

# Wageningen UR Livestock Research

*Partner in livestock innovations*



Report 273

## EU-Welfare legislation on pigs

March 2010



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### Abstract

An inventory was performed of 1) the present  
situation regarding the implementation of  
Directive 2008/120/EC and 2) national  
government funded research related to the  
Directive. Floor design and Group housing of  
sows are the main themes for both the  
additional demands to the EU legislation and  
the national government funded research  
concerning the minimum standards for the  
protection of pigs.

### Keywords

EU legislation, research themes, pigs, welfare,  
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**Dit onderzoek is uitgevoerd binnen het Beleidsondersteunend onderzoek in het kader van LNV-programma Verduurzaming productie en transitie, thema Dierenwelzijn, projectnummer BO-07-011-067**

## **Preface**

European citizens are concerned about the welfare of our livestock. Their concerns regard, for example, that pigs are kept in barren, tight and boring housing conditions, where they suffer painful procedures such as castration and tail docking. The European Commission has till now responded by legislation for minimum standards of pig production. These standards, originally formulated in 1991, will soon be up for review. The direction this review will take, is yet unknown. However, an assessment of the current situation may help to anticipate future events. This report provides a brief overview of the EU pig welfare legislation, and its translation into the national legislation of member states. It also provides a glimpse of what national governments have funded recently regarding pig welfare research. The study could not have been carried out without the help of a large number of people across Europe, who have contributed by providing information on legislation or research. The project team is very grateful to them, and hopes that they also find this overview useful when developing their own priorities on the improvement of pig welfare.

Ir. P.W.J. Vriesekoop  
Director of Wageningen UR Livestock Research



## Samenvatting

In de EU Directive 2008/120/EC is de bestaande EU wetgeving beschreven ten aanzien van varkenswelzijn en herhaald tevens de intentie van de commissie om deze wetgeving te evalueren met behulp van wetenschappelijk onderzoek. Het Nederlandse ministerie van Landbouw, Natuur en Voedselkwaliteit heeft in afwachting van deze evaluatie aan Wageningen UR Livestock Research gevraagd een inventarisatie uit te voeren naar 1) de huidige situatie betreffende de implementatie naar de nationale wetgeving van de EU lidstaten van Directive 2008/120/EC en 2) de onderzoeksonderwerpen van de afgelopen vijf jaar betreffende varkenswelzijn gerelateerd aan de eerder genoemde Directive dat gefinancierd is door de nationale regeringen van de EU lidstaten. Om de benodigde informatie te verkrijgen van de EU lidstaten is er een enquête verstuurd naar medewerkers van de nationale regeringen en/of naar welzijnsonderzoekers. Vrijwel alle lidstaten, behalve twee relatief nieuwe lidstaten, hebben de wetgeving van Directive 2008/120/EC geïmplementeerd in hun eigen wetgeving. Enkele landen hebben aanvullende eisen betreffende het dierenwelzijn van het varken. De belangrijkste thema's voor aanvullende eisen zijn vloeroppervlak, vloerontwerp/uitvoering en groepshuisvesting van zeugen.

De regeringen van meer dan de helft van de lidstaten financieren welzijnsonderzoek bij varkens. De specifieke details en de motivaties voor het toekennen van onderzoeksgeld aan bepaalde onderwerpen blijven onbekend. Het lijkt er echter op dat de EU lidstaten het varkenswelzijnsonderzoek vooral richten op: Groepshuisvesting van zeugen, hokverrijking, vloeruitvoering, castratie en kraamhokken. De auteurs van dit rapport concluderen voorzichtig dat groepshuisvesting is geïmplementeerd, maar niet beoordeeld is op implementeerbaarheid, dat castratie mogelijk een onderwerp is dat toegevoegd gaat worden aan de EU wetgeving en dat de lidstaten enigszins afwachtend zijn met het veranderen van de wetgeving met betrekking tot kraamhokken en staarten couperen.



## Summary

EU Directive 2008/120/EC describes the existing EU pig welfare legislation, and repeats the intention of the Commission to evaluate the legislation on the basis of scientific evidence. In anticipation of this review, the Dutch ministry of Agriculture, Nature and Food Quality asked Wageningen UR Livestock Research to describe the present situation regarding the translation of Directive 2008/120/EC into national legislation by the member states. Wageningen UR Livestock Research was also asked to list national government funded research on pig welfare issues related to the Directive, covering the past five years. A brief questionnaire was sent to government officials, welfare scientists or both to obtain the relevant information. Except for two relative new members, all states have implemented Directive 2008/120/EC in their legislation. A limited number of countries formulated stricter or additional demands to the EU legislation. Floor area, floor design and group housing of sows are the main themes with additional demands. Governments of more than half the member states fund research on pig welfare issues. The main themes are floor design, group housing, environmental enrichment, castration and farrowing pens. The authors cautiously conclude that group housing of sows is not challenged but implemented, that surgical castration may be an issue in future legislation, and that member states are interested but hesitant to change the rules on farrowing systems and tail docking of piglets.



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## 1 Introduction

Most of the EU member states have ratified Council Directive 2008/120/EC which replaces Council Directives 91/630/EEC, 2001/88/EC, 2001/93/EC and council Regulation 806/2003. Directive 91/630/EEC set the minimum standards for the protection of pigs and has been amended several times. Directive 2008/120/EC collates the existing legislation into one document, and repeats the Commissions intention to study the need for revision of the existing legislation based on scientific evidence collected since Directive 91/630/EEC (see article 7 of Council Directive 2008/120/EC). In anticipation of this review, the Dutch ministry of Agriculture, Nature and Food Quality (LNV) commissioned Wageningen UR Livestock Research to investigate two issues. Firstly, Wageningen UR Livestock Research has been asked to perform an inventory of the present situation regarding the implementation into national legislation of members states of Directive 2008/120/EC. Secondly, LNV asked for an inventory of national government funded research on pig welfare issues related to the Directive, covering the past five years.

