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Epidemiological study concerning the characteristics of organic pig farming in selected European countries



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A pdf can be downloaded free of charge from the project website at:
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CONTENTS

Summary

Literature reviews (see also report of WP1) revealed that there is limited information on the health and welfare of sows in organic production systems. Therefore, interviews and on-farm assessments were conducted in a total of 101 organic pig farms in different European countries. The objectives were to gain knowledge about the current farm and management conditions and the health status of organic pigs in Europe and to identify possible risk factors and constraints that could be considered when trying to improve animal health status.

The questionnaire comprised a total number of 215 questions, covering housing conditions, management routine and feeding regime as well as preventive, hygienic and therapeutic health measures and available data about the animal health status. Participating countries were: Austria, Denmark, France, Germany, Italy, and Sweden. 66 farms kept at least one age group of pigs outdoors while 35 farms kept their pigs exclusively indoors, for the most part with a concrete outside run. On average, 74.6 (± 106.6) sows were housed per farm.

Housing conditions on organic pig farms were characterised by a large heterogeneity within and between European countries. The variation was further increased by the fact that some organic farms were dealing simultaneously with different housing systems for pigs of the same life stage.

Concerning the portion of bought-in-feedstuffs in relation to the total feed consumed, 52 farms indicated that more than 50 % of the feed ration consisted of home-grown feed. 43 farmers declared that less than 50 % of the feed originated from the farm whereas only 6 farms produced 100 % of their feed themselves.

In general, knowledge of the farm manager about the quality of feed ingredients used and the composition of the diets were low. Only few farmers made use of multiple phase-feeding in the different life stages of the pigs. There is reason to suspect that the feeding regimes were suboptimal on the majority of organic pig farms, leaving ample room for easily feasible improvements.

Genotypes used on the maternal and paternal side differed widely between countries. Artificial insemination was carried out on 53.9 ± 38.0 % of the investigated farms. 20 farms favoured natural service while 6 % of the farms used artificial insemination only.

With respect to the health management, some farms made comprehensive use of the various options such as quarantine, vaccination or parasite and rodent control, wheras many farmers neglected the implementation of preventive measures, including appropriate hygiene and disinfection measures. On the majority of organic farms with indoor housing, the options for disinfection were hindered by the fact that many farms were not able to implement an all-in all-out concept as they did not possess partitioned buildings which could have been cleaned and disinfected separately without the risk to contaminate pigs in the same building. 82 % of the farms received data on pathological findings of fatteners from the abattoir, whereas only 54 farms had abattoir data on sows available.

In correspondence with the large variation in the living conditions for pigs, also production data and mortality rates differed widely between organic pig farms. According to the estimation by the farmer concerning the occurrence of selected animal health problems, mortality of suckling piglets and weaners and weaning diarrhoea were named as the most relevant diseases problems.

Although dedicated to the same minimum standards, organic pig farming does not provide the same living conditions or a homogenous outcome of animal health parameters. Thus, organic standards do not automatically lead to a high status of animal health but, like all systems, also depends on the quality of management. Differences in management practices, restrictions in the availability of resources (labour time, financial budget etc.), and a lack of feedback and control mechanism within the farm system appears to be a main reason for the substantial variation between farms.

Introduction

Organic pig production, is gaining an increasing interest in Europe. More and more consumers are willing to pay premium prices for organically produced pork. Consumer's expectations regarding organic products of animal origin are not only focusing on food safety issues but address simultaneously the issue of animal health and welfare (Harper and Makatouni, 2002). For many people, organic pig farming appears to be a superior alternative to conventional pig production (Yiridoe et al., 2005; Hughner et al., 2007). Even though organic pig farming only covers a small percentage of the market, the expressed approval by the general public in most EU countries appears far greater than the market share.

However, information on the living conditions and the health status of pigs in organic farming throughout Europe is scarce. Previous studies on animal health and welfare in organic pig production in different countries in Europe underline the need for improved management tools to ensure high process and product quality (Dietze et al., 2007).

The objective of Work Package 2 "Epidemiological study in organic pig herds" was to obtain epidemiological data on the prevalence of diseases and parasite infections in the participating countries. Furthermore, data provided by this study were generated to be used as background information for the development of disease-specific HACCP systems in Work Package 3 and will additionally supply data for future research projects in this area.

Method

Interviews and on-farm assessments were conducted in a total of 101 organic pig farms in different European countries. Participating countries and number of farms were: Austria (n = 16), Denmark (n = 16), France (n = 20), Germany (n = 20), Italy (n = 16) and Sweden (n = 13). In each country, farms were selected specifically for the project with a minimum of 20 sows per farm as inclusion criterion where possible. Differences in the number of participating farms between countries were a result of the limited number of organic pig farms in some countries (e.g. Sweden), and the willingness of the farm managers to participate in the project.

The data were gathered over a time period of 12 months during 2008, including on-farm data acquisition, productivity data and treatment incidences deriving from records of the year 2007.

Within WP2, a questionnaire was developed in order to assess the living conditions and the farm management of organic pigs. The questionnaire comprised 215 questions, considering the different local conditions in the European countries. The questions covered general information, health status, cleaning and disinfection, preventive and therapeutic health measures, housing, management routine and feeding regime.

Medicine usage (including routine medication and medication intervals) was recorded as documented by the farmer and used to calculate the treatment incidence. Data recording was focussed on the following areas: piglet mortality, reproductive disorders, weaning diarrhoea and parasite infections. The questionnaires were completed by an observer during interviews with the farmer or manager. The observer also recorded data regarding animals, housing and management during the farm visit.

Results

Farm structure

The general structure of the organic pigs farms involved in the epidemiological study is presented in table 1.

Table 1. Structure of the farms involved in the epidemiological study

Country	Breeding to finishing	Breeding only
Austria (16)	6	10
Denmark (16)	16	0
France (20)	18	2
Germany (20)	17	3
Italy (16)	16	0
Sweden (13)	8	5
Total (101)	**81**	**20**

While 32.6% of the farms had converted to the organic production method more than 10 years previously, 31.8% were between 10 and 5 years and 35.6% had converted within the last 5 years. Independent of the time after conversion, 45 farms (43.3%) were familiar with pig production for more than 30 years, 34 farms (32.6%) had kept pigs for more than 10 years; 25 farms (24%) started with pig production in the past 10 years.

On 41 farms further species in economically relevant numbers were kept beside pigs. 19 farms kept beef cattle, 9 farms dairy cows, 6 farms kept laying hens and 12 farms turkeys. Sheep were housed on 8 farms and 9 further farms kept other farms animals (2 x horses, 2 x goats, 2 x rabbits, 1 x fur animals, 1 x honey bees). On average, 1.45 (± 0.98) manpower per year was dedicated to pig production. Farms cultivated 89.4 ha (± 83.6 ha) of agricultural area, ranging from 8 to 450 ha.

Numbers of outdoor and indoor housing systems investigated in the study are shown in table 2. Outdoor production was widely used, particularly in the Scandinavian countries, France and Italy. However, on some farms, pigs were kept in free range systems only during a specific production stage. 66 farms (65%) kept at least one age group outdoors and did this on average since 8.5 years, ranging between one and 30 years. Correspondingly, farmers possessed different experience with respect to outdoor systems of pigs. 35 of the investigated farms kept their pigs indoors, for the most part with a concrete outrun.

