing systems producing slurry according to B122 and a storage volume of >2000 m <sup>3</sup> per store or if a storage volume exceeding by a factor of 2 or more of the calculated slurry production is given, respectively.	The volume of the storage of a factor of 1.5 of the calculated figure according to B123 is assumed.  Idem for 6102(a) and 6103(a)

No	A Category/Entry*	B Criterion for plausibility	C Correction
125	6101(b) to 6103(b)	If a farm has one or more housing systems producing slurry according to B122 and an entry for 6101(b) is missing or depth of a storage >6 m is given	The following default value was entered: 2.5 Idem for 6102(b) and 6103(b)
126	6101(b) to 6103(b)	If a farm has one or more housing systems producing slurry according to B122 and a depth of a storage of $\leq 0.4$ m is given.	The value given was multiplied by a factor of 10. Idem for 6102(b) and 6103(b)
127	6101(b) to 6103(b)	If a farm has one or more housing systems producing slurry according to B122 and a depth of a storage of higher than 0.4 m and lower than 1 m is given.	The following default value was entered: 2 Idem for 6102(b) and 6103(b)
128	6111(a,b,c,d,e and f) to 6113(a,b,c,d,e and f)	1 entry for 6111(e) and any other entry out of 6111(a,b,c,d and f)	Entry 6111(e) was ignored and the other entry out of 6111(a,b,c,d and f) was selected Idem for 6112(a,b,c,d,e and f) and 6113(a,b,c,d,e and f)
129	6111(a,b,c,d,e and f) to 6113(a,b,c,d,e and f)	2 entries out of 6111(a,b,c,d,e and f) except for 6111(e)	The higher frequency of both entries was selected (a: 365; b: 30; c: 18; d: 8; e: 8; f: 2) Idem for 6102(a,b,c,d,e and f) and 6103(a,b,c,d,e and f)
130	6111(a,b,c,d,e and f) to 6113(a,b,c,d,e and f)	If a farm has a storage for slurry according to B122 and an entry for 6111(a,b,c,d,e and f) is missing	The following default value was entered: 8 Idem for 6102(a,b,c,d,e and f) and 6103(a,b,c,d,e and f)
131	6121(a,b,c,d,e and f) to 6123(a,b,c,d,e and f)	If a farm has a storage for slurry according to B122 and an entry for 6121(a,b,c,d,e and f) is missing or if two entries are given	The following default value was entered: 1:1 Idem for 6122(a,b,c,d,e and f) and 6123(a,b,c,d,e and f)

No	A Category/Entry*	B Criterion for plausibility	C Correction
132	6121(a,b,c,d,e and f) to 6123(a,b,c,d,e and f)	Determination of one value for dilution if several storage tanks and different numbers for dilution (parts of water added to slurry) are given.	The average dilution level was calculated proportionally to the volumes of the storage tanks.
133	6141(a,b,c,d,e and f) to 6143(a,b,c,d,e and f)	If a farm has a storage for slurry according to B122 and an entry for 6141(a,b,c,d,e and f) is missing	The following default value was entered: 'uncovered' Idem for 6142(a,b,c,d,e and f) and 6143(a,b,c,d,e and f)
134	6141(a,b,c,d,e and f) to 6143(a,b,c,d,e and f)	More than one entry in 6141(b,c,d,e and f)	The value with the higher emission rate was entered according to the entry in 6141(b,c,d or e), 6141(f) was ignored (e.g.: 6141(b and f) gives 'solid cover', i.e. 6141(b); 6141(b,c and f) gives 'perforated', i.e. 6141(c) Idem for 6142(a,b,c,d,e and f) and 6143(a,b,c,d,e and f)
135	6141(a,b,c,d,e and f) to 6143(a,b,c,d,e and f)	Two entries in 6141(a and f) <sup>10</sup>	The following value was entered: 'natural crust' (i.e. 6141(f)) Idem for 6142(a,b,c,d,e and f) and 6143(a,b,c,d,e and f)
136	6141(a,b,c,d,e and f) to 6143(a,b,c,d,e and f)	Two entries in 6141(b and c)	The following value was entered: 'perforated' (i.e. 6141(c)) Idem for 6142(a,b,c,d,e and f) and 6143(a,b,c,d,e and f)

<sup>10</sup> A storage with a natural crust (6141(f)) was considered as an uncovered storage with a natural crust.