This report presents the methods used during this enquiry and the results (in tables) of these inventories.

## 2 Material and method

The inventory into the implementation of the EU council Directive 2008/120/EC and the enquiry into research on pig welfare were performed via email and telephone. Most countries were approached through two contact persons; a researcher and a government official. Cyprus, Luxembourg, Malta and Portugal were not included in this inventory. Cyprus, Malta and Luxembourg were expected not to have additional legislation and not to have commissioned any research on pig welfare. Portugal has been excluded from this inventory due to a lack of response on this inventory.

The questions asked were:

- 1) Has your country introduced and implemented Council Directive 2008/120/EC (in particular articles 3 and 4)?
- 2) Has your country introduced, or is it planning to introduce, more stringent or alternative measures supplementary to Council Directive 2008/120/EC (articles 3 and 4)?
- 3) If so, can you indicate to us briefly what these measures entail? Can you forward us a copy (if necessary in your own language) of the relevant amendments and / or additions?
- 4) Has your government commissioned research concerning the welfare of pigs within the past 5 years?
- 5) If so, can you please describe in a few key words the purpose and outcomes of this research?

The answers from the respondents regarding the legislation are presented in the tables of Annex 1 of this document (attachment Table 1-8: Implementation of the legislation). The answers regarding the research effort can be found in Annex 2 (Research on pig welfare funded by national governments). The text of the report itself will provide an overview of these tables.

All information has been taken in good faith, which means that no attempt was made to verify the data provided with the help of other unrelated sources. However, following data collection and collation, a draft report was sent to all respondents with the request to check for mistakes. In a limited number of cases respondents were emailed or telephoned to clarify certain answers.

### 3 Results

#### 3.1 Overview of the implementation of the legislation

Table 1 in Annex 1 lists the national legislation studied for each member state. All member states except Hungary and Romania have implemented EU council Directive 2008/120/EC. In both Hungary and Romania the implementation is in progress. They are an EU member state since 2004 and 2007, respectively. In this chapter the relevant articles of the Directive will be presented, as well as for each of the articles the countries which require stricter provisions for the protection of pigs.

Article 3.1 Minimum unobstructed floor space per weaner and rearing pig

*The unobstructed floor area available to each weaner or rearing pig kept in a group, excluding gilts after service and sows, must be at least:*

Live weight (kg)	m <sup>2</sup>
Not more than 10	0.15
More than 10 but not more than 20	0.20
More than 20 but not more than 30	0.30
More than 30 but not more than 50	0.40
More than 50 but not more than 85	0.55
More than 85 but not more than 110	0.65
More than 110	1.00

See Table 2 of Annex 1. Germany, The Netherlands and Sweden demand a minimum unobstructed floor space for weaners and rearing pigs greater than that required in the EU legislation. However Germany demands a greater minimum space for pigs heavier than 20 kilogram. Austria demands a greater minimum space only for weaners less than 10 kg and rearing pigs from 85-110 kg.

Article 3.1.b. Minimum unobstructed floor space per boar, gilt after service and farrowing sow

*The total unobstructed floor area available to each gilt after service and to each sow when gilts and/or sows are kept in groups must be at least 1.64 m<sup>2</sup> and 2.25 m<sup>2</sup> respectively.*

*When these animals are kept in groups of fewer than six individuals the unobstructed floor area must be increased by 10 %. When these animals are kept in groups of 40 or more individuals the unobstructed floor area may be decreased by 10 %.*

See Table 3 of Annex 1. In Austria, Germany, Denmark, Sweden and The Netherlands, the minimum unobstructed floor space requirement per gilt is greater than that demanded in the EU legislation. The minimum unobstructed floor space is dependent on group size. In the Netherlands there are no extra demands for sows in groups as in Austria, Denmark and Sweden. Germany and Austria have only very limited extra demands (for example 2.5 instead of 2.475) and 2.05 instead of 2.025.

Article 3.2.a. Continuous solid floor and maximum drainage opening

*For serviced gilts and pregnant sows: part of the area required in paragraph 1(b), equal to at least 0.95 m<sup>2</sup> per gilt and at least 1.3 m<sup>2</sup> per sow, must be of continuous solid floor of which a maximum of 15 % is reserved for drainage openings;*

See Table 4 of Annex 1. In Denmark and the Netherlands the requirement for continuous solid floor space is greater for most pigs and the maximum drainage opening smaller than mentioned in the EU directive. In Denmark there is a transition period for existing buildings until July 1<sup>st</sup> 2015 (continuous solid floor for weaners and rearing pigs) and until July 1<sup>st</sup> 2013 (for continuous solid floor for individual crates for gilts after service and pregnant sows and for the maximum drainage opening). In Sweden there is a ban on fully slatted floors in all pig housing, drainage openings are not allowed. In Sweden, the farrowing pens must have a continuous solid floor area of at least 3 m<sup>2</sup>, a total floor area of at least 6 m<sup>2</sup> and the farrowing pens should be constructed in such a manner as to allow nesting behaviour. In Germany, rearing pigs are required to have at least 50% continuous solid floor. While Germany demands concerning continuous solid floors and maximum drainage openings for other pigs are equal to EU legislation.

Article 3.2.b. Maximum gap and slat width.

*When concrete slatted floors are used for pigs kept in groups:*

*(i) the maximum width of the openings must be:*

- 11 mm for piglets,*
- 14 mm for weaners,*
- 18 mm for rearing pigs,*
- 20 mm for gilts after service and sows;*

*(ii) the minimum slat width must be:*

- 50 mm for piglets and weaners, and*
- 80 mm for rearing pigs, gilts after service and sows.*

See Table 5 of Annex 1. Dutch legislation demands a maximum gap width of 10 mm for concrete slatted floors for piglets in stead of the EU maximum of 11 mm. The Netherlands also has a maximum gap width for slatted floors constructed from other materials than concrete for piglets, weaners and rearing pigs. In Austria the gap width for piglets and weaners is one mm smaller than the demands in the EU legislation, but there is a transition period for this demand until 2020.