Table 2. Number of outdoor and indoor housing systems investigated in different countries

Country	Outdoor (min. 1 age group)	Indoor housing
Austria	1	15
Denmark	16	0
France	15	5
Germany	5	15
Italy	16	0
Sweden	13	0
Total	**66**	**35**

The climatic conditions in the different countries are illustrated by the ambient temperatures measured in the warmest and coldest month in table 3. The mean temperature in the coldest month during 2007 was on average 2°C (min. -10.3; max. 12.0). The average temperature in the warmest month of the region ranged between 15.3°C and 28.0°C, averaging to 19.0°C.

Table 3. Climatic conditions in the different countries represented by the minimum, maximum, and average temperature in the warmest and coldest month

	Warmest month				Coldest month			
Country	MV	Std.	Min	Max	MV	Std.	Min	Max
Austria	20.8	0.81	19.5	22.0	0.25	1.03	-0.5	2.5
Denmark	16.7	0.25	16.5	17.3	2.0	0.45	1.6	2.8
France	17.7	1.14	16.2	19.4	5.7	1.02	4.2	7.2
Germany	17.5	0.46	16.3	18.3	2.4	1.23	-1.0	3.6
Italy	25.0	2.00	20.0	28.0	2.9	3.33	-1.0	12.0
Sweden	16.5	0.70	15.3	17.3	-3.2	3.08	-10.3	1.1
Overall	19.0	3.10	15.3	28.0	2.0	3.20	-10.3	12.0

Min. = Minimum, Max = Maximum, MV = Mean value, Std. = Standard deviation

30% of the farms were located in regions with 500 to 700 mm of annual rainfall. 35 % received rainfall in the range between 701-900 mm and 20% between 901-1100 mm. A further 10 % had rainfall exceeding 1100 mm. Rainfall below 500 mm per year was registered on 3 farms.

Herd size

Herd size ranged between 10 and 680 sows (see table 4). On average 74.6 (± 106.6) sows were housed per farm (median 40 sows). Number of gilts was on average 19.2 gilts per farm (min. 0; max. 300; ± 36.3) (median = 9 gilts).

Table 4. Herd size on the investigated farms in the different countries

Country	Number of sows		Number of gilts	Number of boars
	Mean values	Min.- Max		
Austria (16)	42.7 (± 26.3)	10-106	0-50	0-2
Denmark (16)	162.2 (± 152.3)	20-575	0-300	0-10
France (20)	36.1 (± 15.6)	12-80	0-25	1-6
Germany (20)	103.6 (± 156.5)	18-680	0-110	1-26
Italy (16)	38.1 (± 65.0)	15-280	3-80	1-5
Sweden (13)	65.6 (± 56.0)	15-175	0-40	1-3

Housing conditions

Overall space allowance and space in the lying area for different age groups of pigs are presented in table 5. In the case that housing conditions on the farms were based on mixed housing types, figures on both systems were provided.

Table 5. Overall space allowance per pig (including the concrete outside run) and in the lying area on organic farms for different age groups (data across countries)

Gestating sows					
	MV + Std. (m²)	Min (m²)	Max (m²)	Median (m²)	N
Space allowance indoor	7.7 ± 5.9	2.3	48	6.6	61
Lying area indoor	3.4 ± 1.8	0.9	8	3	59
Space allowance outdoor	886 ± 1338	20	10000	625	61
Lying area outdoor	2.6 ± 3.0	0.4	20	2	43
Lactating sows including suckling piglets					
	MV + Std. (m²)	Min (m²)	Max (m²)	Median (m²)	N
Space allowance indoor	13.2 ± 7.5	4.6	53.62	12	50
Lying area indoor	5.7 ± 3.4	0.62	18.1	5.7	49
Space allowance outdoor	681 ± 672	12	4500	560	62
Lying area outdoor	5.1 ±1.6	0.75	10	5.5	48
Weaners					
	MV + Std. (m²)	Min (m²)	Max (m²)	Median (m²)	N
Space allowance indoor	1.8 ± 2.4	0.4	19.7	1.2	68
Lying area indoor	0.8 ± 1.9	0.08	14.4	0.6	58
Space allowance outdoor	134 ± 218	0.2	1000	70	43
Lying area outdoor	0.7 ± 0.7	0.1	4	0.5	37
Fatteners					
	MV + Std. (m²)	Min (m²)	Max (m²)	Median (m²)	N
Space allowance indoor	3.0± 1.3	1.3	7	2.5	60
Lying area indoor	1.4 ± 0.8	0.2	3.5	1.1	50
Space allowance outdoor	795 ± 1265	0.7	5000	250	29
Lying area outdoor	1.3 ± 1.0	0.3	4.3	1	26

MV = Mean value, Std. = Standard deviation, Min. = Minimum, Max = Maximum, N = Number of farms

In order to be able to perform normal behaviour to some degree in indoor systems, in addition to the available area, the structuring into functional areas such as feeding, resting, locomotion and excretory areas is essential. For gestating sows, 88 % of the farms provided clearly defined functional areas within the housing conditions. This was also the case for the lactating sows on 84 % and for weaned piglets on 89 % of the farms. On 91 % of the farms (n = 80), fattening pigs had access to separated functional areas.

Group suckling

Group suckling was performed on 53 farms (52.4 %). The percentage of farms with group suckling in different European countries is presented in table 6. 83% of the farms with group suckling were able to provide data concerning the group size, ranging from 2 to 13 sows per group (mean value 4.75 sows per group) (Median = 4 sows). The average age of the piglets when introduced into group suckling was 10.2 ± 6.8 days (Median = 14 days).

Table 6. Percentage of organic farms with group suckling in different European countries

Country	Number of farms with group suckling
Austria (n = 16)	9 (56 %)
Denmark (n = 16)	7 (44 %)
France (n = 20)	6 (30 %)
Germany (n = 20)	13 (65 %)
Italy (n = 16)	6 (38 %)
Sweden (n = 13)	12 (92 %)

On 10 farms group suckling was indoors without any outdoor runs, whereas 21 farms kept the sows indoors with access to an outdoor run and on 23 farms group suckling was outdoors
The housing conditions varied to a high degree between farms and across countries which shown in tables 7- 11.

Table 7. Distribution of housing systems for sows in gestation between European countries

	Housing systems for gestating sows				
Country	Indoors with concrete outdoor run	Indoors with soil outdoor run	Outdoor paddocks (with access to huts or stables)	Woodland (with access to huts or stables)	Indoors without outside run
Austria (n = 16)	15	0	0	1	0
Denmark (n = 16)	1	1	14	2	0
France (n = 20)	0	0	14	0	6
Germany (n = 20)	15	2	3	0	0
Italy (n = 16)	0	1	4	11	0
Sweden (n = 13)	0	0	13	0	0

In Sweden, farrowing sows are usually kept in an individual farrowing pen in the barn until 10 days after farrowing when the sow and piglets move into group housing systems. In the summer season it is usually huts on pasture and in the winter season it is group pens in the barn with a concrete outrun. In winter season the sows stay indoors during the whole suckling period.

