



Seville, 18 February 2015

REVIEW OF THE BEST AVAILABLE TECHNIQUES (BAT) REFERENCE DOCUMENT FOR INTENSIVE REARING OF POULTRY OR PIGS (IRPP BREF)

Assessment of split view rationales

Table of contents

1	INTRODUCTION.....	2
1.1	General aspects.....	2
1.2	Overview of split views expressed at the final TWG meeting for the review of the IRPP BREF.....	3
1.3	Split views expressed after the final TWG meeting for the review of the IRPP BREF.....	3
1.4	Split views expressed during the final TWG meeting for the review of the IRPP BREF but not confirmed after the meeting	4
1.5	Split views expressed during the final TWG meeting for the review of the IRPP BREF by TWG members without support of a member of the Forum of Article 13	4
2	APPLICABILITY OF AIR CLEANING SYSTEMS FOR FATTENING PIGS.....	4
3	BAT-AEL FOR AMMONIA EMISSIONS TO AIR FROM AN ANIMAL HOUSE FOR FATTENING PIGS	6
4	STORAGE OF SOLID MANURE IN FIELD HEAPS	8
4.1	Split view from DE and NL on the applicability of BAT 8B.e	8
4.2	Split view from EEB on the applicability of BAT 8B.e.....	10
5	TIME DELAY BETWEEN LANDSPREADING OF MANURE AND INCORPORATION INTO THE SOIL	11
6	FULLY SLATTED FLOORS FOR PIG HOUSING FOR NEW PLANTS	12
7	SLURRY ACIDIFICATION.....	16

1 INTRODUCTION

1.1 General aspects

According to Commission Implementing Decision 2012/119/EU (Section 4.6.2.3, page 27), the following provisions apply to dissenting views expressed at final TWG meetings:

4.6.2.3. Final TWG meeting

4.6.2.3.1. General

The final TWG meeting aims at resolving outstanding issues with a view to conclude the technical discussions within the TWG.

...

In the final TWG meeting, the objective is to reach conclusions by consensus of the TWG members present. When there are well founded dissenting views, these will be recorded as indicated in Section 4.6.2.3.2 below.

4.6.2.3.2. Split views

BAT as well as environmental performance levels (see Section 3.3) associated with BAT will be drafted by the EIPPCB on the basis of information available at the time of distributing the draft to the TWG for its final meeting (see Section 4.6.2.3). Such information may include any specific proposals for BAT or associated environmental performance levels received from the TWG.

TWG members are expected to provide sound technical, cross-media and economic arguments as relevant to their case when they do not agree with the draft BAT conclusions. Such arguments should be submitted initially as comments to the formal draft BREF within the consultation period set (see Section 1.2.4).

If the TWG in the end reaches no consensus on an issue, the dissenting views and their rationale will be reported in the 'Concluding remarks and recommendations for future work' section of the BREF only if both the following conditions are fulfilled:

- 1. the dissenting view is based on information already made available to the EIPPCB at the time of drafting the conclusions on BAT for the BREF or has been provided within the commenting period corresponding to such a draft;*
- 2. a valid rationale supporting the split view is provided by the TWG member(s) concerned. The EIPPCB will consider a rationale to be valid if it is supported by appropriate technical, cross-media or economic data or information relevant to the definition of BAT.*

The Member States, environmental NGOs or industry associations that bring or support the split view will be explicitly named in the document (see Section 2.3.10).

Note that the acceptance of a dissenting view indicates that the above criteria have been achieved. This allows a dissenting view to be recorded in the Concluding Remarks of the BREF. Acceptance of a dissenting view does not result in changes to the BAT conclusions as agreed at the final TWG meeting.

1.2 Overview of split views expressed at the final TWG meeting for the review of the IRPP BREF

During the final TWG meeting for the review of the IRPP BREF held from 17 to 21 November 2014 in Seville, a high degree of consensus was achieved within the TWG. Nevertheless, dissenting views on seven different topics were recorded, which are listed in the following table:


Split view number	Meeting conclusions' slide number(s)	Topic	Conclusion number	TWG member(s)	Section in this document
1	177, 178, 179	Applicability of air cleaning systems for fattening pigs	23c	DE, EEB	2
2	189	BAT-AEL for ammonia emissions to air for fattening pigs	23	DE, DK, NL, SE, FI, EEB	3
3	214	Applicability of the technique 'Storage of solid manure in field heaps'	8B.e	DE, NL	4.1
				EEB	4.2
4	249	Time delay between landspreading of solid manure and incorporation into the soil	10A	DE, NL, EEB	5
5	264	Time delay between landspreading of slurry and incorporation into the soil	33A	DE, NL, EEB	5
6	145, 147, 149, 151, 153, 167, 169, 171	Fully slatted floors for pig housing for new plants and for all pig categories	20, 21, 22, 23	EEB, AT, FI	6
	145, 147, 149, 151, 153, 169	Fully slatted floors for pig housing for new plants and for mating and gestating sows, weaners and fattening pigs	20,22,23	DK	6
	145, 147, 149, 151, 153, 169	Fully slatted floors for pig housing for mating and gestating sows and for fattening pigs	20,23	NL	6
7	181	Slurry acidification	20d1, 21d1, 22d1, 23d1	ES, EEB	7

For each of the split views the detailed rationales provided by the TWG member(s) concerned are reported in the following pages together with the EIPPCB's assessment and an indication on whether/how the split views could be formulated in the BREF. The content of individual split views on the same topic may differ from one to another. In this document, some split views are grouped together when the proposal and the rationale are similar and the split views refer to each other.