Article 3.3. Tethering sows and gilts

*From 1 January 2006 the use of tethers for sows and gilts shall be prohibited.*

See Table 6 of Annex 1. In Sweden regulations demand that sows are not tethered, even in farrowing pens and that the farrowing pens should be constructed to allow nesting behaviour. Also in the UK tethering of sows and gilts is forbidden and it is forbidden to keep non lactating sows in stalls for 4 weeks after service.

Article 3.4. Group housing of pregnant sows and gilts

*Sows and gilts are kept in groups from four weeks after service to one week before the expected time of farrowing. The pen where the group is kept must have sides/walls/partitions greater than 2.8 m in length. When fewer than six individuals are kept in a group the pen where the group is kept must have sides greater than 2.4 m in length. By way of derogation from the first subparagraph, sows and gilts raised on holdings with fewer than 10 sows may be kept individually during the period mentioned in that subparagraph, provided they can turn around easily in their boxes.*

See Table 6 of Annex 1. In the UK non lactating sows should be kept in groups and there is no exception for 4 weeks after service. In Sweden sows and gilts should always be housed in groups, except farrowing sows and sows one week before farrowing. In The Netherlands sows and gilts should be kept in groups starting from 4 days after service until one week before farrowing, instead of from four weeks after service.

Instead of 2.8 m in Denmark the pen size has to be 3.0 m in length at least.

Article 3.5. Manipulable material

*Sows and gilts should have permanent access to manipulable material.*

See Table 6 of Annex 1. Only Sweden has an extra demand for nesting material for farrowing sows and gilts and that all pigs should have access to straw. Austria and Germany mention in their legislation that the material should be harmless and enough.

Article 3.6. Each individual sufficient food

*Sows and gilts kept in groups are fed using a system which ensures that each individual can obtain sufficient food even when competitors are present.*

See Table 6 of Annex 1. Sweden has demands on minimum eating space per pig, depending on the weight and size of the pigs. Other EU countries have no extra demands on supply of sufficient food.

Article 3.7. High fibre/ high energy food for dry pregnant sows and gilts

*All dry pregnant sows and gilts, in order to satisfy their hunger and given the need to chew, are given a sufficient quantity of bulky or high-fibre food as well as high-energy food.*

See Table 6 of Annex 1. Germany demands that dry pregnant sows and gilts are fed at least 8% dry matter or 200 gram high fibre. This demand is more specific than the EU regulation.

Article 3.8. Sick bay for diseased and injured pigs

*Pigs that have to be kept in groups, that are particularly aggressive, that have been attacked by other pigs or are sick or injured may temporarily be kept in individual pens. In this case the individual pen used shall allow the animal to turn around easily if this is not in contradiction with specific veterinary advice.*

See Table 6 of Annex 1. Denmark has specific demands for sick bays for diseased animals or those requiring special attention (>2.8 m<sup>2</sup>/ animal, minimum pen area: >3.5m<sup>2</sup> and total solid floor, 0.95 m<sup>2</sup>/ gilt and >1.3 m<sup>2</sup>/sow).

Article 4.1 Noise

*In the part of the building where pigs are kept continuous noise levels as loud as 85 dBA shall be avoided. Constant or sudden noise shall be avoided.*

See Table 7 of Annex 1. Only Sweden has a maximum level for continuous noise that is lower than that recommended in the EU legislation. In Germany the aim is to keep the noise level be as low as possible.

Article 4.2 Light,

*Pigs must be kept in light with an intensity of at least 40 lux for a minimum period of eight hours per day.*

See Table 7 of Annex 1. Austria, Belgium, Germany and Sweden all have stricter demands concerning light than the EU. In Austria daylight requirements have to be fulfilled when pigs do not have access to an outdoor run. In Belgium and Sweden daylight is an essential requirement. In Germany light intensity should be 80 lux for more than 8 hours per day and there should be daylight access.

Article 4.3 Climate and laying area

*Pig accommodation must be constructed in such a way as to allow the animals to:*

- *have access to a physically and thermally comfortable lying area that is adequately drained and clean which allows all the animals to lie at the same time,*
- *rest and get up normally,*
- *see other pigs; however, in the week before the expected farrowing time and during farrowing, sows and gilts can be kept out of the sight of conspecifics.*

See Table 7 of Annex 1. Bulgaria has more specific demands for climate and laying area than demanded in the EU decree. Also Sweden has more specific demands for air quality in the pig facilities (e.g.) maximum quantities (ppm) for NH<sub>3</sub>, CO<sub>2</sub>, and H<sub>2</sub>S and relative humidity and a maximum concentration (mg/m<sup>3</sup>) of dust particles. In Denmark all pigs but the ill and injured pigs should be able to see other pigs.

Both Belgium and Denmark demand provision of extra shelter for outdoor pigs.

Additional to the EU legislation, Denmark demands a misting (vaporizer) system for pregnant sows and gilts in loose housing systems, for pigs heavier than 20 kg.

Article 4.4 Providing material to enable investigation and manipulation

*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.*

See Table 7 of Annex 1. Only in Denmark there is a more specified demand for access to rooting material on the floor.

Article 4.5. Smooth but no slippery floors, suitable for size and weight of pigs

*Floors must be smooth but not slippery so as to prevent injury to the pigs and so designed, constructed and maintained as not to cause injury or suffering to pigs. They must be suitable for the size and weight of the pigs and, if no litter is provided, form a rigid, even and stable surface.*

See Table 8 of Annex 1. None of the countries have additional demands concerning this topic.

Article 4.6. Feeding at least once a day

*All pigs must be fed at least once a day. Where pigs are fed in groups and not ad libitum or by an automatic individual feeding system, each pig must have access to the food at the same time as the others in the group.*

See Table 8 of Annex 1. None of the countries have additional demands concerning this topic.

