

**Report of the
Task Force on Zoonoses Data Collection
on the Analysis of the baseline survey on the
prevalence of *Salmonella* in slaughter pigs,
in the EU, 2006-2007¹**

**Part A: *Salmonella* prevalence estimates
Annexes**

(Question N° EFSA-Q-2006-042A)

**Adopted by
The Task Force on 30 May 2008**

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Annex I. Statistical methodology used in the analysis of the baseline survey on the prevalence of *Salmonella* in slaughter pigs, in the EU and Norway, 2006-2007.

I- Introduction

This survey follows from the regulation (EC) No. 2160/2003 on the control of *Salmonella* and other specified zoonotic agents, which provides the setting of Community targets for reducing the prevalence of *Salmonella* serovars with public health significance in animal populations. The European Union has carried out wide baseline surveys. The technical specifications of the baseline surveys are laid down in the Commission decisions: 2006/662/EC, 2006/668/EC, 2007/208/EC and 2007/219/EC. Reduction specific targets that are going to be considered are *slaughter pigs* and *turkeys*. In this report (Part A) the focus is on the baseline surveys on *Salmonella* in slaughter pigs.

II- Objectives

The objective of this report is to obtain valid estimates of the prevalence of *Salmonella* serovars in slaughter pigs, at the Community level and for each Member State, and separately for Norway.

‘Positivity for *Salmonella* spp.’, ‘positivity for *S. Typhimurium*’, ‘positivity for *S. Derby*’ and ‘positivity for *Salmonella* serovars other than *S. Typhimurium* and *S. Derby*’ as well as ‘seropositivity’ are the outcome variables to be analysed separately for slaughter pigs.

Statistical analyses include

- Descriptive analysis of the sample and the population.
- Prevalence estimation of the first three outcomes of interest for slaughter pigs in ileo-caecal lymph nodes (LN), in the European Union (EU) and in each Member State (MS), and Norway separately.
- Prevalence estimation of the first three outcomes of interest for slaughter pigs in carcass swabs (CS), in each of the 13 participating Member States (MS) and in the 13-MS group separately.
- Seroprevalence estimation for slaughter pigs in each of the 10 participating Member States separately.
- The correlation between the individual test results performed in different matrices (lymph nodes, carcass swabs and seropositivity) from the same slaughter pigs will be also evaluated
- The impact of the test misclassification bias of the two bacteriological tests in lymph nodes and carcass swabs on the prevalence estimates will be also investigated.

Information on the sampling scheme and testing procedures is provided in the technical specifications on the baseline survey in slaughter pigs, mentioned in the introduction.

III- Material and Methods

III-1 Data import and management

All data management and statistical analysis in this report were performed using SAS[®] System, whereas graphs were obtained using the open source software R (<http://cran.r-project.org>).

The data provided by EFSA contain information at the level of the samples within a slaughter pig. A variable “cTestType” was created which reflects whether the sample was obtained from a bacteriological analysis of the ileo-caecal lymph nodes (LN), from the bacteriological analysis of the carcass swabs (CS) or from the serological analysis of the meat juice or blood samples (MBS). Additionally, a variable ‘TestResult’ was created which equals 1 when the test for the presence of *Salmonella* spp. was positive, 0 when the test was negative and 2 when the MBS-test was inconclusive.

III-2 Methodology and tools for descriptive analysis

The descriptive analysis provides a comparison between the survey protocol and the sample in terms of sample size, stratification by month and by slaughterhouse, and by randomization. This is done using frequency tables.

In addition, the descriptive analysis presents a thorough description of the number and nature of the samples, overall and for every MS, by all independent variables. This descriptive analysis is based on histograms, frequency tables and simple chi-squared or trend tests. Note that at this point, the design of the study is not taken into account (i.e. no measures are taken to account for the survey design and the clustering). Therefore, these results should be interpreted only within the context of an exploratory analysis. Further analysis using appropriate modelling techniques should be used to validate these results in their proper context.

III-3 Methodology and tools for prevalence estimation

The hierarchical structure in the data can essentially be expressed as follows: slaughter pigs within a slaughterhouse, and slaughterhouse within a country. Interest goes to the pig-level prevalence. Therefore, let π_i be the probability for a pig to be positive, let n_{ij} be the number of pigs in slaughterhouse j from country i . The starting point for inference on the ‘pig-level prevalence’ of the different outcome variables is the binomial distribution for the number of positive pigs y_{ij} in slaughterhouse j from country i :

$$y_{ij} \sim \text{Bin}(n_{ij}, \pi_i). \quad (1)$$

In a fully random sample these numbers y_{ij} could be combined in a straightforward way to estimate the prevalence for country i . The main complications here were:

1. the assumptions on the binomial distribution were violated,
2. the sample was not drawn at random (but essentially stratified).