1.3 Split views expressed after the final TWG meeting for the review of the IRPP BREF

An additional 'split view' on the legal status of using fully slatted floors for the rearing of ducks was submitted by EEB after the final TWG meeting without having been raised during the meeting. This position is not presented or assessed in this document given that the last

paragraph of Section 4.6.2.3.1 of Commission Implementing Decision 2012/119/EU (under '4.6.2.3 Final TWG meeting') stipulates that:

'In the final TWG meeting  the objective is to reach conclusions by consensus of the TWG members present. When there are well founded dissenting views, these will be recorded as indicated in Section 4.6.2.3.2 below.'

1.4 Split views expressed during the final TWG meeting for the review of the IRPP BREF but not confirmed after the meeting

A dissenting view by FR was announced during the final TWG meeting related to the BAT-AEL for ammonia emissions to air from housing of weaners, but was not confirmed by documentation sent after the meeting to the EIPPCB, so this split view is considered as not having been submitted.

1.5 Split views expressed during the final TWG meeting for the review of the IRPP BREF by TWG members without support of a member of the Forum of Article 13

A dissenting view by the TWG member from IFIP (representative of COPA-COGECA) was announced during the final TWG meeting related to the BAT-AEL for ammonia emissions to air from housing of weaners.

This split view was not supported during the final TWG meeting by COPA-COGECA, which is a member of the Forum established pursuant to Article 13 of Directive 2010/75/EU. This dissenting view is therefore not presented or assessed in this document.

Another split view, joining the split view on slurry acidification expressed during the final TWG meeting (see Split view Nr 7) was also confirmed by IFIP (representative of COPA-COGECA). Given that this split view is not registered by COPA-COGECA, which is a member of the Forum established pursuant to Article 13 of Directive 2010/75/EU, this dissenting view is not presented or assessed in this document.

2 APPLICABILITY OF AIR CLEANING SYSTEMS FOR FATTENING PIGS

Conclusion of the meeting

Slides 177, 178 and 179 on the applicability of air cleaning systems: *This technique may not be generally applicable due to the high implementation cost.*

Split view summary

Germany and EEB propose to change the applicability of all techniques for air cleaning systems in fattening pig houses to *'may not be applicable due to high implementation cost in existing plants'* because, in new plants (slurry-based with forced ventilation) for the rearing of

fattening pigs, the air cleaning system is already state of the art and therefore a best available technique.

The split view is accompanied by the following rationale:

- In Europe, air cleaning systems are very often used to comply with environmental standard and are implemented in over a thousand fattening pig houses in Germany, as well as in more than a thousand farms in the Netherlands. This development is due to farmers using this technique are able to realise more reliable planning for their future activities as they are prepared for stricter environmental standards. Farmers also apply air cleaning systems in fattening pig plants to extend their capacity due to higher economic yields.
- Recent information such as publications by Hahne, 2011 (reference 505 in BATIS) and Hahne, 2014 show the development of the installed air cleaning systems in Germany. Data shows (see attached figure) the steady increase in the number of air cleaning systems installed during recent years in fattening pig plants in Germany (from less than 200 installed in 2004 to more than 1000 in 2013).
- On this basis, three German Laender (Niedersachsen, Nordrhein-Westfalen and Schleswig-Holstein) require air cleaning systems in new plants for fattening pig production (slurry-based, forced ventilation) in accordance with edicts of 2013.

EIPPCB assessment

- Information from the source 'Hahne, 2014' as well as the attached figure showing the increase in air cleaning systems from 2004 to 2013 were not exchanged during the review process.
- On the basis of the information included in the BREF [505, Hahne J. 2011], the total number of the air cleaning systems in Germany has increased steadily during recent years covering a wide range of treatment capacity. In particular, 368 air cleaning systems were installed in fattening pig plants (unclear if this was in new or existing plants) from 2006 to 2010, 63 of which were installed in fattening pig plants with a capacity above the IED threshold.
- In [508, TFRN 2014] it is recognised that air cleaning systems have proven to be practical, effective and with lower costs for large-scale operations. At the same time, it is accepted that further information is required for their suitability in Southern and Central Europe.
- The costs for the installation of air cleaning systems in new plants with centralised ventilation are lower than in existing plants with decentralised ventilation, since there will be no additional expenses for the conversion of the ventilation system. Nevertheless, they are high in comparison with other ammonia abatement techniques (EUR 10 to EUR 15/animal place/year in new plants).
- It is not clear whether the development of air-cleaning systems in Germany was driven by local requirements.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view is supported by appropriate technical arguments. Therefore the split view will be reported in the 'Concluding remarks and recommendations for future work' section of the BREF.