Table 8. Distribution of housing systems for sows in lactation between European countries

	Housing systems for lactating sows				
Country	Concrete outdoor run (+ stable)	Soil outdoor run (+ stable)	Paddock (huts or stables)	Woodland (huts or stables)	Exclusively indoor
Austria (n = 16)	15	0	0	1	0
Denmark (n = 16)	0	0	16	0	0
France (n = 20)	0	0	14	0	6
Germany (n = 20)	4	0	3	0	13
Italy (n = 16)	0	1	6	9	0
Sweden (n = 13)	0	0	13	0	0

Table 9. Distribution of housing systems for weaned piglets between European countries

	Housing systems for weaners				
Country	Concrete outdoor run (+ stable)	Soil outdoor run (+ stable)	Paddock (huts or stables)	Woodland (huts or stables)	Exclusively indoor
Austria (n = 16)	15	0	0	1	0
Denmark (n = 16)	10	1	5	0	0
France (n = 20)	0	0	3	0	15
Germany (n = 20)	17	3	0	0	0
Italy (n = 16)	0	0	7	6	3
Sweden (n = 13)	0	0	13	0	0

No information: France = 3.

Table 10. Distribution of housing systems for fattening pigs between European countries

	Housing systems for fatteners					
Country	No fatteners	Concrete outdoor run (+ stable)	Soil outdoor run (+ stable)	Paddock (huts or stables)	Woodland (huts or stables)	Exclusively indoor
Austria (n = 16)	10	5	0	1	0	0
Denmark (n = 16)	2	12	1	1	0	0
France (n = 20)	2	1	1	0	0	16
Germany (n = 20)	3	11	1	3	0	2
Italy (n = 16)	0	1	0	4	11	0
Sweden (n = 13)	5	0	1	7	0	0

The heterogeneity of housing systems between and within European countries was further increased by the fact that some organic farms are dealing simultaneously with different housing systems for pigs of the same life stage. The number of farms with non-uniform housing types for the same life stage is presented in table 18.

Table 11. Number of farms with non-uniform housing types for pigs in each life stage

Country	Gestating sows	Lactating sows	Weaners	Fatteners
Austria (n = 16)	1	5	2	0
Denmark (n = 16)	8	1	4	5
France (n = 20)	9	1	5	1
Germany (n = 20)	4	1	3	1
Italy (n = 16)	0	1	0	1
Sweden (n = 13)	0	0	1	3

Except for 3 farms, all the farmers used straw for bedding. The other farmers stated that they used also sawdust, hay or woodchips for bedding. Cleanliness of the lying area was assessed by the interviewer during the farm visit using a scale from 1 = very clean to 5 = very dirty. The assessment represents only a snap-shot, however, providing estimation about the heterogeneity between farms. The results of the assessment for the different life stages are shown in the table 12.

Table 12. Cleanliness of the lying area for gestating and lactating sows and weaners on organic farms in different European countries

			Gestating sows		
Country	1 (very clean)	2	3	4	5 (very dirty)
Austria (n = 16)	4	9	3	0	0
Denmark (n = 16)	3	10	1	2	0
France (n = 20)	1	10	5	4	0
Germany (n = 20)	2	10	1	5	2
Italy (n = 16)	9	4	1	1	1
Sweden (n = 13)	3	6	3	1	0
			Lactating sows		
Austria (n = 16)	6	8	1	0	0
Denmark (n = 16)	7	7	2	0	0
France (n = 20)	1	14	5	0	0
Germany (n = 20)	1	15	3	1	0
Italy (n = 16)	9	4	0	2	1
Sweden (n = 13)	4	3	3	2	0
			Weaners		
Austria (n = 16)	9	5	2	0	0
Denmark (n = 16)	5	9	2	0	0
France (n = 18)	5	6	5	1	1
Germany (n = 20)	0	12	6	1	1
Italy (n = 16)	6	7	1	1	1
Sweden (n = 13)	1	4	2	6	0

Table 13. Cleanliness of the lying area for fattening pigs on organic farms in different European countries

			Fatteners		
Austria (n = 6)	3	2	1	0	0
Denmark (n = 16)	8	6	1	1	0
France (n = 18)	0	8	7	2	1
Germany (n = 17)	1	5	7	1	3
Italy (n = 16)	8	5	2	0	1
Sweden (n = 8)	0	1	3	4	0

From the total number of 384 observations (covering all age groups), only 12 observations were assessed as having very dirty lying areas whereas 96 observations were assessed as very clean lying areas. Overall 62.4 % of the farmers stated that their bedding material was usually of good quality. The variation of litter quality by farmers' perception in the different European countries is presented in table 14.

Table 14. Estimation about the quality of the litter by farmers' perception

	Litter quality		
Country	Bad	Half decent	Usually good
Austria (n = 16)	0	1	15
Denmark (n = 16)	0	11	5
France (n = 20)	5	8	7
Germany (n = 20)	1	5	14
Italy (n = 16)	2	4	10
Sweden (n = 13)	0	1	12

Outdoor systems

Pigs kept in outdoor systems are facing heterogeneous and changing environmental conditions with potential effects on animal health and welfare. The variation in soil type in outdoor systems for pigs in different European countries is shown in table 15.

Table 15. Soil type in outdoor systems for pigs in different European countries

	Soil type		
Country	Clay	Mix	Sandy
Austria (n = 1)	1	0	0
Denmark (n = 16)	2	9	5
France (n = 15)	3	10	2
Germany (n = 5)	0	1	4
Italy (n = 16)	7	7	2
Sweden (n = 13)	5	7	1

In Denmark there is a national permission for nose rings to be used in outdoor systems. 12 of 16 organic farms made use of this permission. In Germany nose rings are only allowed in

outdoor systems and with a special permission by certification bodies. The 3 organic farmers with outdoor systems made use of this derogation. In addition, nose rings were used in France on 8 organic farms with an outdoor housing system for lactating sows.
The time period pigs were kept on the same paddock ranged between 0.2 and 9 years. On average pigs remained on the same paddock for 1.5 (± 1.6) years. The time period before pigs returned to previously used paddocks ranged between 0 and 10 years. On average, outdoor areas were not used again by pigs before 2.2 (± 2.1) years had elapsed.
On 29 farms from the total of 58 farms with outdoor housing for sows in gestation and 62 of the total of 66 farms with outdoor housing for sows in lactation, areas were in permanent use. This was also the case for weaners on 9 of 30 farms with outdoor housing for weaners. 7 farms with outdoor fatteners (n = 27) stated that some land areas for fatteners were in permanent use.

Nutrition

A principle of organic farming is to primarily rely on home-grown feedstuffs. In the questionnaire, the farmers were asked for the origin of their food: 6 farms produced 100 % of their feed themselves whereas 52 farms indicated that more than 50 % of the feed ration consisted of home-grown feed. 43 farmers declared that less than 50 % of the feed originated from the farm.
On all farms, the main energy source in the feed ration was represented by barley, wheat and triticale. In addition maize was part of the diet on 50% of the farms while oats were used on 23 and rye on 10 farms. Peas were indicated on 59 farms as the main feedstuff for protein supply, followed by faba beans on 45 and lupines on 6 farms. 45 farms made use of soy bean concentrate in the form of soy bean meal or soybean cake. Further protein supplements used were potato protein on 34 farms, while 18 farms in the Scandinavian countries added fish meal to the diet (DK = 14, SE = 4).
During the farm visits, hygienic demands for feedstuff storage areas (dry, clean, no access for rodents and no other contamination) were assessed by the interviewer. All four criteria were fulfilled by only 29 farms. Access for rodents and other animals was clearly inhibited on 47 farms, while measures to avoid other contamination were implemented on 39 farms. Clean feedstuff storage devices were identified on 94 farms.
Concerning control of the nutrient supply, 46 of the farms did not make use of any feed analyses. On 64 farms some form of food analysis was carried out (see table 16).
90 % of farmers who arranged feed analyses did this once a year, mainly after harvesting.
Farmers were also asked for the basis for calculating their rations (based on values from the literature or values from recent feed analyses), which is presented in table 17. In total, 16 farms did not conduct any calculations of the feed ration whereas 40 farmers formulated the diets on the basis of values from the literature and 45 farmers on values from recent feed analyses.