Indeed,

- *violation of independence*: outcomes from the same slaughterhouse was expected to be more alike (correlated) as compared to outcomes from a different slaughterhouse (hierarchical correlation structure),
- *violation of constant probability*: samples, even from the same slaughterhouse might have different probabilities to be infected (heterogeneity of probability).

Clustering

Given that the objective of the analysis was to obtain a prevalence estimate of *Salmonella* in the EU and for each MS and Norway separately, a *marginal or population-averaged approach* was followed. Indeed, the marginal model can be used to evaluate the overall prevalence (i.e. averaged over all slaughterhouses in the EU and in the MS and Norway separately). A logistic intercept model was fitted to provide an estimate for the prevalence of *Salmonella*, while correcting the estimated standard errors for clustering. The association structure is typically captured using a set of association parameters, such as correlations or odds ratios. Often, generalized estimating equations (GEE) (Zeger and Liang, 1986; and Liang and Zeger, 1986) are used to account for the clustering of outcomes. In this approach, instead of specifying the full distribution for the correlated binary response, we make assumptions about the mean, variance and correlation.

For example, let y_{ijk} represent the response of pig k of slaughterhouse j in country i . There are a variety of possible working correlation structures. Some of the more popular choices are:

- *Independence*: The simplest choice is the independence working model, i.e.,

$$\text{Corr}(Y_{ijk}, Y_{ij\ell}) = 0.$$
- *Exchangeable*: When there is no logical ordering for the observations within a cluster, an exchangeable correlation structure may be more appropriate:

$$\text{Corr}(Y_{ijk}, Y_{ij\ell}) = \alpha$$
- *Autoregressive*: When repeated samples are taken at the same slaughterhouse, an autoregressive correlation structure might be of interest, assuming that the correlation between samples depends on the time lag between samples:

$$\text{Corr}(Y_{ijk}, Y_{ij\ell}) = \alpha^{|t_k - t_\ell|}$$
- *Unstructured*: A totally unspecified correlation matrix is given by

$$\text{Corr}(Y_{ijk}, Y_{ij\ell}) = \alpha_{k\ell}$$

Any of these choices are justified since estimation using the GEE method is robust against misspecification of the working correlation structure. However, misspecification of the correlation structure can come at the cost of efficiency of the parameter estimates (Molenberghs and Verbeke, 2005).

As was mentioned before, in this report prevalence estimates for *Salmonella* in slaughter pigs, are obtained starting from (1), and considering the logit link function such that

$$\log\left(\frac{\pi_i}{1 - \pi_i}\right) = \beta_0. \quad (2)$$

In this model, e^{β_0} represents the odds of success. Using the GEE methodology, an estimate for β_0 together with a 95% confidence interval can be obtained. This interval is based on the robust or empirical standard errors from assuming an exchangeable working correlation structure, a plausible choice given that there is no logical ordering of pigs within a slaughterhouse. Independence was chosen only when problems occur while trying to fit the exchangeable structure.

From (2) now also follows the relation between π_i and β_0 , given by:

$$\pi_i = \frac{e^{\beta_0}}{1 + e^{\beta_0}},$$

which provides an estimate for the prevalence π_i , as well as a corresponding 95% confidence interval. The models were used only to obtain prevalence estimates. Since no model building is performed in this analysis, no model diagnostic or remedial measures are required to study the goodness-of-fit.

Weighting

Most statistical procedures analyze the data as if they were collected as a simple random sample. As a result, these procedures may lead to biased estimates and may underestimate the variability present in the data, when the data actually arise from complex surveys. Assigning weights to the observations is one possible approach to correct for the differences between the complex survey design and simple random sampling. In general, by using weights, one tries to ‘reconstruct the total population’, in order to avoid that certain strata or subpopulations are over- or under-represented.

The target population of the survey is defined as the population of slaughter pigs in the slaughterhouses representing 80% of the national throughput. For most countries with important pig sectors, the sampling rate is close to the target of 80%. However, some sampling rates were as low as 36%. Therefore, this disproportionate sampling was account for by means of weights.

Two weighting schemes were considered for the prevalence estimation:

- *No weights* (*‘unweighted prevalence’*): takes into account each observation *as it is*. This would disregard the disproportionate sampling at the level of the countries and within the slaughterhouses.
- *Slaughterhouse weights*: as represented in Table I.1

Table I.1. Proxy-slaughterhouse weights to account for the disproportionate sampling in the baseline survey on slaughter pigs.

Level	Weight
EU	
Country	WY1 = 80 % of national throughput / sum of throughput of sampled slaughterhouses
Slaughterhouse	WY2 = total # pigs (throughput) / # of pigs sampled (in a slaughterhouse)

Ideally, the country-level weight should be expressed in terms of the total and sampled number of slaughterhouses within a country. Since there is no information available on the number of non-sampled slaughterhouses, WY1 was used to reflect the disproportionate sampling.