A possible formulation of this split view could be:

Germany and the European Environmental Bureau expressed a dissenting view that the applicability of air cleaning systems for new fattening pig plants should be set as 'generally applicable'.

3 BAT-AEL FOR AMMONIA EMISSIONS TO AIR FROM AN ANIMAL HOUSE FOR FATTENING PIGS

Conclusion of the meeting

Slide 189 on Table 5.6:

Table 5.6: *BAT-AEL for ammonia emissions to air from an animal house for fattening pigs*

<i>Parameter</i>	<i>Animal category</i>	<i>BAT-AEL ⁽¹⁾ ⁽²⁾ ⁽³⁾ (kg NH₃/animal place/year)</i>
<i>Ammonia expressed as NH₃</i>	<i>Fattening pigs</i>	<i>0.1 – 2.6</i>
<i>⁽¹⁾ For existing plants using BAT 23.a0 in combination with nutritional measures, the upper end of the BAT-AEL is 3.6 kg NH₃/animal place/year.</i>		
<i>⁽²⁾ For plants using BAT 23.a9, 23.a10, 23.a12 or 23.a13, the upper end of the BAT-AEL is 5.65 kg NH₃/animal place/year.</i>		
<i>⁽³⁾ The lower end of the range is associated with the use of an air cleaning system.</i>		

Split view summary

Germany, Denmark, the Netherlands, Sweden, Finland and EEB do not support the TWG conclusion to set the upper end of the generic BAT-AEL for fattening pigs at 2.6 kg NH₃/animal place/year and propose to set the upper end of the generic BAT-AEL at 2.2 kg NH₃/animal place/year.

The split view is accompanied by the following rationale:

- The upper value of the generic BAT-AEL neither defines a sufficient European environmental standard for the reduction of ammonia emissions and environmental improvement, nor supports the requirements of the IED to harmonise the competitive conditions in Europe.
- The emission factor (EF) from the slurry-based fattening pig production process is determined as 3.0 kg NH₃/animal place/year (UNECE Guidance Document, 2012) up to 3.6 kg NH₃/animal place/year (EFs reported by several Member States). The application of N-adapted feeding (a standard for fattening pig production that is already applied in many European IED plants and is required by BAT 18) will result in ammonia emissions of 2.4 – 2.9 kg NH₃/animal place/year, i.e. on average 2.65 kg NH₃/animal place/year.
- As a consequence, the reduction measures related to the BAT-AEL for fattening pigs may not need to be applied by farmers to fulfil the upper end of the generic BAT-AEL, because this level of ammonia emissions is already fulfilled by using N-adapted feeding in fattening pig production.
- The upper value of the generic BAT-AEL has no basis in the ample data collected by the TWG. During the final meeting, the figure 2.6 kg NH₃/animal place/year for the slurry cooling technique was mentioned. This value of 2.6 has been derived on the basis of a Danish source [268] which shows measured values of 1.16 – 1.52 kg NH₃/animal place/year. This equals a 10 % reduction of ammonia emissions per 10 W/m² of cooling, in comparison with the Danish reference system. Apparently this reduction percentage has been used to model the effect of cooling under other conditions (maybe according to the UNECE reference). It is unclear how it is done, and the data cannot be found in reference [268]. These data should therefore not be used, and certainly not for setting the BAT-AEL.
- If the intention is to base the BAT-AEL on the data collected by the TWG, this calls for a much lower value for fattening pigs. At the final TWG meeting there was consensus about technique a1 being the reference system and a0 (fully or partially

slatted floor with a deep pit) not being applicable to new farms. Techniques a9 – a13 are litter-based systems. For slurry-based systems, the emission values used to define the upper end of the BAT-AEL should hence be data from housing systems a2 – a8. Data submitted by Member States regarding these seven techniques show ammonia emissions ranging from 0.89 kg to 1.69 kg NH₃/animal place/year (no data for fattening pigs on a2 and no data on technique a7 and a8). The range includes measured data from southern European countries, i.e. [188, ES, for BAT 23.a3: 1.23 – 1.61 kg NH₃/animal place/year], [196, ES, for BAT 23.a7: 0.89 – 1.69 kg NH₃/animal place/year] & [292, IT, for BAT 23.a4: 1.5 – 1.8 kg NH₃/animal place/year].