No	A Category/Entry*	B Criterion for plausibility	C Correction
137	6311(a and b) to 6331(a and b); 6312(a,b and c), to 6332(a,b and c)	If a farm has a housing system for cattle producing solid manure resulting from entries in 2101(a,b,c,d,e and j) to 2107(a,b,c,d,e and j) or a housing system for pigs producing solid manure resulting from entries in 3101(b,c,d,e and f) to 3103(b,c,d,e and f) and 3104(a,b,c,d,e and f) or poultry according to the statistical data of the FSO and poultry manure is not stored in a storage for liquid manure according to 6331(a), 6332(a) and 6333(a), an entry for 6311(a and b) and 6312(a,b and c), respectively, is required	Idem for 6321(a and b) and 6322(a,b and c); 6331(a and b) and 6332(a,b and c)
138	6311(a and b) to 6331(a and b)	If a farm has one or more housing systems producing solid manure according to B137 and for 6311(a and b) 2 entries are given	The following default value was entered: 'no' Idem for 6321(a and b) and 6331(a and b)
139	6311(a and b) to 6331(a and b)	If a farm has one or more housing systems producing solid manure according to B137 and for 6311(a and b) an entry is missing	The following default value was entered: 'yes' Idem for 6321(a and b) and 6331(a and b)
140	6312(a,b and c) to 6332(a,b and c)	If a farm has one or more housing systems producing solid manure according to B137, an entry is given for 6311(a) and 2 entries are given for 6312(a,b and c)	The average of both values was calculated (a: 10; b: 35; c: 75) Idem for 6322(a,b and c) and 6332(a,b and c)

No	A Category/Entry*	B Criterion for plausibility	C Correction
141	6312(a,b and c) to 6332(a,b and c)	If a farm has one or more housing systems producing solid manure according to B137 an entry is given for 6311(b) and an entry for 6312(a,b and c) is missing	The following default value was entered: 0 Idem for 6322(a,b and c) and 6332(a,b and c)
142	7121(a,b,c,d,e,f,g,h,i,j and k) to 7124(a,b,c,d,e,f,g,h,i,j and k)	If a farm has a storage for slurry according to B122 an entry for 7121(a,b,c,d,e,f,g,h,i,j and k) is required.	Idem for 7122(a,b,c,d,e,f,g,h,i,j and k) to 7124(a,b,c,d,e,f,g,h,i,j and k)
143	7121(a,b,c,d,e,f,g,h,i,j and k) to 7124(a,b,c,d,e,f,g,h,i,j and k)	More than one entry in 7121(a,b,c,d,e,f,g,h,i,j and k)	The average of both values was calculated (a: 0; b: 10; c: 20; d: 30; e: 40; f: 50; g: 60; h: 70; i: 80; j: 90; k: 100) Idem for 7122(a,b,c,d,e,f,g,h,i,j and k) to 7124(a,b,c,d,e,f,g,h,i,j and k)
144	7121(a,b,c,d,e,f,g,h,i,j and k) to 7124(a,b,c,d,e,f,g,h,i,j and k)	If a farm has a storage for slurry according to B122 and an entry for 7121(a,b,c,d,e,f,g,h,i,j and k), 7122(a,b,c,d,e,f,g,h,i,j and k), 7123(a,b,c,d,e,f,g,h,i,j and k) and 7124(a,b,c,d,e,f,g,h,i,j and k) is missing. This applies for all farms even for those with 0 ha agricultural surface.	The following default value was entered: 7121k (i.e. 100% splash plate)
145	7121(a,b,c,d,e,f,g,h,i,j and k) to 7124(a,b,c,d,e,f,g,h,i,j and k)	If a farm has a storage for slurry according to B122 and the entries for 7121(a,b,c,d,e,f,g,h,i,j and k) to 7124(a,b,c,d,e,f,g,h,i,j and k) do not add up to 100 % (missing entries are considered as 0)	For entries 7121(a,b,c,d,e,f,g and h) (i.e. <80%): the difference is added to 7121 (i.e. splash plate) For entries 7121(i,j and k) (i.e. 80%, 90%): the percentage is calculated proportionally up to 100%

