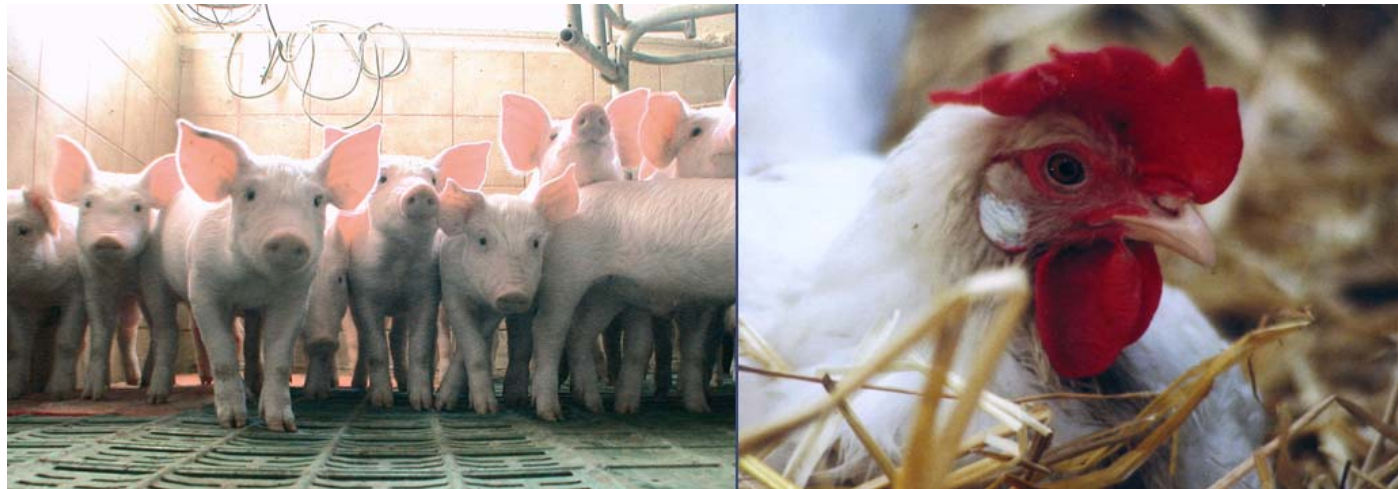


EU Project

BAT-SUPPORT

Best Available Techniques for European Intensive Livestock farming – Support for the implementation of the IPPC-Directive

Project overview



TFRN Meeting, 28-29th April, Garmisch-Partenkirchen



- **Background**
- **Objectives**
- **Status of the project**
- **Outlook**



- Department of System Analysis, Crop Production and Energy
- Ammonia Research since 1985, (Band spreaders) / Biogas since 1985
- Ammonia Inventories 1995
- National Emission Inventory since 1999 in coop. vTI
- Member of Ammonia Expert Group 1997 and Agr. Panel
- Member of IPPC- TWG 1999

- National Emission Inventory (together with vTI)
- Projections for feasible Mitigation options



- European IPPC Directive (Council Directive 96/61 on Integrated Pollution Prevention and Control)
- Installations for the intensive rearing of poultry and pigs
- Establishment of “Reference Documents on Best Available Techniques” BREF, regularly updated
- Technical Working group managed by IPPC Bureau in Seville
- Inconsistencies in the methodology used in various Member States

Conclusions from BREF document concerning recommendations for future work (from BREF 2003)

General

Limited data available on:

- current emission and consumption levels
- performance of techniques to be considered in the determination of BAT,
- achievable reduction of emission and consumption levels
- economics
- noise, energy, waste water and waste more information is necessary to allow a full assessment of BAT

General (2)

Quality and quantity of data reported:

- Circumstances under which the data were gathered not comparable or not known
- partly or not at all comparable
- harmonised approach for description and assessment of techniques necessary

Missing scheme on comparable cost data reporting

Missing scheme on animal welfare assessment of housing systems

Monitoring necessary for specific areas where very little information was made available

Information from New Member States



- ➔ to establish data on housing systems in use in Europe
- ➔ to develop a consistent, online accessible system to describe housing systems as basis for the BREF revision
- ➔ to establish a transparent assessment system to classify housing systems taking into account economic and ecological aspects as well as animal health and welfare

- ➔ **Support for the Technical Working Group and the IPPC Bureau**

BAT SUPPORT – Status of the project



- ➔ Data on housing systems were collected and compiled
The report is available on www.ktbl.de/international activities
- ➔ First version of the documentation system is currently being tested
- ➔ Assessment system will be finalised until Summer 2009



- Online system which guides the user through the description of the housing system
- All relevant animal categories, techniques and modules are available allowing to describe a wide range of housing systems
- Performance data (figures or ranges) can be added
- Result: Harmonised, comparable description in a predefined format, saved as PDF (or re-loadable XML in the process of work).