EIPPCB assessment

- The reference [508, UNECE] does not clearly state whether the EF of 3.0 kg NH₃/animal place/year includes nutritional measures or not. According to the same source, the reference system for feeding is often not clearly documented, and variations between countries are significant.
- The emission reduction effect of nutritional techniques, such as N-adapted feeding, depends on the initial crude protein content of the feed, on the applied reduced level of crude protein (with or without synthetic amino acid supplementation), on the number of phases as well as on the proper management of the farm which is expressed through animal performance. Therefore, a reduction percentage for NH₃ emissions from housing by the application of N-adapted feeding is not straightforward and applicable for all circumstances. This is illustrated in reference [575, UBA] where a calculation is performed for different nutritional techniques and its effect on ammonia emission factors. According to these calculations, there may be cases in which emissions from housing of fattening pigs can be below 2.6 kg NH₃/animal place/year by the application of nutritional measures only.
- The NH₃ emission level of 2.6 kg NH₃/animal place/year has been reported (as a range from 2.2 kg to 2.6 kg NH₃/animal place/year for a cooling effect of 10 – 50 W/m²) for the technique 'slurry cooling' combined with a partly slatted floor with a scraper for frequent manure removal (see references [160, DK] and [197, DK]). The TWG concluded that both of these techniques are BAT (BAT 23.b1 and BAT 23.a4). The upper end of the BAT-AEL range coincides with the upper end of the range reported by reference [160, DK] for the combination of techniques 'slurry cooling'+ 'partly slatted floor'. In the compilation file, as well as in Table 4.110 of the revised Draft 2 of the IRPP BREF, the reference [268, DK] has to be corrected by reference [160, DK]. In Table 4.85 of the revised Draft 2 of the IRPP BREF, the correct references were already cited.

EIPPCB conclusion

Taking these points into account, the EIPPCB considers that the split view is supported by appropriate technical arguments. This split view will therefore be reported in the 'Concluding remarks and recommendations for future work' section of the IRPP BREF.

A possible formulation of this split view could be:

A dissenting view was expressed by Germany, Denmark, the Netherlands, Sweden, Finland and the European Environmental Bureau who consider that that  upper end of the BAT-AEL range for ammonia emissions to air from an animal house for fattening pigs should be 2.2 kg NH₃/animal place/year.

4 STORAGE OF SOLID MANURE IN FIELD HEAPS

Overview

Two split views were received on BAT 8B.e. Given that the proposals and their rationales vary to some extent, they are presented separately below.

Conclusion of the meeting

Slide 214 on BAT 8B.e:

	<i>Technique</i>	<i>Applicability</i>
<i>e</i>	<i>Store solid manure in field heaps placed away from surface and/or underground watercourses which liquid run-off might enter</i>	<i>Only applicable to temporary field heaps which change location each year.</i>

Description of BAT 8B.e:

<i>Store solid manure in field heaps placed away from surface and/or underground watercourses which liquid run-off might enter</i>	<i>Solid manure is stacked directly on the soil over a limited period of time. The storage location is changed at least every year and situated as far as possible from drains, boreholes, wells, surface waters, springs, etc.</i>
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4.1 Split view from DE and NL on the applicability of BAT 8B.e

Split view summary

Germany and the Netherlands do not support the TWG conclusion to determine the BAT 8B.e as BAT and propose to change its applicability as follows:

'Only applicable as a direct logistic preparation of land spreading activities for a restricted time span (e.g. 4 weeks without covering and 3 months with covering) and with a suitable substrate to reduce pollution risks. Field heap locations should be changed at least every year. Sufficient storage capacity on the farm according to BAT 8B.d must always be provided'.

EEB supports the rationale below but provides additional arguments and a modified proposal for changing the applicability of BAT 8B.e (see Section 4.2).

The split view is accompanied by the following rationale:

- BAT 8B.e was proposed for the BAT conclusions after Draft 2. There is no detailed description of this practice in Chapter 4.11.1 of the revised Draft 2 of the IRPP BREF.
- Manure storage according to BAT 8B.b (Use a concrete silo for storage) or BAT 8B.c (Store solid manure on solid impermeable floor equipped with a drainage system and a collection tank for the run-off) is generally applicable. According to BAT 8B.d (Select a storage facility with a sufficient capacity to hold the manure during periods in which the application to land is not possible), the on-farm storage facilities previously described are generally required and farms must always provide enough storage capacity on the farm. Thus field storage (up to one year as described in Section 5.4.5 of the revised D2) is not needed as an individual BAT category and can never be BAT.

- Compared to BAT 8B.b and 8B.c, field heaps, especially when used over a longer period, will always cause nutrient leaching into soil and water and surface run-off. This cannot be avoided and thus the pollution risk for soil and water is high and not controllable.
- In order to reduce pollution risks, solid manure shall only be kept in the form of a manure heap on the field temporarily for a very short time (no longer than 2 weeks) and only before landspreading and not for storage. Manure heaps on the field shall always have a suitable substrate.