No	A Category/Entry*	B Criterion for plausibility	C Correction
146	7141(a,b,c,d,e,f and g)	More than one entry in 7141(a,b,c,d,e,f and g)	2 entries: 50 % of the portion of solid manure was allocated to both entries 3 entries: 33.3 % of the portion of solid manure was allocated to the entries 4 entries: 25 % of the portion of solid manure was allocated to the entries
147	7141(a,b,c,d,e,f and g)	If a farm has one or more housing systems producing solid manure according to B137 and an entry for 7141(a,b,c,d,e,f and g) is missing. This applies for all farms even for those with 0 ha agricultural surface.	The following default value was entered: no incorporation
148	7201(a,b,c and d) to 7202(a,b,c and d)	If a farm has a storage for slurry according to B122 or produces solid manure and both of the entries for 7201(a,b,c and d) to 7202(a,b,c and d) are missing.	The following default values are entered: 50 % for application during summer (June to August) and 50 % for application during the rest of the year (September to Mai)
149	7201(a,b,c and d) to 7202(a,b,c and d)	If a farm has a storage for slurry according to B122 or produces solid manure and one of the entries for 7201(a,b,c and d) to 7202(a,b,c and d) is missing or the entries do not add up to 100%.	The values are corrected proportionally to the entries given in order to obtain a sum of 100 %.
150	7201(a,b,c and d) to 7202(a,b,c and d)	If a farm has a storage for slurry according to B122 or produces solid manure and the entries for 7201(a,b,c and d) to 7202(a,b,c and d) are given but do not add up to 100 %.	Both values are adapted proportionally to the values entered in order to obtain 100 %.

No	A Category/Entry*	B Criterion for plausibility	C Correction
151	7301(a),7302(a), 7303(a),7304(a), 7305(a)	Determination of the percentage of slurry and solid manure on grain crops before seeding/during the growing period, after harvest (stubbles), maize, other field crops and grassland: one or several of the entries 7301(a), 7302(a), 7303(a), 7304(a) or 7305(a) is >100%	Entries of >100% were set to 100 %.
152	7301(a),7302(a), 7303(a),7304(a), 7305(a)	Determination of the percentage of slurry and solid manure on grain crops before seeding/during the growing period, after harvest (stubbles), maize, other field crops and grassland: the sum of the entries 7301(a), 7302(a), 7303(a), 7304(a) or 7305(a) is >100%	Entries resulting in a sum of >100% or <100% were corrected proportionally to 100 %.
153	7301(a),7302(a), 7303(a),7304(a), 7305(a)	Determination of the percentage of slurry and solid manure on grain crops before seeding/during the growing period, after harvest (stubbles), maize, other field crops and grassland: entries in 7301(a), 7302(a), 7303(a), 7304(a) or 7305(a) are missing	7305(a) was set to 100% and the others to 0%.
154	7401(a,b,c,d and e); 7401(f,g,h,i and j) to 7404(a,b,c,d and e); 7404(f,g,h,i and j)	Determination of the weighted application rate per ha (arable land and grassland)	Calculation: sum of [(the entry given for 7401(a,b,c,d and e) (see C155) multiplied with the sum of 7301(a)+7302(a)+7303(a)+7304(a)) + (the entry given for 7401(f,g,h,i and j) (see C155) multiplied with 7305(a)]  Idem for 7402(a,b,c,d and e), 7402 (f,g,h,i,j and k) to 7404(a,b,c,d and e), 7404(f,g,h,i and j)