Article 4.7. Pigs > 2 weeks: fresh water

*All pigs over two weeks of age must have permanent access to a sufficient quantity of fresh water.*

See Table 8 of Annex 1. Austria, Germany and Sweden demand that all pigs should have permanent access to a sufficient quantity of fresh water.

Article 4.8. Interventions

*All procedures intended as an intervention carried out for other than therapeutic or diagnostic purposes or for the identification of the pigs in accordance with relevant legislation and resulting in damage to or the loss of a sensitive part of the body or the alteration of bone structure shall be prohibited with the following exceptions:*

- *a uniform reduction of corner teeth of piglets by grinding or clipping not later than the seventh day of life leaving an intact smooth surface; boars' tusks may be reduced in length where necessary to prevent injuries to other animals or for safety reasons,*
- *docking of a part of the tail,*
- *castration of male pigs by other means than tearing of tissues,*
- *nose-ringing only when the animals are kept in outdoor husbandry systems and in compliance with national legislation.*

*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.*

*Any of the procedures described above shall only be carried out by a veterinarian or a person trained as provided in Article 6 and experienced in performing the applied techniques with appropriate means and under hygienic conditions. If castration or docking of tails is practised after the seventh day of life, it shall only be performed under anaesthetic and additional prolonged analgesia by a veterinarian.*

See Table 8 of Annex 1. In Denmark clipping of teeth is forbidden, only grinding is allowed within the first four days. Tail docking is only allowed at day 2-4 and no more than half of the tail. In Denmark castration only allowed at day 2-7. In Sweden tail docking and nose ringing is forbidden, piglets should not be weaned younger than 4 weeks and also pigs younger than 2 weeks of age must have permanent access to a sufficient quantity of fresh water. In Austria nose ringing is forbidden, also in the outdoor system.

### **3.2 Summary of the implementation of the legislation**

To summarize the data Table 1 lists the EU member states which have additional demands above the regulations mentioned in Council Directive 2008/120/EC.

More than two EU countries have extra demands concerning: a) the minimum unobstructed floor space (weaner and rearing pigs), b) the minimum unobstructed floor space per boars, gilts (after service) and farrowing sows, c) group housing of pregnant sows and gilts, d) manipulable material, e) the minimum amount of light in the pig housing, f) climate and laying area, g) permanent access to fresh water and h) mutilations (all for a different reason) (see table 1).

**Table 1.** Countries with additional demands to the regulations mentioned in Council Directive 2008/120/EC (requirements are only mentioned when more than two countries have additional demands)

Requirement	Countries with limited additions*	Countries with substantial additions*
Minimum unobstructed floor space (weaner and rearing pig)	AU	D, NL, S
Minimum unobstructed floor space (boar, gilt after service and sow)	AU, D	DK, NL, S
Continuous solid floor and maximum drainage openings		DK, D, NL, S
Group housing of pregnant sows and gilts	DK	UK, S, NL
Manipulable material	AU, D, S	
Minimum amount of light		AU, B, D, S
Climate and laying area	BU, B, S	DK
Permanent access to fresh water	AU, D, S	
Mutilations		AU, DK, S

\* AU = Austria, B = Belgium, BU = Bulgaria, DK = Denmark, D = Germany, NL = The Netherlands, S = Sweden, UK = United Kingdom

## 4 Overview and summary of the research on pig welfare

Table 9 in Annex 2 lists the research on pig welfare funded by national governments for each member state.

Based on the data received we conclude that more than 50% (15) of the countries which took part in the inventory perform research on pig welfare, funded by their national government. Eight countries do not.

In Table 2 the results are shown of the inventory of research subjects carried out in the EU-member states. Research on group housing has been performed or is on-going in eight different countries. Also research on environmental enrichment and floor design has been performed or is on-going in eight different countries. Floor design has been or is an on-going topic of research in seven different countries. Castration has been or is under current investigation in seven different countries. Research on farrowing pens has been performed or is on-going in six countries. Two countries have concentrated their research on lameness, mutilations, water supply, high fibre in the diet or lameness. In table 2 the results are shown of the inventory of research subjects on pig welfare in the EU.

Two countries have indicated that the government is not the authority that prioritizes research subjects. In Sweden the authorities (e.g. the National board of agriculture) and the independent national research councils administer funding from the government. In Ireland, independent research councils submit proposals for government funded research. It would seem that in Ireland research subjects are not dictated by the Irish government.

**Table 2** National government funded pig welfare research, performed or in progress within the EU.

Research subject	Countries with completed research*	Number of countries with completed research	Countries where research is still on-going*	Number of countries with research still on going
Group housing Sows	CZ, SF, IRE, NL, SP, UK	6	B, F, NL	3
Housing systems fattening pigs	BU, NL, UK	3	NL	1
Environmental enrichment	DK, SF, IRE, I, NL, UK	7	DK, F	2
Castration	F, IRE, I	3	B, F, NL, S, SP	5
Floor design	SF, IRE, I, NL, UK	5	F, D	2
Farrowing pens	AU, SF, IRE, UK	4	DK,D, UK	3
Water supply/management	BU, I	2		
High fibre diets	F, IRE	2		
Light	I	1		
Mutilations	IRE	1	NL	1
Lameness	S	1	SF	1
Cooling	I	1		

\* AU = Austria, B = Belgium, DK = Denmark, CZ = Czech republic, SF = Finland, F = France, D = Germany, IRE = Ireland, I = Italy, LT = Lithuania, NL = The Netherlands, S = Sweden, SP = Spain, UK = United Kingdom

## 5 Conclusions and discussion

Most EU member states have implemented the EU legislation mentioned in Council Directive 2008/120/EC and some countries have additional demands to the EU legislation concerning the minimum standards for the protection of pigs. Floor area, floor design and group housing of sows are the main themes with additional demands.

Research financed by the national governments also shows the interest of these governments for floor design. The North West European countries also place emphasis on research into group housing, environmental enrichment, castration and farrowing pens.