EIPPCB assessment

- The introductory statement of BAT 8.B is *'In order to prevent, or where that is not practicable, to reduce emissions to soil and water from the storage of solid manure...'*. According to the information in Section 4.11.1 of the revised D2, temporary field storage of solid manure in heaps is an applied technique reported by several Member States. A common applied practice is to set a sufficient distance between field heaps and receiving waters/drains.
- If manure is stored directly on the soil surface, leachate from solid manure heaps may seep into the soil and/or flow over the soil surface in response to rainfall events. Pollutants in leachate infiltrating soil underneath a field heap (and in run-off from the heaps) are likely to be either retained in the soil or diluted with 'uncontaminated' water from the rest of the field. Therefore, pollutant concentrations can be reduced provided that there are sufficient distance/barriers between the field heap and the receiving water. Changing the location of temporary field heaps will reduce the accumulation of nutrients underneath the heaps.
- The restricted time span for the temporary storage is already covered by the description of the technique. This time span cannot be quantified, as it depends on local conditions (e.g. climate, soil type).
- In the BAT conclusions of the 2003 ILF BREF, it was concluded that *'for a temporary stack of pig manure in the field, BAT is to position the manure heap away from sensitive receptors such as, neighbours, and watercourses (including field drains) that liquid runoff might enter'*. No further information has been provided during the review of the IRPP BREF to further evaluate the effect of temporary field heaps on water quality and soil nutrient status.
- In Section 2.6.3 of the BREF it is stated 'Temporary field heaps are created prior to field application. They may remain in place for a few days or for several weeks. Since soil and water contamination can occur, depending on the rainfall and the length of storage, heaps should be located where there is no risk of direct run-off entering watercourses or infiltration of liquid fractions seeping from heaps to groundwater'. The term 'field heap' implies that temporary manure stacks on the field are associated with land spreading activities.

EIPPCB conclusion

Taking these points into account, the EIPPCB considers that the split view is supported by appropriate technical arguments. This split view will therefore be reported in the 'Concluding remarks and recommendations for future work' section of the IRPP BREF.

A possible formulation of this split view could be:

Germany and the Netherlands expressed a dissenting view that the applicability of the technique 'Store solid manure on field heaps placed away from surface and/or underground watercourses which liquid run-off might enter' should be changed to read 'Only applicable to temporary field heaps which change location at least every year, in view of landspreading

activities for a restricted time span (e.g. four weeks without covering and three months with covering) to reduce pollution risks.'

4.2 Split view from EEB on the applicability of BAT 8B.e

Split view summary

EEB does not support the TWG conclusion for the applicability of BAT 8B.e and proposes to modify it as follows:

'Only applicable to temporary field heaps of pig manure which change location each year, which are covered, and which originate from farms that fully implement the litter and straw systems referred to in BAT 20, 21, 22 and 23.'

The split view is accompanied by the following rationale:

- The same rationale as in Section 4.1 of this document.
- Additionally, the transition to improved welfare systems must be encouraged. In this case, farmers will increasingly use straw, mainly in mixed systems (slurry and litter).
- Necessary and urgent transition to the more welfare-friendly, litter-based housing systems, which will also provide benefits from agro-ecological perspectives, should not hinder the implementation of solid manure systems by disproportional investment in concrete.

EIPPCB assessment

- For the assessment of the rationale provided in Section 4.1, see Section 4.1.
- BAT 8B applies to both poultry and pig solid manure. No techno-economic information is provided to support the proposal neither for a different handling between pig and poultry solid manure nor for covering the field heap. The argument of encouraging the development of solid manure systems in pig rearing is not based on technical or economic information basis.
- The technique 'Cover solid manure heaps' was removed from the list of techniques in BAT 8B. during the Final TWG meeting.

EIPPCB conclusion

Taking these points into account, the EIPPCB considers that the split view is not supported by appropriate technical arguments to the extent that the associated proposal is different from the one expressed in Section 4.1. This split view will therefore not be reported in the 'Concluding remarks and recommendations for future work' section of the IRPP BREF.

5 TIME DELAY BETWEEN LANDSPREADING OF MANURE AND INCORPORATION INTO THE SOIL

Overview

Two split views have been raised on the TWG conclusions related to the time delay between landspreading of manure and incorporation into the soil. Since the reasons for the split views and the proposals are similar, their assessment has been combined.

Conclusion of the meeting

Slide 249 (on Table 5.0) and slide 264 (on Table 5.8B):

Table 5.0: *BAT-associated time delay between landspreading of solid manure and incorporation into the soil*

<i>Parameter</i>	<i>BAT-associated time delay between landspreading of solid manure and incorporation into the soil (hours)</i>
<i>Time</i>	$0^{(1)} - 4^{(2)}$
⁽¹⁾ The lower end of the range corresponds to immediate incorporation. ⁽²⁾ The upper end of the range can be up to 12 hours when conditions are not favourable for a faster incorporation, e.g. when human and machinery resources are not economically available.	

Table 5.8 B: *BAT-associated time delay between slurry landspreading and incorporation into the soil*

<i>Parameter</i>	<i>BAT-associated time delay between slurry landspreading and incorporation into the soil (hours)</i>
<i>Time</i>	$0^{(1)} - 4^{(2)}$
⁽¹⁾ The lower end of the range corresponds to immediate incorporation. ⁽²⁾ The upper end of the range can be up to 12 hours when conditions are not favourable for a faster incorporation, e.g. when human and machinery resources are not economically available.	

Split view summary

Germany, the Netherlands and EEB do not support the TWG conclusion to set the time delay between landspreading of solid manure/slurry and incorporation into the soil at up to 12 hours when conditions are not favourable for a faster incorporation and **propose to delete footnote ⁽²⁾** in Tables 5.0 and 5.8 B.