The weights used when studying prevalence were therefore,

- on the level of the European Community:
 - $W_{EU} = WY1 * WY2$
- on the level of the MS and Norway:
 - $W_{MS} = WY2$

The weights WY1 is therefore not impact the country-specific prevalence estimates.

Finally, the sum of these weights gives an indication of the total number of slaughter pigs N in the EU, or within each Member State. To avoid overemphasizing the importance of the pigs used in the sample, it is therefore needed to standardize the calculated weights so that they sum to N_s , i.e., the sample size. In general, this implies that, for pig k , in slaughterhouse j , in country i :

$$\text{If } \sum_{ikc} w_{ijk} = N \text{ then } \sum_{ijk} (N_s/N) w_{ijk} = N_s.$$

Therefore, we will use the standardized weights: $w_{ijk}^* = (N_s/N) w_{ijk}$.

On the level of each member state separately, a similar standardization procedure can be applied. The following standardized weights $w_{jk}^* = (N_s^c/N^c) w_{jk}$ was used, where N_s^c (N^c) denotes the sample size (population size) within Country c .

Association between outcomes

When comparing proportions from matched samples, like two test results from the same pig, the correlation between these two proportions needs to be accounted for. In 2×2 tables a measure of agreement can be expressed in terms of the probability of agreement $\pi_{11} + \pi_{22}$ and the probability that is expected if the two test outcomes were independent, i.e., $(\pi_{1+}\pi_{+1}) + (\pi_{2+}\pi_{+2})$ by the single index called *Cohen's Kappa* (Cohen, 1960):

$$\kappa = \frac{(\pi_{11} + \pi_{22}) - (\sum_i \pi_{i+}\pi_{+i})}{1 - (\sum_i \pi_{i+}\pi_{+i})}$$

The index equals zero when there is no agreement. The stronger the agreement, the higher its value. Observe that when $\pi_{11} + \pi_{22}$ reaches its maximum possible value of 1, this results in $\kappa = 1$ or perfect agreement (Agresti, 2002).

III-4 Methodology for the investigation of the impact of test misclassification bias

Virtually all diagnostic tests are subject to test misclassification yielding biased estimates of the true prevalence when naively estimated as the mean of the serological data, \hat{y} . Correcting for this bias yields the Rogan-Gladen (Rogan and Gladen, 1978) estimator or

$$\pi = (\hat{y} + Sp - 1)/(Se + Sp - 1), \tag{3}$$

with Se and Sp being diagnostic test sensitivity and specificity. In this report a range of values for the sensitivity and specificity of the tests based on the analysis of lymph node samples, carcass swabs and meat juices and sera were considered to study their impact on the prevalence estimates.

Annex II. General features of the EU and Norway pig population and production, 2005¹

The following figures were based on 2005 Eurostat data (<http://epp.eurostat.ec.europa.eu>). Production data was derived slaughter figures originating in abattoirs. All EU MSs and Norway reported pig populations data in heads, while no data was available for pig production for Bulgaria and Romania. The maps presented in Figures 12 and 13 depict the proportion of the MSs pig population out of the EU total using a grey scale.

Pig Population

A total of 159,114,118 pigs were reported in the EU in 2005 with 74.5% of the animals censed in seven countries (Germany, Spain, Poland, France, Denmark, The Netherlands and Italy) (Table II.1). The largest pig population was in Germany (26,989,100) followed by Spain (24,888,900) Poland (18,711,300) and France (15,123,000). These four countries accounted for 53.9% of the total EU pig population.

Pig production (slaughter pig population)

A total of 238,948,792 pigs were slaughtered in the EU in 2005 (Table II. 2). The same top seven breeding countries mentioned in the above section accounted for 76.9% of the pig throughput. Equally, the same top breeding countries accounted for 56% of the total pig production. Germany reported the highest number (48,251,550) followed by Spain (37,616,148), France (25,681,259) and Poland (22,664,871)