Table 16. Implementation of feed analyses of single components or feed mixtures on organic pig farms in different European countries

Country	Analysis of single compounds	Analysis of feedmixtures	No feed analysis
Austria (n = 16)	1	1	14
Denmark (n = 16)	5	5	10
France (n = 20)	9	7	6
Germany (n = 20)	8	4	8
Italy (n = 16)	4	7	7
Sweden (n = 13)	11	2	1
Overall	38	26	46

Table 17. Formulation of the diets for pigs in the different European countries based either on values from the literature or from recent feed analyses

Country	Feed calculations		
	No calculations	Based on values from literature	Based on values from recent feed analyses
Austria (n = 16)	1	14	1
Denmark (n = 16)	2	3	11
France (n = 20)	3	7	10
Germany (n = 20)	4	10	6
Italy (n = 16)	5	5	6
Sweden (n = 13)	1	1	11

Numbers of farms carrying out analysis of straw or food for mycotoxins in the different European countries are presented in table 18. 64 farmers did not analyse feed or straw for the presence of mycotoxins, 36 farmers sent feed samples to the lab for the analyses of mycotoxins and 3 farmers arranged analyses of straw used as litter.

On 70 farms (69%), no records about feed intake were available. 29 farmers assessed the feed intake of lactating sows on their farms. In 21 farms, records about feed intake were available for piglets and on 23 farms for fatteners. The number of different diets offered on each farm to the different age groups is presented in table 19.

Table 18. Numbers of farms arranging analyses of feed and straw with respect to mycotoxins in different European countries

Country	No	In feed	In straw
Austria (n = 16)	9	7	0
Denmark (n = 16)	15	1	0
France (n = 20)	15	5	0
Germany (n = 20)	6	14	1
Italy (n = 16)	8	8	0
Sweden (n = 13)	11	1	2

Table 19. Total number of different diets fed to the different age groups of pigs on the farms

Country	Number of diets fed on the farm							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Austria (n = 16)	0	1	6	6	2	1	0	0
Denmark (n = 16)	0	1	5	4	5	1	0	0
France (n = 20)	0	6	8	4	1	1	0	0
Germany (n = 20)	0	2	4	2	5	5	1	1
Italy (n = 16)	6	6	0	2	1	0	1	0
Sweden (n = 13)	0	6	5	0	2	0	0	0

In Italy, 6 farms made use of only one diet for all age groups. 22 farms offered only two different diets to the different age groups. Multi-phase feeding strategies with 6 and more different diets were implemented on 11 farms. A majority of the 28 farms based their feeding regime on 3 different diets. A distinction between diets for sows in lactation and those in gestation was made by 48.5 % of the farms while the other farms provided the same diet to sows with clearly different nutrient requirements. 30.7 % of the farms even fed the sows in gestation, the sows in lactation and the suckling piglets with the same diet. 26 % of the farms with all age groups (sows, weaners and fatteners) fed all the pigs with two different diets. 5 farms of a total number of 81 farms with fattening pigs fed three different diets during the fattening period (early-, mid- and late fattening period). A separate and special diet for the weaners was fed on 50 % of the farms while 26.7 % of the farmers offered a special diet for the suckling piglets. Body condition scoring (BCS) was used on 55% of the farms to adjust the feeding regime.

Feeding systems

Pregnant sows

To estimate the options on the organic farms to apply the diet under hygienic conditions and to assess the feeding regime, the farmers were asked about the feeding technique used on the farms and about the rationing of the feed in the different life stages (multiple answers were possible). In indoor housing systems, 38 farms provided the feed for sows in gestation in a feeding device while 5 farms practiced floor feeding. In outdoor systems 24 farms offered the diet for sows in gestation on the floor whereas 37 farms use feeding troughs.

On 3 farms, sows in gestation were fed ad libitum, whereas the other farms supplied the diet restrictively. 2 farms used liquid feeding, 17 farms fed mash feed and 82 farms dry feed.

The number of pregnant sows per feeding place ranged between 0.9 and 3.0 sows, the mean value accounted 1.1 (± 0.4) sows per feeding place. Two farms used some kind of computer-controlled feeding-on-demand system.

Lactating sows

In the case of sows in lactation, 4 farms with indoor housing for sows in lactation practiced floor feeding whereas 38 farms provided the feed in a trough.

In outdoor systems 21 farms practiced floor feeding whereas 42 provided the feed in a feeding device. On 35 farms with indoor housing, lactating sows were fed to appetite and on 4 farms,

they were fed ad libitum. On 44 farms with outdoor housing, sows were fed to appetite and on 20 farms, they were fed ad libitum. 3 farms used liquid feed for sows in lactation and 20 farms used mash feed. On 83 farms, sows were fed dry feed.
The number of sows in lactation per feeding place ranged between 0.1 and 4 sows. The mean value was 1.1 (± 0.5) sows per feeding place.

Suckling piglets

52.5 % of the farms with indoor housing systems for lactating sows had a separate creep area for piglets available (AT = 14, DK = 0, FR = 8, DE = 14, I = 5, SE = 12). 31 farms provided creep areas of adequate size, an external heat source and protection from wind.
29 of 53 farms with group suckling offered creep areas for piglets, of which most (24 farms) were large enough and 19 farms additionally offered an external heat source. Piglet nests with an external heat source protected from wind and also big enough were provided on 15 farms.
The time period when the farms started to provide creep feed for the piglets ranged between 1 and 49 days. The mean value was 14.8 (± 10.4) days. 27 farms gave no information or they didn't provide creep feed at all.
Suckling piglets in indoor housing systems were fed on the floor on 13 farms, whereas 30 farms used a feeding device to offer the diet to their piglets. On 16 farms, piglets were fed restrictively whereas on 21 farms, they were fed ad libitum.
In outdoor systems 28 farms provided a feeding device for the suckling piglets, compared to 8 farms without any feeding device for piglets. 17 farmers stated to feed the piglets restrictively, and 25 farmers fed them ad libitum. In total, 21 farms provided no separate feed to the suckling piglets.

Weaning regime

Concerning the weaning regime, piglets stayed in the suckling area at weaning for at least 48 hours on 46 from 98 farms (47 %). The piglets were mixed at weaning on 45 farms. An additional heat-source was applied on 11 farms. A restriction in the amount of the diet at time of weaning was practiced on 32 farms whereas the diet was changed in connection with the weaning on 31 farms. 15 farmers fed the weaned piglets restrictively and 54 farmers fed them ad libitum. The number of piglets per feeding place ranged between 0.9 and 13 animals, and averaged to 3.7 (± 2.5) weaners while the median was 3.
Concerning a possible adjustment of feed supplied during the weaning period, 45 farms (45%) did not adapt the feeding regime in the period around weaning (AT = 7, DK = 6, FR = 10, DE = 8, I = 10, SE = 4). 9 farms supplemented the feed with Zinc (DK =8, FR = 1). In this context, it is important to note that supplementation of diets with zinc in organic farming is allowed in Denmark.
On 25 farms acids were added to the feed (AT = 7, DK = 2, FR = 2, DE = 9, I = 4, SE = 1). 11 farms added antibiotics to the feed (AT = 3, DK = 1, FR = 2, DE = 4, I = 0, SE = 1). 17 farmers made use of other health-promoting additives such as: microbial probiotics, enzymes, phyto-biotic additives (herbs, plant extracts), wheat or oat bran, whey or cod liver oil.