BAT-Support

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User information

▸ Start documentation

Upload

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▸ Description of housing systems for pigs and poultry

Start Information Process

User information

Start documentation

Upload from saved XML-File

Select housing system

1. Animal category:

2. Type of production:

3. Category of housing system:

Short description of housing system

Name of housing system:

Brief description:

- Please select
- Fully slatted floor system
- Plane floor system with bedding and yard
- Slatted floor system with drained area
- Plane floor system with bedding and drained area



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▸ Technique modules

Describe your housing system by selecting a specification for every module which is part of the system. It is not necessary to select a module which is not part of the housing system, e. g. bedding or spreading technique for bedding in a slurry-based system. Those modules can be left out.
For every specification you select it is possible to give a short remark if necessary.

Detailed information

Technique module | Performance | Related information | Download

Module	Select specification	Remarks
Housing type/Building construction	Please select	
Yard	Please select closed housing, poorly/ uninsulated	
Ventilation system	closed housing, well insulated combined with a yard	
Group size	Kennel housing open climate housing	
Pen design	Please select	
Floor type	Please select	
Manure system	Please select	
Type of bedding	Please select	
Spreading technique bedding	Please select	
Frequency of spreading	Please select	
Manure collection	Please select	
Frequency of scraping	Please select	
Indoor storage time	Please select	
Feed provision	Please select	
Feeding regime	Please select	
Feeding phases	Please select	
Nutrient composition	Please select	



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▶ Performance

In this form for performance data you can fill in emission data, data for resource demand and cost data. It is possible to give one value and/or a range, which is typical for the housing system described.

In addition it is possible to give measures for reducing emissions or resources and their reduction potential in %.

At the end some data about the animal performance and the feed is asked.

The quality of the data can be defined as:

- Measured data
- Derived from measurements
- Modelled figures
- Conclusion by analogy

It is possible to add some literature, where the data is from.

Detailed information

- Technique module
- Performance
- Related information
- Download

Emission level	Value	Unit	Quality of data	Literature
Ammonia	<input type="text"/>	kg/(ap yr)	Please select	<input type="text"/>
	from: <input type="text"/> to: <input type="text"/>	kg/(ap yr)	Please select Measured data Derived from measurements Modelled figures Conclusion by analogy	<input type="text"/>
Methane	<input type="text"/>	kg/(ap yr)	Please select	<input type="text"/>
	from: <input type="text"/> to: <input type="text"/>	kg/(ap yr)	Please select	<input type="text"/>
Nitrous oxide	<input type="text"/>	kg/(ap yr)	Please select	<input type="text"/>
	from: <input type="text"/> to: <input type="text"/>	kg/(ap yr)	Please select	<input type="text"/>
Odour	<input type="text"/>	OU/(LU s)	Please select	<input type="text"/>
	from: <input type="text"/> to: <input type="text"/>	OU/(LU s)	Please select	<input type="text"/>
Particulate matter	<input type="text"/>	kg/(ap yr)	Please select	<input type="text"/>
	from: <input type="text"/> to: <input type="text"/>	kg/(ap yr)	Please select	<input type="text"/>
Resource demand	Value	Unit	Quality of data	Literature
Amount of bedding material	<input type="text"/>	kg/(ap yr)	Please select	<input type="text"/>
	from: <input type="text"/> to: <input type="text"/>	kg/(ap yr)	Please select	<input type="text"/>
Energy	<input type="text"/>	kWh/(ap yr)	Please select	<input type="text"/>
	from: <input type="text"/> to: <input type="text"/>	kWh/(ap yr)	Please select	<input type="text"/>