¹ Source: Eurostat

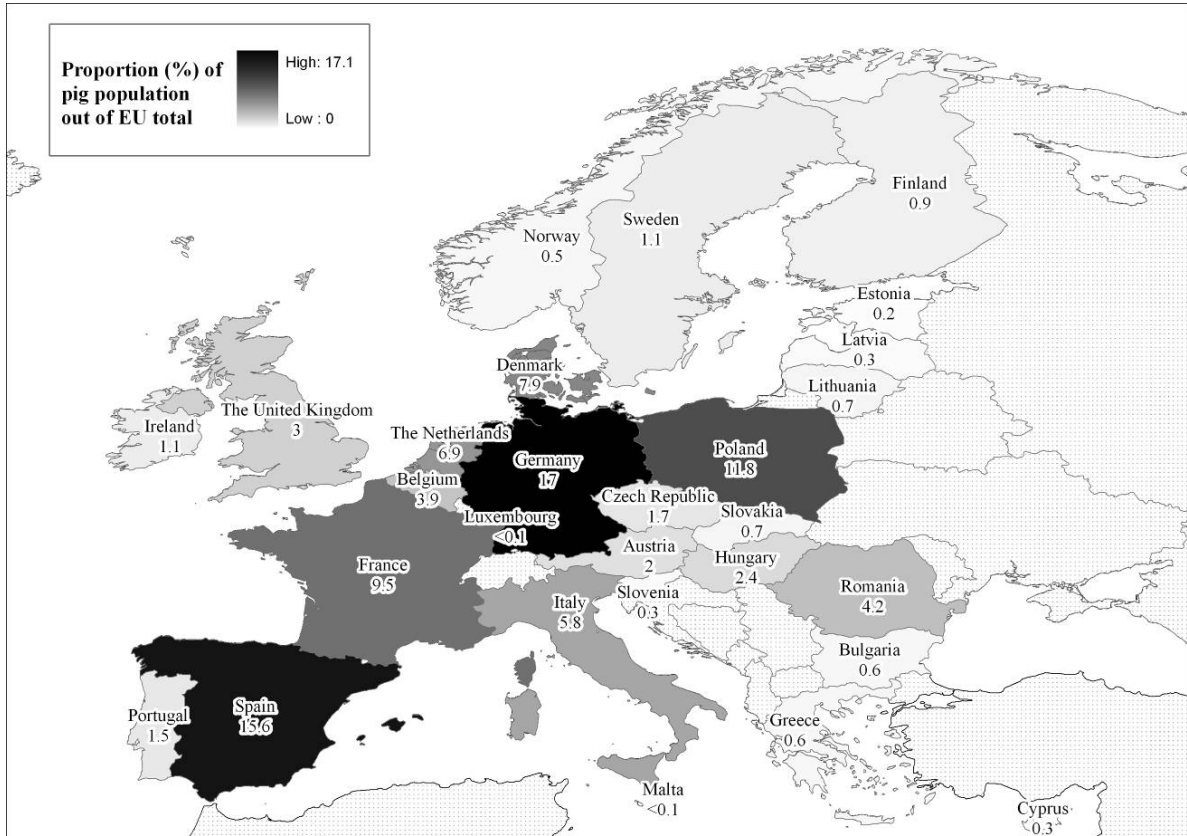
Table II.1. Distribution of pig population in the EU and Norway, 2005

	Pig population 2005^a (in Heads)
Austria	3,169,500
Belgium	6,253,000
Bulgaria	932,700
Cyprus	429,700
Czech Republic	2,719,000
Denmark	12,604,000
Estonia	351,600
Finland	1,440,000
France	15,123,000
Germany	26,989,100
Greece	952,100
Hungary	3,853,000
Ireland	1,678,000
Italy	9,200,000
Latvia	427,900
Lithuania	1,114,700
Luxembourg	77,100
Malta	73,000
Poland	18,711,300
Portugal	2,344,100
Romania	6,603,800
Slovakia	1,108,300
Slovenia	547,400
Spain	24,888,900
Sweden	1,797,400
The Netherlands	11,000,000
The United Kingdom	4,726,200
EU	159,114,800
Norway	802,800

^a Source: Eurostat and Norway

Figure II.1. displays the proportion (%) of the number of pigs present in each MS out of the EU total population using a grey scale code.

Figure II.1. Distribution of pig population in the EU and Norway, 2005^{1,2}



¹ Source: Eurostat and Norway

² For all Member States, the EU total population was used as the denominator.