Weaned piglets

In the case of weaned piglets, 3 farms with indoor housing for weaned piglets practiced floor feeding whereas 64 farms provided a feeding device. In outdoor systems 7 farms practiced floor feeding whereas on 24 farms, feeding devices were used.

On 19 farms with outdoor housing, weaned piglets were fed restrictively and on 13, they were fed ad libitum. No farmer used liquid feed for weaned piglets, 5 farmers used mashed feed and on 93 farms, they were fed dry feed. Number of piglets per feeding place ranged between 0.9 and 13 animals, and averaged to 3.7 (± 2.5) weaners.

Finishing pigs

For almost all fattening pigs in indoor housing systems (n = 53), the diet was offered in a feeding device. On 23 farms with indoor housing, fattening pigs were fed restrictively whereas on 31 farms, they were fed ad libitum. Fattening pigs in outdoor systems were fed on the floor on 7 farms and on 19 farms they got their diet in a feeding device. Fattening pigs in outdoor housing systems were fed restrictively on 19 farms, on 9 farms, they were fed ad libitum. 69 out of 81 farmers used dry feed for their fattening pigs, 8 farmers used mashed feed and another 3 used liquid feed.

The number of fattening pigs per feeding place ranged between 0.9 and 11 pigs. The mean value accounted 3.0 (± 2.6) fatteners per feeding place (Median = 2). In several farms they had some kind of wet feeder with recommended animals per feeding place between 15 and 50 according to type of the feeder.

Provision of roughage

According to the EU Regulation for organic agriculture, roughage has to be part of the daily feed ration for pigs. To gain an overview about the practice of roughage feeding, the farmers were asked about what kind of roughage was fed to which group of pigs and whether it was offered in a separate feeder or on the floor.

On 41 farms, roughage for sows was provided in form of hay and silage (amongst others clover grass silage, maize silage or whole crop barley silage). On 28 farms, fresh grass was offered as roughage. 10 farmers stated that they used only straw as roughage. However, in this context it was not clear whether straw was meant simultaneously as litter and roughage or whether the sows got additional straw as feed. 14 farmers provided no details concerning the use of roughage.

25 farmers did not feed any roughage to their weaned pigs or did not give any statement. On 30 farms, weaned pigs only get straw as roughage. 30 farmers provided different kinds of silage and 6 farmers stated that they amongst others used fresh grass as roughage.

One third of the farmers indicated to feed straw to the fattening pigs, compared to 50% who use different forms of silage (clover grass, whole crop grain, maize, grass silage), partly together with further roughage. 26 from 81 farmers keeping fattening pigs provided no details concerning the use of roughage or offered no roughage to the fatteners.

Water supply

Concerning water supply for the sows in gestation, 37 of the farms offered the water in troughs and 23 by way of nipple drinkers. Cup drinkers were installed on 25 farms; the other

16 farms had a mix of drinkers depending on indoor or outdoor sections or different housing sections indoors.
Water troughs as drinking facilities for sows in lactation existed on 35 farms. 26 farms offered water by means of a nipple drinker and 31 farms by means of a cup drinker. On 15 farms the suckling piglets were supplied with water by a water trough. 20 farms had nipple drinkers for the piglets and 22 farms offered the water through cup drinkers. On 33 farms, the piglets had no access to a specific water source (DK = 14, FR = 15, DE = 2, SE = 2). 8 farms had nipple drinkers in cups and on one farm the piglets had to drink from a pond and a well and on another farm out of a bucket.
In the case of weaned piglets, the watering system was characterised on 15 farms by water troughs and on 31 farms the water supply was given by nipple drinkers. Cup drinkers were available on 33 farms and round about 20 farms had nipple drinkers in cups. Most of the fattening pigs received the water by means of nipple drinkers (n = 32) and cup drinkers (n = 20). On 14 farms, water troughs were available and some farms had nipple drinkers combined with cups (n = 7).
In the case of sows in gestation, the number of animals per watering place ranged between 1 and 20 sows, averaged to 5.4 (± 5.3) sows. The median accounted to 3.5 sows per watering place. On average, 1.9 (± 2.4) lactating sows had access to a watering place, the number of sows ranged between 0.3 and 16 sows. From the investigated 99 farms with weaned piglets, the number of piglets per watering place ranged between 1 and 90. The mean value was 16.8 (± 15.6) weaners per water place and the median was 12. Out of 80 farms with fatteners, the number of animals per watering place ranged between 1 and 50 fatteners. The mean value was 10.7 (± 9.7) fatteners per water place and the median was 8.
On 50.5% of the farms, the water derived from the water well of the farm while the water of 45 % of the farms originated from public water supply. 5 % had other water sources such as a river etc.
54 of the farms didn’t make use of any water analysis whereas 20 farms made chemical analysis and 27 arranged bacteriological analysis. 87 farmers undertook no additional efforts to improve or ensure the quality of the drinking water. On 14 farms, chemical or alternative additives were used in connection with the water supply.

Breeding

Genotypes

Genotypes used on the maternal side differed widely between countries. In Austria, 10 farms had exclusively F1 crosses on the maternal side, additionally the following breeds were found in small numbers: Large White (9 farms), Duroc (5 farms), Landrace (8 farms) and Swabian Hall (2 farms). In Denmark, farms exclusively utilised crosses of Danish Duroc, Danish Yorkshire (Large White), Danish Landrace and Danish Hampshire as maternal breeds in various combinations. In France, all farms made use of the breed Large White in combination with Landrace, Duroc or Pietrain. One farm crossed Large White with a local breed (Gascon). 50 % of the German farms produced piglets with crossbred sows from German Landrace and German Large White. The other farms included either German Landrace or German Large White as maternal breeds. Furthermore, 3 farms utilised Danish breeds. On 3 farms, crosses

with Duroc lines were utilised. One farm kept the breed ‘Bunte Bentheimer‘. In Italy, the maternal lines were represented by a local breed (Cinta Senese) on 7 farms. In addition, crosses of Large White and Duroc (2 farms), Naima (Redone x Large White) (2 farms) and further Italian local breeds such as Mora Romagnola and Casertana were named. In Sweden crosses of Swedish Landrace and Yorkshire as breeding sows were used without exception.
In Austria, genetics used on the paternal side were dominated by the breed Pietrain (NN),) apart from two exceptions (2 farms used Duroc). In Denmark, farms resorted to Danish Duroc boars in the first place. In various farms also Danish Yorkshire (Large White), Danish Landrace and Danish Hampshire were utilised additionally. In France, farmers focused exclusively on Pietrain as the sire line, on one farm in connection with Duroc and/or Large White. Half of the German farms named Pietrain (partly in connection with Hampshire or Duroc) as the sire line. On the other 10 farms, only Hampshire x Duroc crosses were used. One farm utilized the breed ‘Bunte Bentheimer‘. In Italy 50% of the farms resorted to Cinta Senese as sire breed. On the other 8 farms, local breeds such as Mora Romagnola, Nero Dei Nebrodi, Casertana also Large White, Duroc and Hampshire were included. Apart from the breed Duroc, one farm named in addition wild boars. In Sweden, the breed Hampshire was declared as the sire line exclusively. 2 farms utilised also boars of the breed Duroc.
Three quarters of all investigated farms obtained their gilts from their own offspring (74 farms). 31 farms both purchased gilts and generated gilts from the own offspring, while 26 farms established their stock exclusively by acquisition. One farm in Austria and 2 farms in Italy sold gilts to other farms.
On 17 farms, the boars were recruited exclusively from their own offspring (AT = 1, DK = 7, FR = 2, DE = 3, I = 3, SE = 1). 11 farms both kept boars from their own offspring and purchased from other farms, 71 farms bought in all boars. Rotation of boars to other farms was done on 3 farms in Italy.