Assessment system – basic ideas



- development of a **simple, structured and comprehensive assessment and rating system** for the main environmental effects of techniques applied in livestock farming
- based on the documentation system (WP 5)
- considering **cross-media effects** (scoring system)
- **based on** the methodology published in the **BREF** “Intensive Livestock Farming” (ILF 2003)
 - using similar criteria
 - evaluation against a reference system
- **resuming** the approach of the German study “**National evaluation for animal housing systems in Germany**”
 - qualitative evaluation of main indicators and influencing factors (quantitative data are often missing and/or are very variable)
 - = kind of a simplified emission model

Qualitative assessment of environmental impacts - Criteria



Indicator	Technique module	Emission relevant factor / "emission potential increasing with..."	Factor specification	rating	Reference	Assessed system
					FSF small group	
Ammonia / Odour					7	4
PM (PM ₁₀)					5	6
Methane					5	5
Nitrous oxide					10	10
N-/P-losses					-	-
Energy demand					5	3
Water demand					3	3
Total Sum					35	31

- rating of all relevant indicators
- all indicators are weighted equally important (scaled) by a factor
- the factors can be adapted if some indicators should be more or less important than assumed

→ evaluation system as proposed is harmonized with the animal health and welfare assessment (WP 7)

Qualitative assessment of environmental impacts (Example Ammonia)



Indicator	Technique module	Emission relevant factor / “ <i>emission potential increasing with...</i> ”	Factor specification	rating	Reference	Ass-essed system
					FSF small group	
Ammonia / Odour	Building construction / ventilation system	... rising indoor temperature level	low – outdoor induced climate, natural ventilation	0	1	0
			medium – insulated housing, forced ventilation	1		
			high – uninsulated housing, forced ventilation	2		
	Pen design	... increasing emitting surface area due to small groups / unstructured flooring	large group – multi area pen, separate dunging area; individual housing with fixation (sows only)	0	2	1
			large group – single area pen, no separate dunging area	1		
			small group - multi area pen, separate dunging area	1		
			small group - single area pen, no separate dunging area	2		
	Manure removal frequency	... increasing indoor manure storage time	no storage or daily removal	0	2	1
			storage time ≤ 2 months	1		
			storage time > 2 months	2		

Summarizing the environmental assessment (draft proposal)



- most techniques will not be “best” for all indicators
- some kind of categorization will be necessary in order to consider cross-media effects

Assessment result	BAT category
Prerequisite for BAT (= knock-out criterion): reduced ammonia emissions compared to the reference system (RS)	
+ total sum of all other indicators and all single indicators rated equal to or better than RS	A (***)
+ total sum of all other indicators rated equal to or better than RS, but not all of them	B (**)
+ total sum of all other indicators rated inferior to RS, but at most three of them	C (*)

→ Category C = conditional BAT, e. g. depending on site conditions?

Assessment of economic performance / costs of emission reduction

Costs	Reference system	BAT System
Investments		
<i>yearly cost (depreciation, interest, repairs)</i>		
Direct costs		
Personnel costs		
Benefits (products)		
Costs (per unit product / AP etc)		
Emissions		
Emission reduction		
		Costs of emission reduction

BAT SUPPORT – Outlook



- The documentation and assessment system will be available at the end of the project's lifetime in August 2009
- KTBL and the IPPC are currently discussing the way the BAT SUPPORT results can be used for the work of the TWG

Assessment of animal welfare - Criteria example fattening pigs

- Space/ Social interaction/ Locomotion
- Pen design/ Comfort behaviour
- Foraging material/ Exploration
- Movement facilities/ Handling
- Design/ Comfort behaviour

Assessment of animal welfare - Criteria example fattening pigs

Criteria	Technique module	Animal welfare relevant factor / "animal welfare increasing with..."	Factor specification	rating
Space, Social interaction Locomotion	Space provided and arrangement	... unobstructed floor area available for each	<ul style="list-style-type: none"> up to 10 kg: 0,15 m² >10-20 kg: 0,20 m² >20-30 kg: 0,30 m² >30-50 kg: 0,40 m² >50-85 kg: 0,55 m² >85-110 kg: 0,65 m² >110 kg: 1,00 m² ^{A)} 	0
			<ul style="list-style-type: none"> 10% more space ^{B)} 	1

A) Council Directive 2001/88/EC of 23 October 2001

B) Expert judgment

Assessment of animal health - Criteria example fattening pigs

- Epidemics / epidemical diseases
- Ectoparasites
- Endoparasites / Internal parasites
- Enteric diseases
- Respiratory disease
- Diseases of the locomotor system
- Hospital pens