No	A Category/Entry*	B Criterion for plausibility	C Correction
155	7401(a,b,c,d and e); 7401(f,g,h,i and j) to 7404(a,b,c,d and e); 7404(f,g,h,i and j)	2 entries or more in 7401(a,b,c,d and e); 7401(f,g,h,i and j)	The average was calculated (a,f: 10; b,g: 20; c,h: 30; d,i: 40; e,j: 50)  Idem for 7402(a,b,c,d and e), 7402(f,g,h,i and j) to 7404(a,b,c,d and e), 7404 (f,g,h,i and j)
156	7401(a,b,c,d and e); 7401(f,g,h,i and j)	If a farm has one or more housing systems producing slurry according to B122 and an entry for 7401(a,b,c,d and e); 7401(f,g,h,i and j) is missing. This applies for all farms even for those with 0 ha agricultural surface.	The following default values are entered: 30 for both 7401(a,b,c,d and e) and 7401(f,g,h,i and j)
157	7402(a,b,c,d and e); 7402(f,g,h,i and j) to 7404(a,b,c,d and e); 7404(f,g,h,i and j)	More than 2 entries or If a farm has one or more housing systems producing solid manure according to B137 and an entry for 7402(a,b,c,d and e); 7402(f,g,h,i and j) is missing or if an entry for 7301(b,c and d) to 7305(b,c and d) is missing (see C152). This applies for all farms even for those with 0 ha agricultural surface.	The following default values are entered: 30 for both 7402(a,b,c,d and e) and 7402(f,g,h,i and j)  Idem for 7403(a,b,c,d and e); 7403(f,g,h,i and j) and 7404(a,b,c,d and e); 7404(f,g,h,i and j).
158	7511(a,b,c and d)	If a farm has livestock and entry for 7511(a,b,c or d) is missing	The following default value is entered: 0
159	7521(a,b,c and d)		All entries are eliminated and the following default value is entered: 'sometimes' <sup>11</sup>

<sup>11</sup> About 90% entered the rubric rarely or never (never: about 40%) which was not considered as plausible (possible explanations: too a biased information provided by farmers, misinterpretation of the terms "hot" days, "rarely" and "never" given in the questionnaire.

No	A Category/Entry*	B Criterion for plausibility	C Correction
160	8111(a)	Plausibility of the entry 8111(a) with respect to the N production of a farm with slurry and liquid manure and N demand	A simplified N balance was calculated according to Annex 2 and was crosschecked for plausibility with the total usage of mineral N fertilizer for Schweiz .
161	8121(a)	Calculation of the amount of urea used	Usage N mineral fertilizer corrected I and II (see Annex 2, B5 and B6, respectively) was multiplied with the percentage of urea according to entry 8121(a).

\* The numbering of Category/Entry is according to the German questionnaire used for the mail survey. It can be obtained from <http://agrammon.ch/downloads>

# This procedure was carried out manually.



## Annex 1

### Production of liquid manure per animal

Tierkategorie	Vollgülle	Gülle kotarm
	m <sup>3</sup> /Tier und jahr	m <sup>3</sup> /Tier und jahr
Milchkühe	23	11.5
Aufzuchtrinder unter 1-jährig	5.5	2.7
Aufzuchtrinder 1- bis 2-jährig	8	4
Aufzuchtrinder über 2-jährig	11	5.5
Mutterkühe	15.5	8
Mutterkuhkälber	3.6*	1.8
Masttiere	7.5	3.8*
Mastkälber	3.6*	1.8*
Ferkel abgesetzt (bis 25 kg)	0.8	**
Galtsauen	3.6	**
Säugende Sauen	7.2	**
Eber	3*	**
Mastschweine und Remonten	1.6	**

\* Not given by Flisch et al. (2009)