Insemination and farrowing management

Artificial insemination was carried out on 53.9 ± 38.0 % of the investigated farms. 20 farms (13 farms in Italy) favoured natural service while 6 % of the farms used artificial insemination without exception. 22 of the investigated farms did not test for pregnancy (13 farms in Italy). 25 farms tried to ensure pregnancy by keeping a boar with the sows. On 53 farms, an ultrasound technique was used for the assessment of pregnancy. On average sows were separated 8.5 ± 7.1 days before the calculated farrowing date, ranging from 0 to 60 days. 74 farms worked within a batch farrowing system, most of them using a three week cycle. Three farms (Austria) indicated the use of hormones. One farm made use of hormones to synchronise the gilts and two farms induced birth with hormones. Birth surveillance around the clock was ensured on 11 farms (Austria 6, France 2, and Germany 3), on another 11 farms during day time only. 47 farmers were casually present during farrowing and 32 farmers were not present at all during farrowing. 19 farms (12 in Italy) practiced no cross-fostering. The other 82 farms made use of cross-fostering on average up to day 2.8 ± 1.8 *post partum* (median=2), ranging from one up to 10 days *post partum*.

Marketing of organic pigs

On average, the piglets were sold to 3.8 ± 3.9 buyers, ranging from one to 20 buyers (median = 2) per farm. 44 of the investigated farms sold no piglets. Only 4 farms purchased piglets for fattening purposes. On breeding to finishing farms (n = 80), on average 705.9 pigs were fattened and slaughtered during 2007 (min. 5; max. 4500; median: 330.5) as shown in table 20. 50 % of the farms used electronic recording systems for productivity data. While 45 farm managers administered the records themselves, 6 farms delegated this task to external persons.

Table 20. Number of fattening pigs sold per annum by the involved breeding to finishing organic farms in different European countries

Country	Number of fattening pigs			
	MV + Std.	Min	Max	Median
Austria (6)	192.5 ± 188.4	5	450	135
Denmark (15)	1895.7 ± 1444.8	100	4250	2000
France (18)	404.9 ± 229.8	24	850	419.5
Germany (17)	422.8 ± 508.3	12	2000	200
Italy (16)	424.6 ± 1105.1	10	4500	95
Sweden (8)	701.8 ± 500.5	70	1457	677.5

MV = Mean value, Std. = Standard deviation, Min = Minimum, Max = Maximum

Health management

Vaccination regime

In total, 85 farms (84%) used at least one type of vaccination for sows. In 64 herds, sows were vaccinated against Parvo virus, and 60 farms against both Parvo virus and erysipelas. On 10 farms, vaccination was carried out against Porcine Reproductive and Respiratory Syndrome (PRRS). 6 farms vaccinated against more than 3 pathogen agents.

58 farms vaccinated their piglets at least against one disease, in most cases (30 farms) against Mycoplasma. Further vaccines used were: Circo virus (3), Porcine Intestinal Adenomatosis (PIA) (3), Lawsonia (5), Echerichia coli (1), Illeitis (1). 77 of the interviewed farmers vaccinated their boars at least against one pathogenic agent (57 farms Parvo virus, 58 farms erysipelas, 9 farms PRRS). In Italy, pigs were vaccinated on all farms (n = 16) and in all animal groups against the Aujetzky's disease.

Parasite control

36 farmers reported not to treat against endoparasites routinely (AT = 0, DK = 9, FR = 3, DE = 0, I = 13, SE = 11). On 60 % of the farms, sows were routinely dewormed, but it varied substantially between countries. While half of the farms dewormed at a fixed reproduction phase, the other half made use of deworming the whole herd once or twice a year. Half of all

interviewed farmers dewormed gilts and boars. On these farms, on average 30 % of the boars and 70 % of the gilts were dewormed once in a year while on the other farms the boars and the gilts were dewormed twice.
42 farmers dewormed their weaners (85.7 % once, 14.3% twice). Nearly one third of all farms with piglet rearing dewormed their total herd (excl. boar) as a matter of routine. 29 of 99 farmers dewormed also the boars routinely. 11 farmers indicated that they dewormed the fattening pigs once in the fattening period as a routine measure (2 farms dewormed twice).
When animals were not dewormed routinely farmers were asked for their reason to treat. 23 of the 41 farmers without routine treatment (56.1%) obtained advice from a veterinarian regarding parasite control. About one quarter of the farmers decided to deworm on the basis of results deriving from the analysis of faeces, 6 dewormed on the basis of the pathological findings at the abattoir while 13 farm managers were confident in their own judgement without making use of any analysis. 14 farms made no use of deworming measures at all.
26.7 % of the farmers treated the sows, 21.7 % gilts and boars, against ectoparasites. In the case of treatment, half of the sows were treated in relation to the reproduction cycle while the other farms treated their sows once or twice per year. Gilts and boars were treated once or twice per year. Nearly 10 % of the farmers treated the weaners once or twice per year and 3 % their fattening pigs once. 73.2 % of the farms stated that they made no use of treatments against ectoparasites routinely.
62 % of the farms which did not make use of routine treatments declared that the decision was made by the veterinarian or on the base of analyses from the laboratory (skin or blood samples). 36.5 % of the farm managers trusted their own judgement when making the decision about treatment. 20 % of the farms did not treat against ectoparasites at all.
The following anthelmintics were used on the farms:

- 44 times Benzimidazole (Fenbendazol, Flubendazole)
- 24 times Macrocyclic Lactones (Ivermectine, Doramectin)
- 28 times no anthelmintics were used
- 5 times not specified.

The applied anthelmintics were seldom changed. On average the same anthelmintics were used for more than 5.8 (± 4.9) years, varying between 0.2 and 20 years.

Preventive health measures

11 farms measured the temperature of all sows after birth (FR = 1, DE = 8, I = 1, SE = 1), while the other 90 farms did not. Only one farm additionally weighed the piglets after birth. Piglets were weighed after weaning on 14 farms (AT = 1, DK = 1, FR = 7, DE = 2, I = 2, SE = 1). 63% of the farms castrated male piglets within the first week *post natum*. 10.8% declared to castrate in the second week post natum, while 19.8% of the farms in general performed castration after the second week. Only 6 farms (FR = 1, I = 1, SE = 4) did not castrate the male piglets. 94.7 % of the farms which performed castration of piglets did so without anaesthesia, while 5.2 % farmers made use of anaesthesia during castration.
On 42.5 % of the farms no iron injections were used routinely, on 45.5 % of the farms the piglets received an iron application parenterally and on 7.9 %, iron was supplied orally. A combined supply (parenteral and oral) with iron was given on 3.9 % farms.