The study does not allow us to conclude on what the main issues are for funding research in the different EU countries. Among the reasons for funding could be the need to specify EU requirements, the need for information to support implementation of regulations, or a need to develop alternative strategies than those specified in the legislation. This inventory can be used to indicate areas of mutual interest by different member states.

The specific details and motivations for funding remain largely unknown, but it seems that research in the EU member states is concentrating on:

1. Group housing of sows,
2. Environmental enrichment,
3. Floor design,
4. Castration
5. Farrowing pens

Given the current state of knowledge and taking into account the implementation of EU legislation into national legislation, the authors believe that

- a. Research on Group housing of sows and Environmental enrichment is motivated by inability to comply effectively with the current EU legislation, or by questions raised by the farming community
- b. Research on Castration is possibly motivated by a need to understand the possibilities of meeting additional requirements through market forces or national legislation.
- c. Research on Floor design is probably requested by authorities concerned about problems occurring within pig husbandry. There is little incentive yet (due to costs) to tighten legislation on this.
- d. Research on Farrowing pens is probably initiated because of scientific and NGO concern. There are only a few signs that member states are including stricter measures on this in their legislation.

Based on this inventory we cautiously conclude that the authorities expect changes in demands on the subjects of Castration due to market demands or due to the forthcoming review of the EU legislation. The subject of group housing is possibly not challenged but implemented. Changing regulation on Farrowing pens is probably asked for but members states are hesitant to change it. The subject of Environmental Enrichment is more difficult to interpret. The continued effort to solve the tail docking issue despite the lack of practical results may imply a desire to substantiate a removal of the EU ban on tail docking, or in contrast be a genuine attempt to make it possible to stop docking, and does enforce the current legislation (e.g. by legislating for straw or toy use).

## **6 Acknowledgements**

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## Appendices

### ANNEX 1: Tables implementation of the legislation

**Table 1:** Directive per country

Country	Directive
Austria	1. Tierhaltungsverordnung BGBl. II Nr. 485/2004 idF BGBl. II Nr. 530/2006
Belgium	Koninklijk Besluit betreffende de bescherming van varkens in varkenshouderijen datum
Bulgaria	Directive N21/14.12.2005 (en volgens mij (MM) gewijzigd op 1-5-2006)
Cyprus	EXCLUDED
Czech Republic	Council directive 2008/120/EC; 208/2004 Coll. Decree (14 april 2004) Amended by 425/2005 Coll. Decree (11 Oct 2005) Act No.246/1992 Coll. on the protection of animals against cruelty. § 7
Denmark	Act on protection of Animals (Dyregaernsloven) 1991. Act no. 404 (1998), Act no. 104 (2000), Act no. 173 (2001), Order no. 323 (2003), Order no. 324 (2003)
Estonia	Animal Protection Act
Finland	Eläinsuojeluasetus 396/1996 (changed November 7, 2002, 910/2002. Maa- ja metsätalousministeriön asetus sikojen pidolle asetettavista eläinsuojeluvaatimuksista 14/EEO/2002.
France	Arrêté du 16 janvier 2003 établissant les normes minimales relatives à la protection des porcs (JORF du 22/01/2003)
Germany	Dritten Verordnung Tierschutz-Nutztierhaltungsverordnung abschnitt 4 (22-8-2006)
Greece	Unknown
Hungary	EXCLUDED: implementation into national legislation in progress
Ireland	Statutory Instrument No. 71 (2009)
Italy	Decreto Legislativo 20 febbraio 2004, n. 53
Latvia	Republic of Latvia Cabinet Regulation No. 743 Adopted 7 July 2009 "Pig Welfare Requirements" The requirements of pig housing (confirmed by order of the director of The State Food and Veterinary Service 22-12-2000; edit 14-01-2003) The requirements of welfare of Household animals (confirmed by order of the director of The State Food and Veterinary Service 16-05-2002)
Lithuania	
Luxembourg	EXCLUDED
Malta	EXCLUDED
Netherlands	Varkensbesluit en Ingrepbesluit
Poland	Regulation of Minister of Agriculture and Rural Development from 24.IV.2009
Portugal	EXCLUDED: no data could be obtained
Romania	EXCLUDED: implementation into national legislation in progress
Slovakia	Ordinance of the Government of the Slovak Republic No 735/2002 Coll.
Slovenia	Unknown
Spain	Real Decreto 1135/2002, de 31 de octubre, relativo a las normas mínimas para protección de cerdos.
Sweden	Swedish Animal Welfare Act 1988:534 amended SFS 2007:362 (18 juni 2007)
United Kingdom	The Welfare of Farmed Animals (England) Regulations 2007 No. 2078 The Mutilations (Permitted Procedures) (England) Regulations 2007

**Table 2:** Minimum unobstructed floor area per weaner and rearing pig kept in a group (per live weight category in m<sup>2</sup>) excluding gilts after service (article 3.1a).

Country	Live weight (kg)							
	< 10	10-15	15-20	20-30	30-50	50-85	85-110	> 110
EC Directive	5-10: 0.15	0.2	0.2	0.3	0.4	0.55	0.65	1.0
Austria <sup>1)</sup>	0.2						0.7	
Belgium								
Bulgaria								
Czech Republic								
Denmark								
Estonia								
Finland								
France								
Germany				0.35	0.5	0.75	0.75	
Greece								
Ireland								
Italy								
Latvia								
Lithuania								
Netherlands <sup>2)</sup>	0.2		0.4	0.4	0.6	0.8	1.0	1.3
Poland								
Slovakia								
Slovenia								
Spain								
Sweden <sup>3)</sup> (deep litter pen)	0.25 (0.32)	0.28 (0.38)	0.32 (0.44)	0.40 (0.56)	0.55 (0.80)	0.82 (1.00)	1.02 (1.51)	1.18 (1.75)
United Kingdom								

<sup>1)</sup> Comment: no reduction permitted

<sup>2)</sup> The unobstructed floor area per pig can be reduced by 10% when weaner or rearing pigs are kept in groups of 40 or more.