The split views are accompanied by the following rationale:

- High emission reductions (up to 60 – 90 %) can only be achieved if surface-applied solid manure or slurry is incorporated as soon as possible after spreading and at least within a time span of 4 hours. Reduction efficiency decreases strongly to 50 % if the time delay is up to 12 hours (Section 4.13.5 of Draft 2 of the IRPP BREF, UNECE 2014).
- Dried solid manure from poultry will be re-moistened and high odour and ammonia emissions will occur.
- In consequence, if the time delay between application and incorporation is up to 12 hours, a large amount of the nitrogen (ammonia) that has been mitigated in housing and during storage by applying costly measures will be released again. Thus the reduction and the cost efficiency not only of manure application but also of mitigation measures applied in housing and during manure storage will be reduced.
- Immediate manure incorporation is one of the most cost-effective measures for ammonia reduction (like N-reduced feeding strategies and covering of manure

stores). Reduction costs per kg NH₃ abated per year are very low or even negative, indicating a benefit. This is especially true in comparison to other mitigation measures, e.g. in housing (UNECE 2014).

- Very often incorporation of manure is connected with soil cultivation before planting. The incorporation of manure on IED farms is a common practice.
- The scope of the BREF only covers large farms. On these farms it should be possible to meet the logistical challenges as experiences in DE and NL demonstrate.

EIPPCB assessment

- The cumulative NH₃ emissions to air increase hyperbolically with time. Effectiveness in NH₃ abatement, as well as cost-effectiveness for ammonia abatement in the whole production chain, makes the rapid character of the incorporation worthwhile.
- In Section 4.13.5 of the revised Draft 2 of the IRPP BREF is reported (reference [35, NL]) that organising incorporation within a shorter time than 12 hours does not cause a logistics problem. However, it is also reported in Section 4.13.5 of the revised Draft 2 of the IRPP BREF that there are cases when incorporation within 4 hours is difficult or, even impossible, to realise, as many variables can affect the achieved working rate of the combined task of spreading-incorporation in the field. Delays may be caused by, especially, low availability of human resources or machinery in relation to the size of the fields.
- Additionally, farms with a capacity close to the threshold specified in Section 6.6 of Annex I to Directive 2010/75/EC can be small family enterprises run by very few people (e.g. one to two); this may impose limitations on human resources and/or available machinery.

EIPPCB conclusion

Taking these points into account, the EIPPCB considers that the split views expressed by DE, NL and EEB are supported by appropriate technical arguments. These split views will therefore be reported in the 'Concluding remarks and recommendations for future work' section of the IRPP BREF.

A possible formulation of these split views could be:

Dissenting views were expressed by Germany, the Netherlands and the European Environmental Bureau, proposing to delete footnote ⁽²⁾ in Table 5.0 and Table 5.8 B related to the BAT-associated time delay between landspreading of solid manure or slurry and incorporation into the soil.

6 FULLY SLATTED FLOORS FOR PIG HOUSING FOR NEW PLANTS

Conclusions of the meeting

Slides 145, 147, 149, 151, 153, 167, 169 and 171 where pig housing techniques include fully slatted floors.

Example of BAT Conclusion (e.g. slide 151):

<i>Technique</i>	<i>Animal category</i>	<i>BAT</i>	<i>Applicability</i>
<i>Fully or partly slatted floor with a scraper for frequent slurry</i>	<i>Mating and gestating sows</i>	<i>20.a4</i>	<i>This technique may not be generally applicable to existing plants due to</i>

<i>removal</i>	<i>Farrowing sows</i>	<i>21.a2</i>	<i>technical and/or economic considerations. For mating and gestating sows, fully slatted floor is only applicable when less than 15 % of the surface of the lying area is reserved for drainage openings.</i>
	<i>Weaners</i>	<i>22a.2</i>	
	<i>Fattening pigs</i>	<i>23.a4</i>	

Split view summary

EEB does not support the TWG conclusion that housing systems with fully slatted floors are BAT for all pig categories for new plants and proposes an applicability restriction for all BAT conclusions which include fully slatted floors for pig housing, as follows: *'Fully slatted floor is not applicable to new plants.'*

Austria and Finland support the split view for all pig categories (BAT 20, 21, 22 and 23). Denmark supports the split view for mating and gestating sows, weaners and fattening pigs (BAT 20, 22 and 23). The Netherlands supports the split view for mating and gestating sows and for fattening pigs (BAT 20 and 23).