80 farms did not shorten the teeth of the piglets at any time. 15 farmers shortened the teeth causally and 6 farms implemented this measure as a matter of routine. In most cases, the shortening was carried out by grinding and in three cases by clipping.
On average the veterinarian visited each farm 9.5 (± 22.0) times per year, ranging from 1 to 110 visits per year (median = 2). The number of 110 visits per year was noted by three farmers in Germany. Whether this very high number is based on a real estimation or on subjective impressions of the farmers cannot be judged based on the replies to the questionnaire. 60 of 93 farmers (64.5 %) declared themselves to be satisfied with the visits of the veterinarians, 24.7 % were partially content and 9.6 % of the farmers were not.
On 69 farms, on average 4 (± 3.7) visits were made per year by the advisory service, ranging from 0.8 to 17 visits per year (median = 2.5). 31.7 % of the farms made no use of advisory service. 71 % of the farms which made use of the advisory service indicated themselves to be content with the service, 21.7 % were partially content and 5.8 % were not satisfied.
46 farms made use of quarantine in a separate building for all animals that were newly integrated into the herd for a period of 5 (± 2) weeks. The time interval, however, ranged from 1.5 to 12 weeks. On 18 farms (40%) at least one vaccination was implemented during the quarantine. 8 farms (17%) used the time of quarantine for deworming measures while 4 farms combined both measures within quarantine. 44 farmers failed to make use of quarantine measures.
Half of the farms in the study restricted the access of visitors to the herd (AT = 8, DK = 5, FR = 7, DE = 11, I = 14, SE = 5), while the other half of the farms did not. On 43.5 % of the farms, protective clothing was held ready for visitors (AT = 13, DK = 5, FR = 5, DE = 5, I = 6, SE = 10). In 9 cases, farmers declared to perform a strict differentiation between black and white areas (AT = 0, DK = 2, FR = 0, DE = 1, I = 6, SE = 0).
A control program against rodents existed in 57.5% of the farms, but 42.5 % had no control program. Details to the control programme used were provided by 51 farms, of which 38 farmers used poison/baits (AT = 2, DK = 5, FR = 4, DE = 13, I = 5, SE = 9) while 13 farmers made use of a professional pest controller (FR = 9, DE = 3, SE = 1). Contact with wild boars was possible on 36 of 100 farms. The possibility for predators to affect the stock was present on 68 farms.
68.3 % of the farm managers declared to kill pigs themselves in the case that these seemed not to be worthy of any therapy, 30 % of farmers did not kill any animals and on 3 farms the veterinarian was carrying out this task.
17 farmers indicated that they consulted the veterinarian in the case of any disease in the herd. 13 farmers consulted the veterinarian casually and nearly half of the farmers decided from case to case. 19 farmers called the veterinarian seldom while 2 mentioned to never have called the vet. 70 % of the farms stored more remedies than necessary for one week.
All farmers declared that they are in the possession of possibilities to separate and restrain the sows for treatment purposes. The options for separation of sick animals for pigs in different life stages are presented in table 21.

Table 21. Hospital pens for different age groups on organic pig farms

Hospital pens	Number of farms		
	Sows (n = 101)	Weaned piglets (n = 99)	Fattening pigs (n = 81)
None	12	33	17
In a separate pen	68	50	50
In a separate house	21	16	14

Hygiene management

Cleaning measures

28.7% of the investigated farms noted that they did not wash and disinfect the housing of pregnant sows (AT = 7, DK = 3, FR = 4, DE = 4, I = 11, SE = 0). Within a list of possible reasons for not implementing cleaning measures, the following reasons were given: lack of time (8), lack of space (17) and low temperatures in the winter time (17). 38 farms were not able to implement an all-in all-out concept as they did not posses partitioned buildings which could have been cleaned and disinfected separately without the risk to contaminate pigs in the same building with water and solvent. 14 farms noted that the outdoor area did not allow appropriate cleaning measures. Old buildings or an inappropriate quality of the surface were named by 8 farmers as obstacles. Further reasons were lack in the preparedness of the farm manager (4), missing tools (1), inappropriate access into the stable when using cleaning tools (2) and deep litter (1).

In the case of lactating sows, 47.5 % of the farms had production systems available which enabled an all-in-all-out concept. 12 farms (Austria 4, Germany 4, France 2, Sweden 1, and Denmark 1) noted that they washed the sows before moving them into the farrowing house. Weaners were kept in separate buildings on 40 % of the farms. 33 of 81 farms (40 %) kept their fattening pigs separately.

Disinfection measures

Independently from keeping the pigs indoor, outdoor or both indoor and outdoor, 40 % of the farms did not make use of any disinfection measures after cleaning. On 56 farms, disinfection with chemical agents was done, on 7 farms thermal disinfection. 52 farm managers gave details regarding disinfectant used: 32 farms used lime in different forms (burnt lime, lime milk, water-slaked lime), 9 farms used acids (formic acid, peracetic acid) and additionally some other agents were used by few farms: cresol (1), alkyldimetylbenzylammoniumchloride (2), sulfamine acid-potassiumpersulphate-sodium cloride-sodiumhexametaphosphate-mix (Virkon S) (3) hydrogen peroxide (2), iodine (1) and chlorine (1).

73 of 91 farms noted that they did not use any disinfectants for the pregnant sow housing. 9 farms used disinfection measures once and the same number of farms twice a year. 87 farms provided details of the disinfection management in the production area of the lactating sows, of which 56 % did not carry out any disinfection measures. 18.3 % made use of disinfectants up to 6 times a year and 26 % (23 farms) implemented the corresponding measures as a matter of routine more than 6 times in a year.

Monitoring of health and preventative measures

Data from abattoirs

On 54 farms (53.4 %) abattoir data on sows were available, while 31 farms provided details with respect to pathological findings, of which15 farmers had more than one indication. Named were among others: abscesses, pleurisies, arthritis and pathological findings in the liver. In the case of fattening pigs, 82 % of the farms investigated received data on pathological findings from the abattoir. 46 farms provided no further details concerning pathological findings without explaining why. In varying proportions, findings such as arthritis, pneumonia, abscesses and pathological findings in the liver were indicated. The latter ranged between 0 to 45 % of discarded livers. On average, 8.1 ± 12.3 % liver findings were reported to the farms.

Treatment records

In addition to the questionnaire, treatment data were gathered by the farmer during 6 months in 2008. Treatment records were available from 5 countries (AT, FR, DE, I, SE). 51 farmers provided details which were used in the following data descriptions. Data on the prevalence of different types of treatment may not be completely reliable as they depend on farmer reports rather than comprehensive medicines records. Treatments records in relation to the age groups and the involved European countries are presented in table 22.

According to the farmers' recordings, 25 % of all treated pigs (n = 16,264) were dewormed and 20 % were vaccinated. 50 % (n = 8,268) were treated with allopathic remedies while 3.2 % were treated with homeopathic remedies and 0.5 % received hormones. These data, however, provide no information concerning the morbidity rates in the herds in the specific time period, as they represent only treated sows and do not include healthy animals. Also no conclusions can be drawn about the existence of medicine records on those farms.