\*\* Not applied for Agrammon

Source: Flisch et al. (2009)

## Annex 2

### Calculation of a simplified N balance for the check of plausibility of the use of mineral N fertilizer

	A Parameter	B Calculation
1	N production farm (with slurry and liquid manure) [kg]	number of LU <sup>12</sup> per farm ('gvetot')*50 <sup>13</sup> [kg]
2	N demand per farm [kg] for <ul style="list-style-type: none"> <li>– altitude zones 1 and 2:</li> <li>– altitude zone 3:</li> <li>– altitude zone 4:</li> </ul>	agricultural surface per farm [ha]*120 [kg]*0.9 <sup>14</sup> agricultural surface per farm [ha]*100 [kg] *0.9 agricultural surface per farm [ha]*110 [kg] *0.9
3	N balance farm [kg]:	N production farm (B1) [kg] + usage mineral N fertilizer according to entry in 8111(a) [kg] – N demand (B2) [kg]
4	N balance farm in percent of N demand farm:	N balance farm [kg] (B3) / N demand per farm [kg] (B2)
5	Usage N mineral fertilizer corrected I [kg]:	If N balance farm in percent of N demand farm (B4) > 100, the usage of mineral N fertilizer according to entry in 8111(a) was corrected by multiplication with 0.27 <sup>15</sup> ; otherwise the usage of mineral N fertilizer according to entry in 8111(a) was assumed The usage of mineral N fertilizer was set to 0 for organic farms or for farms without N demand (i.e. agricultural surface = 0)
6	Usage N mineral fertilizer corrected II [kg]:	If a farm has a negative N balance (i.e. N balance farm [kg] (B3) <0) and the usage of mineral N fertilizer according to entry in 8111(a) was 0 or an entry for 8111(a) was missing, the usage of mineral N fertilizer was determined as follows: N demand per farm [kg] (B2) - N production farm (B1) [kg] This correction was not applied for organic farms or for farms without N demand.

An extrapolation based on the results of usage N mineral fertilizer corrected I and II, respectively, resulted in an amount of 51'249 t which corresponded well with figures on N mineral fertilizer sales of Switzerland (Treuhandstelle der Schweizerischen Düngerpflichtlagerhalter. 2007):

- Total sales of N mineral fertilizer in 2007: 53'925 t
- Sales of N mineral fertilizer for agricultural use in 2007<sup>16</sup>: 51'768

<sup>12</sup> LU: livestock unit

<sup>13</sup> Production of plant available nitrogen per LU accounting for losses after excretion

<sup>14</sup> It is assumed that 90% of the agricultural surface of a farm receives fertilizer. 10% is ecological compensatory area or other surfaces which are not fertilized

<sup>15</sup> It was assumed that in this case, the total volume of N fertilizer was erroneously entered instead of the N in mineral fertilizer. The correction factor is the N content of ammonianitrate

<sup>16</sup> According to Spiess, (1999), four percent of the total sales of N mineral fertilizer are assumed to be used on non agricultural surfaces (private or public green areas, horticulture etc.)

## References

- Agroscope Liebefeld-Posieux, 2004: Fütterungsempfehlungen und Nährwerttabellen für Schweine. LmZ, Zollikofen, 242pp.
- Spiess, E., 1999. Nährstoffbilanz der schweizerischen Landwirtschaft für die Jahre 1975 bis 1995. Schriftenreihe der FAL 28. Eidgenössische Forschungsanstalt für Agrarökologie und Landbau, Zürich Reckenholz, 46pp. (in German).
- Flisch, R., Sinaj, S., Charles, R., Richner, W. 2009. Grundlagen für die Düngung im Acker- und Futterbau - Kapitel 11-14. Agrarforschung 16(2): 50-71.
- Treuhandstelle der Schweizerischen Düngerpflichtlagerhalter. 2007. Geschäftsbericht 2006/2007 - 57. Geschäftsjahr. Bern.