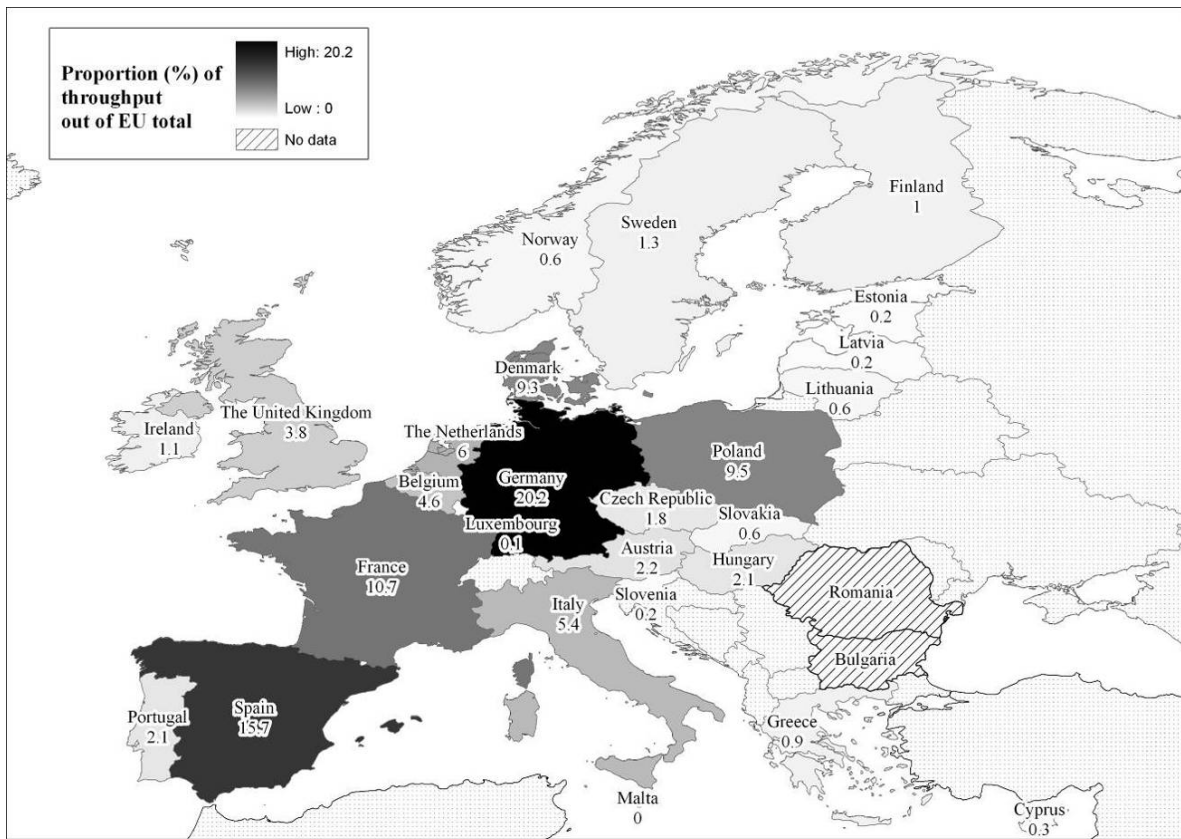
Table II. 2. Distribution of pig slaughter population in the EU and Norway, 2005

	Pig throughput 2005^a (in Heads)
Austria	5,324,184
Belgium	10,903,428
Bulgaria	-
Cyprus	672,747
Czech Republic	4,277,561
Germany	48,251,550
Denmark	22,109,189
Estonia	489,320
Greece	2,105,343
Spain	37,616,148
Finland	2,402,560
France	25,681,259
Hungary	4,919,567
Ireland	2,647,100
Italy	13,010,239
Lithuania	1,353,139
Luxembourg	157,843
Latvia	500,244
Malta	108,210
The Netherlands	14,376,802
Poland	22,664,871
Portugal	5,136,514
Romania	-
Sweden	3,159,930
Slovenia	391,788
Slovakia	1,516,234
The United Kingdom	9,173,022
EU	238,948,792
Norway	1,473,674

^a Source: Eurostat and Norway

Figure II.2. displays the proportion (%) of the MS-specific throughput (number of slaughtered pigs) out of the EU total slaughtered pig population (therefore, without Norway), using a grey scale code.

Figure II.2. Distribution of pig production in the EU¹ and Norway, 2005²



¹ Source: Eurostat and Norway

² For all Member States, the EU total population was used as the denominator.

Annex III. List of criteria used to identify non-valid and non-plausible information in the *Salmonella* slaughter pig database

The variables are uniquely identified using the 'item integer' mentioned in the *ad hoc* Data Dictionary.

Criterion	Rationale for the criterion
1	005 Capacity of the slaughterhouse: < 100 This criterion excludes all records of slaughterhouse with an annual capacity of less than 100 pigs.
2	012 Date of sampling: < 15 September 2006 This criterion excludes all records containing a date of sampling before 15 September 2006.
3	012 Date of sampling: > 15 October 2007 This criterion excludes all records containing a date of sampling after 15 October 2007.
4	014 Weight of the carcass at sampling: < 37.5 Kg This criterion excludes carcasses with a weight below 37.5 kg or a live weight of 50 kg (slaughter yield 75-80%).
5	014 Weight of the carcass at sampling: > 136 Kg This criterion excludes carcasses with a weight above 136 kg or a live weight of 170 kg (slaughter yield 75-80%).
6	024 Type of sample taken for bacteriology = 'ileo-caecal lymph node' and 024a Weight of the lymph nodes = '< 15 gram' This criterion excludes lymph nodes where the total weight of the lymph nodes is below 15 grams.
7	024 Type of sample taken for bacteriology = 'ileo-caecal lymph node' and 024b Number of the lymph nodes analysed < 5 This criterion excludes samples containing less than 5 lymph nodes.
8	026 Date of bacteriological detection testing: < 15 September 2006 This criterion excludes all records containing a date of primary testing in the laboratory before 15 September 2006.
9	026 Date of bacteriological detection testing: < value of 012 Date of sampling This criterion excludes all records containing a date of primary testing in the laboratory before the date of sampling.