The proportion of treated sows in relation to the total number of sows within the data set averaged 10.4 % (n = 1,701). From these, 38.5 % were dewormed, 16.2 % (n = 276) sows were treated with allopathic remedies and 4.8 % of the sows were treated with hormones. 7.5 % (n = 126) of the sows were treated with antibiotics in connection with the occurrence of the mastitis, metritis and agalactia (MMA) complex.

Table 22. Number of organic pig farms, who participated in additional data recording for CorePIG for different age groups in different European countries

Country	Participating Farms	For sows	For suckling piglets	For weaned piglets
Austria	10	8	5	7
France	13	11	1	8
Germany	11	11	9	10
Italy	5	4	1	3
Sweden	12	6	5	3
Total	51	40	21	31

In the case of diseased sows, according to the replies of the farmers no antibiotics were used on 35 farms. 63 farms treated at least one sow with antibiotics. On 49 farms at least one sow was treated against mastitis/metritis by using antibiotics. The proportion of animals within the

herds treated against infectious diseases ranged between 1 and 90% of the sows. On average, 15 ± 16.2% of the sows on the investigated farms were treated with antibiotics. On two farms sows were treated with homeopathic remedies.

The proportion of treated suckling piglets in relation to the total data set amounted to 23.9 % (n = 3,882) while 64.1 % (n= 10,432) of the weaners were treated. 31.8 % of the treated weaners were dewormed, 27.6 % were treated with allopathic remedies against diarrhoea.

On the farm level, no suckling piglets were treated with antibiotics on 73 farms. 31 farms used antibiotic remedies in the case of diarrhoea (17 farms), arthritis (12 farms) and other diseases such as respiratory infections and runts (5 farms). On 4 farms piglets were treated additionally with homeopathic remedies.

On 42 farms, no weaners were treated with antibiotics in 2007. According to their own accounts 57 farms treated at least one weaner with antibiotic remedies, of which 46 farms treated against diarrhoea. Against respiratory infections and pneumonia up to 14 farms made use of antibiotic remedies. Homeopathic remedies were used on 3 farms.

84 of 104 investigated farms kept fatteners. On 65 farms (77%), no fattening pigs were treated with antibiotics in 2007. On 19 farms, at least on fattener was treated with antibiotics. The medication was directed among others against: respiratory infections, pneumonia, arthritis and diarrhoea. Homeopathic remedies were used on 4 farms.

In 653 of 1020 cases of treatment (64%), the decision to treat sick animals was made by the farmer himself. In 223 cases, the decision was taken by the veterinarian while in 10 cases the treatment was based on the decision of both. In 134 cases, no details were provided.

A complete traceability of single pigs treated with antibiotics was impossible on 17 farms. 38 farms noted that they were able to ensure the traceability of treated animals in the case of sows and piglets. No data were available in the case of weaners and fatteners.

Diseases and mortality

Production data and mortality

The situation on the organic pig farms concerning relevant production data and mortality, as reported in farm recordings are presented in table 23.

Table 23. Production data and mortality in organic pig farms in Europe

Parameter	MV+Std.	MIN	MAX	N
Live born piglets per litter	11.1 ± 2.2	6	15.5	94
Stillborn piglets per litter	1.3 ± 0.7	0	3.5	76
Weaned piglets per litter	8.6 ± 1.6	4	12.2	92
Age at weaning	47.9 ± 9.3	33	90	94
Raised piglets (25 kg) per litter	7.9 ± 1.6	4	12.2	65
Litters per sow and life	5.9 ± 2.1	1.9	13	81
Litters per sow and year	1.9 ± 0.2	1	2.5	88
Losses before weaning in % (Stillborn piglets excluded)	19.7 ± 9.7	0	50	83
Losses after weaning in % (up to 25 kg)	5.5 ± 5.4	0	26	82
Replacement rate (%)	31.7± 12.7	10	66	88

MV = Mean value, Std. = Standard deviation, Min. = Minimum, Max = Maximum, N = Number of farms

On the investigated farms, on average 34.8 ± 22.0 sows per farm died or were culled in 2007 (n = 93) (Min 0; Max 100).
Farmers were asked to estimate the type and amount of diseases on their farm (table 24).
91 % of the farmers indicated that the mortality rate of suckling piglets was highest in the first three days *post natum*, 9 farms increased the critical time period up to 6 days while 5 farms found mortality a problem also after the first week *post natum*.

Table 24. Estimation by the farmer concerning the occurrence of selected animal health problems and piglet mortality

	Often a problem	Sometimes a problem	Seldom a problem	No problem
Mortality of suckling piglets	38.6%	21.8%	27.7%	11.9%
Mortality of weaners	12.1%	21.2%	47.5%	19.2%
Weaning diarrhoea	18.2%	25.3%	39.4%	17.2%
Reproductive disorders around farrowing	4.0%	33.7%	48.5%	13.9%
Intestinal parasites	8.9%	15.8%	48.5%	26.7%
Ectoparasites	4.0%	14.9%	54.5%	26.7%

Farmers were also asked whether farm-related results from laboratories were available for specific health problems (table 25).

Table 25. Percentage of farms with laboratory based information for specific diseases frequently occurring on pig farms

	Laboratory based information available
Mortality of suckling piglets	19.8%
Mortality of weaners	36.4%
Weaning diarrhoea	41.1%
Reproductive disorders around the farrowing	9.9%
Intestinal parasites	26.7%
Ectoparasites	7.9%

To treat diseases appropriately, a profound diagnosis is an essential precondition for a high effectiveness in the cure of diseased animals. A summary of the type of advice for specific problems (mortality and health problems) which farmers seek is given is table 26.

Table 26. Number of farmers who consider external consultancy when facing specific health problems (multiple answers allowed)

Health problems	Diagnosis is formulated by		No diagnosis from external persons
	Adviser	Vet. surgeon	
Mortality rate of suckling piglets	13	22	66
Weaner diarrhoea	10	50	36
Animal losses during weaning	10	39	45
Reproduction problems	5	39	54
Gastro-intestinal parasites	13	45	43
Ectoparasites	7	35	59

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“COREPIG A tool to prevent diseases and parasites in organic pig herds”

Abstract

Interviews and on-farm assessments were conducted in a total of 101 organic pig farms in different European countries (Austria, Denmark, France, Germany, Italy, and Sweden) to gain knowledge about farm management and health status of organic pigs in Europe.

66 farms kept at least one age group outdoors while 35 farms kept their pigs exclusively indoors, for the most part with a concrete outside run. Housing and feeding conditions were characterised by a large heterogeneity within and between European countries. On many farms, the feeding regimes seemed suboptimal, leaving ample room for easily feasible improvements. With respect to the health management, some farms made comprehensive use of the various options, whereas many farmers neglected the implementation of preventive measures, including appropriate hygiene and disinfection measures. On the majority of organic farms with indoor housing, the options for disinfection were hindered by the fact that many farms were not able to implement an all-in all-out concept.

In correspondence with the large variation in the living conditions for pigs, also production data and mortality rates differed widely between organic pig farms. According to the estimation by the farmer concerning the occurrence of selected animal health problems, mortality of suckling piglets and weaners and weaning diarrhoea were named as the most relevant disease problems.

Although dedicated to the same minimum standards, it can be concluded that organic pig farming does not provide the same living conditions or a homogenous outcome of animal health parameters but, like all systems, also depends on the quality of management. Differences in management practices, housing conditions, restrictions in the availability of resources (labour time, financial budget etc.), and a lack of feedback and control mechanism within the farm system appears to be a main reason for the substantial variation between farms.

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