The split views are accompanied by the following rationale:

- The use of fully slatted floors (FSF) cannot be BAT for new plants, because partly slatted floors (PSF) are better available techniques. In addition, PSF is a mitigation technique for ammonia emissions increasing the reduction efficiency of other mitigation techniques when used in combination. Furthermore, PSF perform better than FSF on animal welfare issues. Several countries have prohibited FSF for animal welfare reasons and/or are phasing them out, either for all (FI, SE) or for certain categories of pigs (DK, NL; AT for farrowing sows).
- The use of FSF is a major reason for widespread non-compliance with legal welfare requirements in Directive 2008/120/EC (codification of earlier legislation on minimal standards for the protection of pigs). The statement that FSF are not applicable to new plants would help with 'continuous awareness raising' and can be an incentive for sustainable, socially acceptable innovation. In particular:
 - Directive 2008/120/EC requires the provision of enrichment materials in Annex I, Chapter I.4: *"Notwithstanding Article 3(5), pigs must have permanent access to a sufficient quantity of material to enable proper investigation and manipulation activities, such as straw, hay, wood, sawdust, mushroom compost, peat or a mixture of such, which does not compromise the health of the animals"*. Inspections reveal widespread non-compliance in most Member States. Therefore the Commission has prepared draft guidelines to actively assist Member States in the application of these requirements, and a training tool is published by the EUWelNet programme. The guidelines highlight the importance of pig welfare in the requirement in Annex I, Chapter I.4 and make it clear that materials must be supplied that are effective in achieving the objective of Chapter I.4, i.e. that pigs are able to engage in 'proper investigation and manipulation activities'. FSF are widely recognised as an obstacle to providing appropriate enrichment, e.g. in France, TechPorc, September-October 2014 states on page 19: *'In many countries, the presence of FSF restricts the choice of enrichment materials because of the risk of passing through the slats. Therefore the provision of straw or roughage is a problem, mainly if one wants to distribute sufficient amounts to satisfy the needs of the animals.'*
 - Ban on routine tail docking: Annex I, Chapter I.8 of Directive 2008/120/EC states that *'Neither tail-docking nor reduction of corner teeth must be carried out*

routinely but only where there is evidence that injuries to sows, teats or to other pigs, ears or tails have occurred. Before carrying out these procedures, other measures shall be taken to prevent tail-biting and other vices, taking into account environment and stocking densities. For this reason inadequate environmental conditions or management systems must be changed.' EFSA has concluded that the principal causal factors of tail biting are: *'the absence of straw, the presence of slatted floors and a barren environment'*. The draft guidelines prepared by the Commission state: *'The main risk factor for tail biting is the lack of sufficient enrichment material with proper functionality for the pig.'*

- Nest-building material for farrowing sows (Chapter II, B.3) is mandatory, but poorly applied due to a derogation: *"In the week before the expected farrowing time sows and gilts must be given suitable nesting material in sufficient quantity unless it is not technically feasible for the slurry system used in the establishment."* Appropriate nesting material is recognized by EFSA as being important for sows but in practice it is very difficult to supply nesting material on fully slatted floors.
- Physical and thermal comfort (Annex I, Chapter I.3) states: *'pigs must have access to a lying area physically and thermally comfortable'*. FSF is not physically or thermally comfortable because it offers no choice of thermic environment according to individual needs.

EIPPCB assessment

- PSF are included in the list of BAT. According to the BAT conclusions agreed at the final TWG meeting, housing systems with a FSF with a deep pit, one of the most common techniques in some EU countries, are only applicable for new houses in combination with an additional technique such as air cleaning systems. Housing systems with a FSF and an additional mitigation measure (e.g. slurry removal by scraper, with slanted walls in the manure channel) can achieve reduced ammonia emissions.
- FSF are not forbidden by Directive 2008/120/EC laying down minimum standards for the protection of pigs or any other European legislation.
- In the Scope of the BAT Conclusions it is stated that: 'These BAT conclusions apply without prejudice to other relevant legislation, e.g. on animal welfare'.
- The TWG has agreed at the final meeting to add under the 'Concluding remarks and recommendations for future work' chapter of the IRPP BREF, 'the need to review the issue of FSF in pig housing especially in consideration of future evolution of the legal EU framework and scientific evidence regarding animal welfare'.
- According to [495, EFSA, 2007], the largest risk for pigs of having their tails bitten is the lack of appropriate enrichment. This risk involves many other factors, e.g. stocking density, associated with lack of enrichment and fully slatted floors. It is also concluded that "Maintaining pigs in systems on floors without straw bedding is a major hazard for tail biting. In unbedded systems, a higher proportion of slatted flooring is an additional hazard" and that 'Absence of a particulate, rootable substrate is a significant hazard for tail biting'. In addition, it is recognised by EFSA [Scientific opinion for the 'Animal health and welfare in fattening pigs in relation to housing and husbandry' (2007)], that the provision of appropriate enrichment material is difficult in pens with FSF and it may be problematic to slurry handling; also that the use of straw is limited with FSF.
- For mating and gestating sows the applicability restriction *"For mating and gestating sows, fully slatted floor is only applicable when less than 15 % of the surface of the lying area is reserved for drainage openings"* ensures the provision of adequate manipulable material.
- However, small quantities of straw from racks, if sufficient to allow rooting behaviour, can be used for environmental enrichment on any slatted floors. The draft

guidelines of the EUWelNet training tool recognise that enrichment material can be offered in feeders or racks and problems in the slurry system can be avoided with careful management.