-
- 10** **032 Reference of laboratory for serotyping: IS NULL (EMPTY) and 030 Test result is 'positive'**
This criterion excludes all records containing positive test results without information of the reference laboratory.
- 11** **032 Reference of laboratory for serotyping: IS NOT NULL (NOT EMPTY) and 030 Test result is 'negative'**
This criterion excludes all records containing negative test results with information of the reference laboratory.
- 12** **033 Isolate (Salmonella serovar): IS NULL (EMPTY) and 030 Test result is 'positive'**
This criterion excludes all records containing positive test results with no information of the isolate.
- 13** **033 Isolate (Salmonella serovar): IS NOT NULL (NOT EMPTY) and 030 Test result is 'negative'**
This criterion excludes all records containing negative test results with information of the isolate.
- 14** **Difference date between: '012 Date of sampling' and '026 Date of bacteriological detection testing': > 7**
- 14b** This criterion excludes all records containing a 'days to bacteriological start of test' above 7 days.

In a second step samples will be excluded having the same value in 011 Reference of the pig where at least one sample did not meet one of the aforementioned exclusion criteria with regard to the testing of the ileo-caecal lymph node.
-

Annex IV. Overview of the number of records with non-plausible characteristics in the final dataset, slaughter pig baseline survey in the EU and Norway, 2006-2007

	Criteria									Nb. of pig removed ^a	Nb. and type of samples removed
	C2	C3	C4	C5	C6	C7	C9	C14	C14b		
Belgium					46					13	32 lymph node samples ^b
Bulgaria							1			0	1 lymph node sample ^b
France				1			1			1	1 lymph node sample ^b
Germany								1		0	1 lymph node sample ^b
Greece	1		1	2	42	26	2	4	4	82	82 lymph node samples ^c
Hungary		1		1			2			4	4 lymph node samples ^c
Lithuania				3			1			3	1 lymph node sample + 1 carcass swab ^b
Luxembourg	3	14					2	11		30	30 lymph node samples ^c
Poland		1		1			1	6		6	1 lymph node sample + 2 carcass swabs ^b
Portugal								2		2	2 lymph node samples ^c
Slovenia					12					0	12 lymph node samples ^b
The Netherlands					5	17	1	2		0	24 lymph node samples ^b
Total	4	16	1	8	105	45	9	26	4	141	-

^a Values of this column are not the result of adding criteria C2 to C14b for each country because some pigs (or samples from the pigs) did not comply with more than one validation criteria. Whenever a pig was removed, the corresponding samples were removed.

^b Samples removed in addition to those deleted subsequently to the deletion of pigs.

^c These samples were corresponding to the pigs deleted.

Annex V. Overview of the number of slaughter pigs sampled, lymph node samples, carcass swabs and serological samples as well as number of sampled slaughterhouses, in EU and Norway, 2006-2007

	Number of slaughterhouses	Number of slaughter pigs	Number of samples		
			Lymph nodes	Carcass Swabs	Meat juices and sera
Austria	28	617	617	617	
Belgium	20	634	601	381	
Bulgaria	6	176	176		
Cyprus	3	359	359	359	359
Czech Republic	45	659	654	417	
Denmark	9	998	998	344	980
Estonia	8	420	420		
Finland	7	419	419		
France	21	1,164	1,163	413	1,158
Germany	78	2,568	2,567		
Greece	39	345	345		
Hungary	100	658	658		
Ireland	5	422	422	422	421
Italy	17	709	709		
Latvia	13	392	392	391	
Lithuania	11	462	461	461	462
Luxembourg	3	313	313		
Poland	400	1,177	1,176	447	
Portugal	36	658	658		
Slovakia	23	385	385		
Slovenia	7	443	431	441	439
Spain	19	2,619	2,619		
Sweden	8	402	394	402	401
The Netherlands	10	1,111	1,087		1,111
The United Kingdom	18	641	639	641	641
EU	934	18,751	18,663	5,736	5,972
Norway	9	408	408		

Annex VI. Results of the descriptive analysis of the sample data of the *Salmonella* baseline survey in slaughter pigs, in the EU and Norway, 2006-2007

The sampled data was compared with the protocol specifications. The total number of pigs and carcasses to be sampled in each of the slaughterhouses depends on the total sample size target for each country and the proportion of pigs processed in the slaughterhouse during the previous year. Additionally, the samples were to be randomly divided over all months and time of day.

Description of the sample

The distribution of the slaughterhouses by their individual lymph node sample size is represented in Table VI.1. Most slaughterhouses were sampled between 1 and 50 times. Few are sampled even more frequently, one slaughterhouse up to 341 times. Those data illustrates the disproportionate sampling and the clustering of the samples at the slaughterhouse level.