<sup>3)</sup> The minimum area in Sweden is  $0.17 + \text{weight (kg)}/130$  (weaner and rearing pig 10-130 kg). The minimum area for weaner and rearing pigs (10-130 kg) =  $0.20 + \text{weight (kg)}/84$ .

**Table 3:** Minimum unobstructed floor area per boar, gilt after service and (farrowing) sow (Annex 1 Hd II, article 3 1b).

Country	Boar		Gilt			Sow		
	(pen)	(pen and service area)	<6 per group	6-40 per group	>40 per group	<6 per group	6-40 per group	>40 per group
EC Directive	6	10	1.804	1.64	1.476	2.475	2.25	2.025
Austria			1.85	1.65	1.5	2.5		2.05
Belgium								
Bulgaria								
Czech Republic								
Denmark			First 10 gilts: 1.90 m <sup>2</sup> 11 <sup>th</sup> -20 <sup>th</sup> gilt: 1.70 m <sup>2</sup> 21 <sup>th</sup> gilt or more: 1.50 m <sup>2</sup>			First 17 sows: 1 <sup>th</sup> -4 <sup>th</sup> sow: 2.80 m <sup>2</sup> ; 5 <sup>th</sup> -10 <sup>th</sup> sow: 2.2 m <sup>2</sup> ; 11 <sup>th</sup> -17 <sup>th</sup> sow: 2.00 m <sup>2</sup> ≥ 18 sows: EC		
Estonia								
Finland								
France								
Germany			1.85	1.65	1.5	2.5		2.05
Germany								
Greece								
Ireland								
Italy								
Latvia								
Lithuania								
Netherlands	6 (>18m)		2.475	2.25	2.025			
Poland								
Slovakia								
Slovenia								
Spain								
Sweden (deep litter pen)	7 (7)		1.81 (a)	EC (a)	1.64 (a)	2.48 (2.5)	EC (2.5)	2.25 (2.5)
United Kingdom								

(a) Minimum solid floor area = 0.10 + weight (kg)/ 167

**Table 4:** Continuous solid floor area (per animal category) and maximum drainage openings (%) (Annex 1 Hd II C, article 3 2a).

Country	Piglets	Weaner	Rearing pig	Gilt after service	Pregnant Sow	Farrowing sow	Max. drainage openings
	m <sup>2</sup> per litter						
EC Directive	Sufficient to rest together	0	0	0.95 m <sup>2</sup>	1.30 m <sup>2</sup>		15%
Austria	Recommendation: 0.7 m <sup>2</sup> up to 4 weeks of age						
Belgium							
Bulgaria							
Czech Republic							
Denmark		50% <sup>2)</sup>	33% <sup>2)</sup>	EU or when in individual crates: >90 cm long measured from the rear of the trough <sup>3)</sup>	EU or when in individual crates: > 90 cm long measured from the rear of the trough <sup>3)</sup>		10% <sup>3)</sup>
Estonia							
Finland							
France							
Germany <sup>1)</sup>	EC and get milk together		50%				
Greece							
Ireland							
Italy							
Latvia							
Lithuania							
Netherlands <sup>4)</sup>	0.6 m <sup>2</sup>	Concrete: 40% Other: 0%	40%	1.30 m <sup>2</sup>		Concrete: 40% Other: 0%	5%
Poland							
Slovakia							
Slovenia							
Spain							
Sweden	Farrowing pens must at least have 3m <sup>2</sup> solid floor area	a)	a)	0.9 (differ from EU while no drainage openings are allowed)	1.1 (differ from EU while no drainage openings are allowed)	3 m <sup>2</sup> (Farrowing pens must be at least 6 m <sup>2</sup> and constructed in such a manner as to allow nesting behavior)	No drainage opening Ban on fully slatted floor.
United Kingdom							

<sup>1)</sup> Gilts and sows individually housed should have a continuous floor at places where is absence of spoiled feed, dung or urine.

<sup>2)</sup> Solid or drained floor or a combination of solid and drained floor. Transitional period for existing buildings until 1 July 2015

<sup>3)</sup> Transitional period for existing buildings until 1 January 2013

<sup>4)</sup> From a moment to determine by Koninklijk Besluit the solid area has to be 56-60% (Varkensbesluit article 5.4)

a) Minimum solid floor area = 0.10 + weight (kg)/ 167

**Table 5:** Maximum width of gaps (mm) and minimum slat width (mm) when concrete slatted floors are use (article 3 2b).

Country	Gap width (mm)				Slat width (mm)	
	Piglets	Weaner	Rearing pig	Gilts after service, sow	Piglets, weaners	Rearing pigs, gilts after service, sows
EC Directive	11	14	18	20	50	80
Austria	10 <sup>3)</sup>	13 <sup>3)</sup>				
Belgium						
Bulgaria						
Czech Republic						
Denmark <sup>1)</sup>						
Estonia						
Finland						
France						
Germany						
Greece						
Ireland						
Italy						
Latvia						
Lithuania						
Netherlands <sup>2)</sup>	10					
Poland						
Slovakia						
Slovenia						
Spain						
Sweden	EC for piglets < 9 kg	EC for weaner 9-25 kg	EC for rearing pigs 25-120 kg	EC for gilts after service and sows > 120 kg		
United Kingdom						

<sup>1)</sup> In Denmark this is only applied to fully slatted floors. There is no maximum when the floor is partly slatted.

<sup>2)</sup> In the Netherlands there are also maximum gap widths for non-concrete slatted floors: 12 mm for piglets, 15 mm for weaners, 20 mm for rearing pigs.

<sup>3)</sup> Transition period until 2020.