- In a scientific opinion by EFSA [494, EFSA, 2007], it is stated that 'nesting material is typically lacking in systems with FSF, as systems often are not built for use of such nesting material, and it is thus possible to use FSF in new built farrowing systems'. New plants for farrowing sows with FSF can be designed in a way that slurry management system can handle straw used for nest building.
- The thermal comfort depends on a combination of many factors such as pen design, diet, type of flooring, cooling and ventilation systems and climatic conditions. If the ambient temperature is high, a perforated floor can have a greater cooling effect in overheated pigs than a solid area.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view is supported by appropriate technical arguments only for fattening pigs and weaners. Therefore the split view will be reported in the 'Concluding remarks and recommendations for future work' section of the BREF for fattening pigs and weaners whereas it will not be reported for mating and gestating sows and for farrowing sows.

A possible formulation of this split view could be:

The European Environmental Bureau, supported by Austria, Finland and Denmark, expressed a dissenting view that housing systems with fully slatted floors should not be applicable to new plants for fattening pigs and weaners. The split view is supported by the Netherlands only for fattening pigs.

7 SLURRY ACIDIFICATION

Conclusion of the meeting

Slide 181 on BAT 20d.

<i>Technique</i>	<i>Animal category</i>	<i>BAT</i>	<i>Applicability</i>
<i>Slurry acidification</i>	<i>Mating and gestating sows</i>	<i>20.d1</i>	<i>Generally applicable</i>
	<i>Farrowing sows</i>	<i>21.d1</i>	
	<i>Weaners</i>	<i>22.d1</i>	
	<i>Fattening pigs</i>	<i>23.d1</i>	

Description of the technique:

<i>Slurry acidification</i>	<i>Sulphuric acid is added to slurry in order to lower the pH to about 5.5 in the slurry pit so that the chemical balance shifts from NH_3 to NH_4^+. The addition can be carried out in a process tank, followed by aeration and homogenisation. Part of the treated slurry is pumped back to the storage pit under the housing floors in order to reduce ammonia volatilisation. The treatment system is fully automated. Prior to (or after) landspreading on acid soils, lime addition may be required to neutralise the pH of the soil.</i>
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Split view summary

ES, supported by EEB, propose to add applicability restrictions to BAT.20 d1, 21.d1, 22.d1 and 23.d1 concerning slurry acidification, in the sense that the technique should be subjected to long-term supervision and specific control measures.

The split view is accompanied by the following rationale:

The proposed technique is based on the use of strong acids (especially sulphuric acid) to acidify slurry (pH below 5.5) and does not take into account the severe restrictions on the use of chemicals inside farm facilities or by the workers.

- The comments sent by Spain in advance of the final TWG meeting strongly supported the idea of introducing specific remarks under the applicability section to introduce precautionary measures regarding the use of this technique such as *"It should be limited taking into account the animals/workers/environment safety. Use only by trained staff. Special processing machinery must be used"*.
- Most of the available information on slurry acidification belongs to the last 3-4 years and is mainly limited to one or two European countries. Thus, it cannot be concluded that the technique is widely used and safe for the animals, workers, consumers, the environment and even for the farm utilities (taking into consideration the corrosive nature of the substances).
- No data for the safe use of the technique are available for long-term exposure or for different soil or climatic conditions.
- The economic costs are not negligible, and certainly do not allow the evaluation of the applicability as 'general applicable'.

EIPPCB assessment

- On the basis of the information reported in Section 4.12.9 of the revised Draft 2 of the IRPP BREF, the target when lowering the slurry pH is 5.5, which is similar to the acidity of unpolluted rainwater.

- As outlined under Chapter 3.2.3 'Information to assess the applicability of techniques of the Commission Implementing Decision 2012/119/EU: *Information to assess the applicability of particular techniques shall in particular address the following, if relevant: 'new' versus 'existing' plants, size of the plant, type of process used, type of fuel or raw material used, load factor, yield or productivity, climatic conditions and space requirements. No cross-media effects will be mentioned unless they result in restrictions on applicability*'.
- Under cross-media effects in Section 4.12.9 of the revised D2, it is reported that handling strong acids on farms is hazardous. For this reason, a fully automated system, with no manual contact with sulphuric acid and automated management of the slurry (including discharging operations) is necessary. In the description of the technique in the BAT conclusions it is specified that *'The treatment system is fully automated'*.
- No safety issues or incidents were reported during the information exchange from the implementation of the technique on farms when it is properly managed.
- The training of the staff in aspects of worker safety is covered by BAT 2.b.
- The reported number of farms that have implemented the technique (125 farms in Denmark and 20 farms in Spain) and the reported associated costs in the BREF allow the technique to be considered available as defined in Article 3(10).b of Directive 2010/75/EU.
- It was already decided in the final TWG meeting to report, in the 'Concluding remarks and recommendations for future work' chapter of the BREF, the need to collect data on the effects of slurry acidification on soil fertility, according to the soil type and climate.

EIPPCB conclusion

Taking these points into account, the EIPPCB considers that the split view is not supported by appropriate technical information. This split view will therefore not be reported in the 'Concluding remarks and recommendations for future work' section of the BREF.