The randomization of the sampling over the months of the survey is illustrated for the lymph node samples in Table VI.2. and Figure VI.1., for the carcass swabs in Table VI.3. and Figure VI.2, and for the meat juice and sera samples in Table VI.4. and Figure VI.3. The sampling appears to be evenly spread over the year of survey by most participating countries, though no country has collected samples in October 2006. Latvia, Lithuania and Portugal started the sampling a few months later than the other countries. Hungary has obtained almost 40% of its sample during the last two months of the study.

The distribution of the number of lymph node, carcass swab, and meat juice and sera samples by the time of sampling during the working day is displayed in Figures VI.4., VI.5., and VI.6., respectively.

The distribution of the weight of the carcasses sampled according to the country is summarized in Figure VI.7. and Table VI.5. The sampled carcasses weigh between 40 and 136 kg. The average carcass in the European Union weighs 87kg.

The distribution of the weight of the lymph node samples is displayed in Table VI.6. Most lymph node samples weigh between 15 and 44 grams.

The distribution of the number of lymph node samples and carcass swabs by the number of days delay between the sampling date and the starting date of testing for *Salmonella* are presented in Tables VI.7. and VI.8., and in Figures VI.8. and VI.9., respectively. Most samples were analyzed between 0 to 2 days after sampling.

Proportions (%) of positive samples

Finally, the number and the raw proportions (%) of positive samples for each of the outcomes in lymph nodes and in carcass swabs are displayed in Table VI.9 and Table VI.10, respectively. The number and the raw proportions (%) of meat juices and blood samples with antibodies against *Salmonella* are given in Table VI.11.

Table VI.1. Distribution of the number of the slaughterhouses according to the number of lymph node samples collected at the slaughterhouse, in the EU and Norway, 2006-2007.

Country	Number of samples collected							Total
	< 50	50 - 99	100 - 149	150 - 199	200 - 249	250 - 299	≥ 300	
Austria	25	3						28
Belgium	17	3						20
Bulgaria	6							6
Cyprus		2			1			3
Czech Republic	45							45
Denmark	1	4	2	1	1			9
Estonia	6	1				1		8
Finland	5		1	1				7
France	12	8	1					21
Germany	62	11	3	1			1	78
Greece	39							39
Hungary	98	2						100
Ireland	2	1	1	1				5
Italy	11	5	1					17
Latvia	12	1						13
Lithuania	9	2						11
Luxembourg	1	1				1		3
Poland	400							400
Portugal	33	3						36
Slovakia	23							23
Slovenia	4	2		1				7
Spain	5	3	3	2	4	1	1	19
Sweden	6	1		1				8
The Netherlands		5	4		1			10
The United Kingdom	13	5						18
EU Total	835	63	16	8	9	1	2	934
Norway	6	3						9

Table VI.2. Number and percentage of slaughter pig lymph node samples collected by the month of sampling, in the EU and Norway, 2006-2007.

Country	Month of sampling													Total
	Oct. 06 1	Nov. 06 2	Dec. 06 3	Jan. 07 4	Feb. 07 5	Mar. 07 6	Apr. 07 7	May. 07 8	Jun. 07 9	Jul. 07 10	Aug. 07 11	Sep. 07 12	Oct. 07 13	
Austria	45 7.29%	55 8.91%	40 6.48%	59 9.56%	44 7.13%	60 9.72%	70 11.35%	54 8.75%	43 6.97%	57 9.24%	54 8.75%	36 5.83%		617 100%
Belgium		82 13.64%	63 10.48%	46 7.65%	51 8.49%	45 7.49%	50 8.32%	53 8.82%	56 9.32%	50 8.32%	55 9.15%	50 8.32%		601 100%
Bulgaria								33 18.75%	41 23.30%	38 21.59%	37 21.02%	27 15.34%		176 100%
Cyprus	7 1.95%	44 12.26%	28 7.80%	35 9.75%	35 9.75%	32 8.91%	31 8.64%	29 8.08%	29 8.08%	31 8.64%	36 10.03%	22 6.13%		359 100%
Czech Republic	56 8.56%	53 8.10%	54 8.26%	53 8.10%	54 8.26%	55 8.41%	54 8.26%	57 8.72%	55 8.41%	54 8.26%	55 8.41%	54 8.26%		654 100%
Denmark	76 7.62%	85 8.52%	85 8.52%	93 9.32%	89 8.92%	82 8.22%	70 7.01%	76 7.62%	81 8.12%	78 7.82%	81 8.12%	99 9.92%	3 0.30%	998 100%
Estonia	31 7.38%	38 9.05%	34 8.10%	35 8.33%	35 8.33%	34 8.10%	36 8.57%	35 8.33%	35 8.33%	35 8.33%	35 8.33%	37 8.81%		420 100%
Finland	30 7.16%	35 8.35%	35 8.35%	35 8.35%	35 8.35%	35 8.35%	30 7.16%	38 9.07%	38 9.07%	34 8.11%	35 8.35%	39 9.31%		419 100%
France		8 0.69%	84 7.22%	104 8.94%	132 11.35%	127 10.92%	116 9.97%	101 8.68%	112 9.63%	113 9.72%	117 10.06%	146 12.55%	3 0.26%	1163 100%
Germany	161 6.27%	225 8.77%	212 8.26%	223 8.69%	221 8.61%	223 8.69%	216 8.41%	218 8.49%	224 8.73%	213 8.30%	225 8.77%	206 8.02%		2567 100%
Greece	3 0.87%	24 6.96%	15 4.35%	40 11.59%	47 13.62%	18 5.22%	23 6.67%	34 9.86%	36 10.43%	28 8.12%	25 7.25%	47 13.62%	5 1.45%	345 100%
Hungary		74 11.25%	6 0.91%	85 12.92%	32 4.86%	69 10.49%	36 5.47%	5 0.76%	57 8.66%	17 2.58%	12 1.82%	247 37.54%	18 2.74%	658 100%
Ireland	35 8.29%	35 8.29%	33 7.82%	33 7.82%	33 7.82%	37 8.77%	38 9.00%	36 8.53%	35 8.29%	37 8.77%	34 8.06%	36 8.53%		422 100%
Italy		1 0.14%	3 0.42%	83 11.71%	103 14.53%	103 14.53%	78 11.00%	104 14.67%	57 8.04%	54 7.62%	49 6.91%	74 10.44%		709 100%