**Table 6:** article 3 (3-4).

Country	Art 3.3	Art 3.4	Art 3.4	Art 3.4
EC Directive	Tethering sows and gilts prohibited	Sows and gilts in groups starting at 4 weeks after service until 1 week before farrowing	Pen size sows and gilts >2.8 m in length (Groups <6: 2.4 m)	Derogation: holding with < 10 pigs; pigs maybe housed individually
Austria				Derogation: holding with < 10 pigs: These pens must allow animal to turn around
Belgium				
Bulgaria				
Czech Republic				
Denmark			3.0	
Estonia				
Finland				
France				
Germany				Derogation: holding with < 10 pigs: These pens must allow animal to turn around
Greece				
Ireland				
Italy				
Latvia				
Lithuania				
Netherlands		At 4 days after service until 1 week before farrowing		
Poland				
Slovakia				
Slovenia				
Spain				
Sweden	Sows and gilts must always kept loose (also in farrowing pens)	Sows and gilts always in groups (except sows and gilts 1 week before farrowing, and farrowing sows)		
United Kingdom	Since 1999 on unilateral basis! Forbidden to keep non lactating sows in stall for first 4 weeks after service	No exception for 4 weeks after service		

**Table 6:** article 3 (5-9).

Country	Art 3.5	Art 3.6	Art 3.7	Art 3.8	Art 3.9
EC Directive	Permanent access to manipulable material	Each individual sufficient food	Sufficient high-fibre and high-energy food for dry pregnant sows and gilts	Aggressive, sick and injured pigs in individual pens (these pens should allow the animal to turn around easily)	For newly built or rebuilt holdings: 1 January 2003. All holdings: 1 January 2013
Austria	Harmless and enough etc				
Belgium					
Bulgaria					
Czech Republic					
Denmark				> 2.8 m <sup>2</sup> / animal, minimum pen area: > 3.5 m <sup>2</sup> and solid floor, > 0.95 m <sup>2</sup> / gilt and > 1.3 m <sup>2</sup> /sow	
Estonia					
Finland					
France					
Germany	Harmless and enough etc		At least 8% DM or 200 g high fibre		new or rebuilt: 4 August 2006; in parts transition period
Greece					
Ireland					
Italy					
Latvia					
Lithuania					
Netherlands					
Poland					
Slovakia					
Slovenia					All buildings: Art 3.4 (1 Jan 2005), Art 3.5, 3.8 (6 May 2003)
Spain					
Sweden	1. Farrowing sows and gilts should have suitable nesting material in sufficient quantity in the week before the expected farrowing time. 2. All pigs should have access to straw	a)			
United Kingdom					

a) Minimum space (width) per pig in m: Weaners and rearing pigs = 0.164 + weight (kg) / 538; Gilt and small sow = 0.45; Other sows = 0.50

**Table 7:** article 4 (Annex 1. 1-4).

Country	1	2	3	4
EC Directive	Maximum for continuous noise level: 85 dBA	Light: at least 40 lux for $\geq 8$ hours per day	Comfortable area, all animals can lie at same time Rest and get up normally See other pigs (not week before farrowing or at farrowing)	Permanent access [...] to material to enable [...] activities
Austria		If no access to outdoor run: 3% floor space with daylight access in wall or roof		
Belgium <sup>1)</sup>		3% floor space with daylight access in wall or roof		
Bulgaria			Minimum requirements contain microclimatic parameters including content of harmful gases, ventilation conditions, humidity and minimum temperatures (piglets)	
Czech Republic				
Denmark*			See other pigs (not when isolated because of illness or injury)	Access to rooting material on the floor
Estonia				
Finland				
France				
Germany		80 lux for $\geq 8$ hours per day; 3% floor space with daylight in wall/roof (if not possible: 1.5%)		
Greece				
Ireland				
Italy				
Latvia				
Lithuania				
Netherlands				
Poland				
Slovakia				
Slovenia				
Spain				
Sweden	Max noise level: 65 dBA (or 75 dBA)	Building for pigs must have windows for natural light	Min. air quality requirements: <10 ppm NH <sub>3</sub> , <2000 ppm CO <sub>2</sub> , <0.5 ppm H <sub>2</sub> S, <80% RH, <10 mg/m <sup>3</sup> dust	
United Kingdom				

\* Denmark prescribes a provision for a misting/vaporizing system or the like for pregnant sows and gilts in loose housing systems and for weaner/breeder/slaughter pigs of > 20 kg and specific provisions for pigs kept in outdoor systems.

<sup>1)</sup> In Belgium outdoor pigs should have access to shelter to protect them against harsh weather conditions, predators and health risks (KB 1-mar-2000 protection of animals held for agricultural purposes).

**Table 8:** Article 4 (Annex 1. 5-8).

Country	5	6	7	8
EC Directive	Floors are smooth but not slippery. Suitable for size and weight of the pigs etc	Feeding at least once a day. ....(when group feeding then all access to food at same time	Pigs > 2 wks: permanent access to a sufficient quantity of fresh water	Interventions shall be prohibited. Exceptions: - reduction of teeth < 7 day - docking of a part of the tail - castration of male pigs - nose-ringing in outdoor system
Austria			EU requirement applies to ALL pigs	No exceptions for nose ringing in the outdoor system
Belgium				
Bulgaria				
Czech Republic				
Denmark				Ban on clipping of teeth, only grinding within first 4 days. Tail docking only at day 2-4 and no more than half of the tail. Castration only at day 2-7.
Estonia				
Finland				
France				
Germany		Is regulated for each kind of pig	EU requirement applies to ALL pigs	
Greece				
Ireland				
Italy				
Latvia				
Lithuania				
Netherlands				
Poland				
Slovakia				
Slovenia				
Spain				
Sweden <sup>1)</sup>			EU requirement applies to ALL pigs	Tail docking and nose ringing is forbidden
United Kingdom				

<sup>1)</sup> No piglets shall be weaned from the sow at less than 4 weeks of age

## ANNEX 2: Research on pig welfare funded by national governments

Land	RESEARCH Topics (completed)	RESEARCH Topics (on-going)
Austria	Effect of different farrowing pens on animal health, behaviour and performance	
Belgium		Castration Group housing sows
Bulgaria	Different breeds and its influence on growth and behaviour. Effect of management on sexual maturation and growth of two different breeds, research on group size, effect of drinking system, housing, effect of providing water to suckling piglets, effect of pigs reared individually and in groups.	
Denmark	Types of rooting material	Loose house farrowing. Types and amount of rooting material 1) 100 gram/straw per day in the finishing production also in partly slatted production systems ! 2) and loose sows in the lactation period. 1) Purpose: Measuring animal welfare with increase amount of straw pr. day. The outcome is uncertain (difficult to measure animal welfare) 2) Purpose: Creating a farrowing crate with loose sows, high lactation yield and minimum preweaning mortality. (Outcome under progress) Material to enable proper investigation and manipulation activities (Faculty of Agricultural Sciences at Aarhus University (2012)
Czech Republic	Research on maternal behavior of sows influencing the mortality and growth of nursed piglets in group and standard housing systems. Determination of repeatability of maternal behavior of sows. Research on factors influencing nursing frequency and subsequently the growth of nursed piglets in different housing systems, aimed at vocalisation of the animals. Research into the influence of social environment and social experience of pigs during ontogenesis on their later mutual aggressiveness	
Estonia	None	none
Finland	Project on the effects of maternal behavior on piglet welfare, effects of flooring material on skin lesions in sows and piglets, effects of previous experience on welfare of fattening pigs, effects of dry sow housing on reproduction and welfare  Some of the results: - litter use as an environmental enrichment early in life reduces abnormal behavior later in fatteners - when using individual feeding stalls for dry sows with minimum space allowances (the same as in the directive 2008/120/EC) there are more aggressive behavior in communal areas, more skin lesions and more serious infections (such as peritonitis) resulting from skin lesions, lower reproductive performance compared to sows in more spacious housing systems - farrowing occurs faster when sows can move freely during farrowing and oxytocine levels are higher compared to sows farrowing in farrowing crates	Ontogeny and background of tail biting in pigs. Lameness in pigs; the effect of treatment on their behavior The effect of parturition environment on the duration, behavior and endocrinology of the sows
France	Castration (use of local anaesthetic (lidocaine) with or without analgesia with ketofen. High fibre diets sows	Floor design growing pigs Environment enrichment of growing pigs (on-going). On-farm welfare assessment. Social organisation of small groups of pregnant sows Cooling and local anesthesia and analgesia around castration. Influence of testicular hormones
Germany		Impact of the percentage of floor contact area of a perforated floor in relation to the overall pen floor area on the general  Hindquarter and claw health as well as the behaviour of sows in te farrowing area with close confinement
Greece	None	None
Hungary	None	None

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Ireland	Effect of mats in farrowing house; influence of housing system during gestation; effect of loose housing during gestation and in farrowing crates; effect of floor types in farrowing crates; effect of enrichment in group housed sows with free access stalls; effect of two piglet teeth resection on welfare piglet; effects of surgical castration on behaviour; effect of enrichment on piglets in farrowing crates; effect of mixed and single sex groups and split marketing; effect of dietary fibre and access to straw on group housed sows; effect of restricted feeding at end of finishing period on gilts and entire male pigs; sows longevity.	Management and housing options for pig production systems using entire males; implications of low phosphorous diets on bone strength in finishing pigs
Italy	Straw bedding for weaned piglets (1999-2001); water management systems  Impact floor type on 'leg weakness' syndrom and osteocondrotic lesions for heavy pigs Cooling pregnant sows Light level Environmental enrichment for piglets; experimental analysis of cooling stations for sows Water management	Measurement of pain and use of anaesthesia and analgesia during castration of piglets
Letvia	None	None
Lithuania	The purpose of the study was to evaluate the effects of different growing technologies applied in Lithuania on pig health and welfare. Pigs were grown on deep litter, in pens with bedded lying areas, using litter-free technologies and also in premises with regulated micro environment, and the pig welfare data were analysed and compared.  The studies indicated that pig welfare demands were better satisfied when growing empty and pregnant sows, weaned piglets till 90 days of age and fattening pigs on deep litter in pens with higher floor area per animal if compared with growing on unbedded concrete-tiled floors. The comparison of pig growing in closed sections with the regulated microenvironment and in pig-houses without the microenvironment regulation indicated that from animal welfare view point pig growing is more favorable in pig-houses without the microenvironment regulation but with higher floor area per animal and bedded lying area.	none
The Netherlands	Environmental enrichment fattening pigs, housing of fattening pigs, enrichment lactating sows, group size	Tail docking, castration, group housing of sows during early pregnancy, alternative housing for fattening pigs and lactating and pregnant sows
Poland	During literature review they didn't found research on welfare topics	
Romania	None	None
Slovenia	None	None
Slowakia	None	None
Spain	Effect of housing and feeding system on welfare and productivity of pregnant sows	Improving piglet survival Alternatives to surgically castration in order to improve animal welfare and meat and carcass quality
Sweden	Housing systems for farm buildings-guide for planning pig housing systems (2008) Lameness in piglets (2009)	Reduction of pain at castration-effect of local anaesthesia and analgesia on behaviour and growth (2010) Effect of early immunocastration on boar taint, production and behaviour in entire male pigs (2010); Alternative to surgical castration in pigs-through enrichment of sperm doses with X-chromosome bearing spermatozoa (2012)
UK	Research concerns transport, housing, enrichment, farrowing accomodation, loose housing, stocking density, welfare assessment methods and others  DEFRA: AWO135 An investigation to assess the impact of flooring types on the welfare and health of pigs AWO137 A Review on Environmental Enrichment for Pigs ( AWO138 The effect of different weaning ages on the welfare of gilts and their piglets	AWO143 Re-designing the farrowing environment from first principles to optimise animal welfare and economic performance.  AWO509 Early environment effects on animal welfare, health and productivity (a cross-species project)



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