Table VI.2. *Continued*

Country	Month of sampling													Total
	Oct. 06 1	Nov. 06 2	Dec. 06 3	Jan. 07 4	Feb. 07 5	Mar. 07 6	Apr. 07 7	May. 07 8	Jun. 07 9	Jul. 07 10	Aug. 07 11	Sep. 07 12	Oct. 07 13	
Latvia					43 10.97%	65 16.58%	51 13.01%	46 11.73%	49 12.50%	55 14.03%	39 9.95%	44 11.22%		392 100%
Lithuania				51 11.06%	72 15.62%	46 9.98%	54 11.71%	55 11.93%	57 12.36%	42 9.11%	42 9.11%	42 9.11%		461 100%
Luxembourg	17 5.43%	29 9.27%	26 8.31%	24 7.67%	21 6.71%	27 8.63%	26 8.31%	25 7.99%	23 7.35%	23 7.35%	34 10.86%	33 10.54%	5 1.60%	313 100%
Poland	84 7.14%	96 8.16%	80 6.80%	120 10.20%	98 8.33%	101 8.59%	73 6.21%	89 7.57%	76 6.46%	134 11.39%	103 8.76%	122 10.37%		1176 100%
Portugal					76 11.55%	104 15.81%	81 12.31%	87 13.22%	75 11.40%	76 11.55%	78 11.85%	81 12.31%		658 100%
Slovakia	19 4.94%	40 10.39%	29 7.53%	36 9.35%	30 7.79%	34 8.83%	29 7.53%	36 9.35%	29 7.53%	41 10.65%	31 8.05%	31 8.05%		385 100%
Slovenia	31 7.19%	33 7.66%	33 7.66%	33 7.66%	38 8.82%	38 8.82%	37 8.58%	40 9.28%	37 8.58%	35 8.12%	37 8.58%	39 9.05%		431 100%
Spain		47 1.79%	417 15.92%	239 9.13%	220 8.40%	221 8.44%	214 8.17%	232 8.86%	230 8.78%	242 9.24%	242 9.24%	315 12.03%		2619 100%
Sweden	20 5.08%	29 7.36%	32 8.12%	32 8.12%	36 9.14%	31 7.87%	32 8.12%	34 8.63%	39 9.90%	40 10.15%	37 9.39%	32 8.12%		394 100%
The Netherlands	88 8.10%	88 8.10%	81 7.45%	92 8.46%	94 8.65%	92 8.46%	95 8.74%	87 8.00%	93 8.56%	85 7.82%	99 9.11%	93 8.56%		1087 100%
The United Kingdom	55 8.61%	53 8.29%	55 8.61%	53 8.29%	53 8.29%	51 7.98%	55 8.61%	52 8.14%	51 7.98%	54 8.45%	53 8.29%	54 8.45%		639 100%
EU Total	758 4.06%	1174 6.29%	1445 7.74%	1604 8.59%	1692 9.07%	1730 9.27%	1595 8.55%	1656 8.87%	1658 8.88%	1666 8.93%	1645 8.81%	2006 10.75%	34 0.18%	18663 100%
Norway	34 8.33%	36 8.82%	31 7.60%	36 8.82%	34 8.33%	34 8.33%	34 8.33%	34 8.33%	31 7.60%	33 8.09%	34 8.33%	37 9.07%		408 100%

Figure VI.1. Distribution of the number of slaughter pig lymph node samples collected by the month of sampling, in the EU and Norway, 2006-2007.

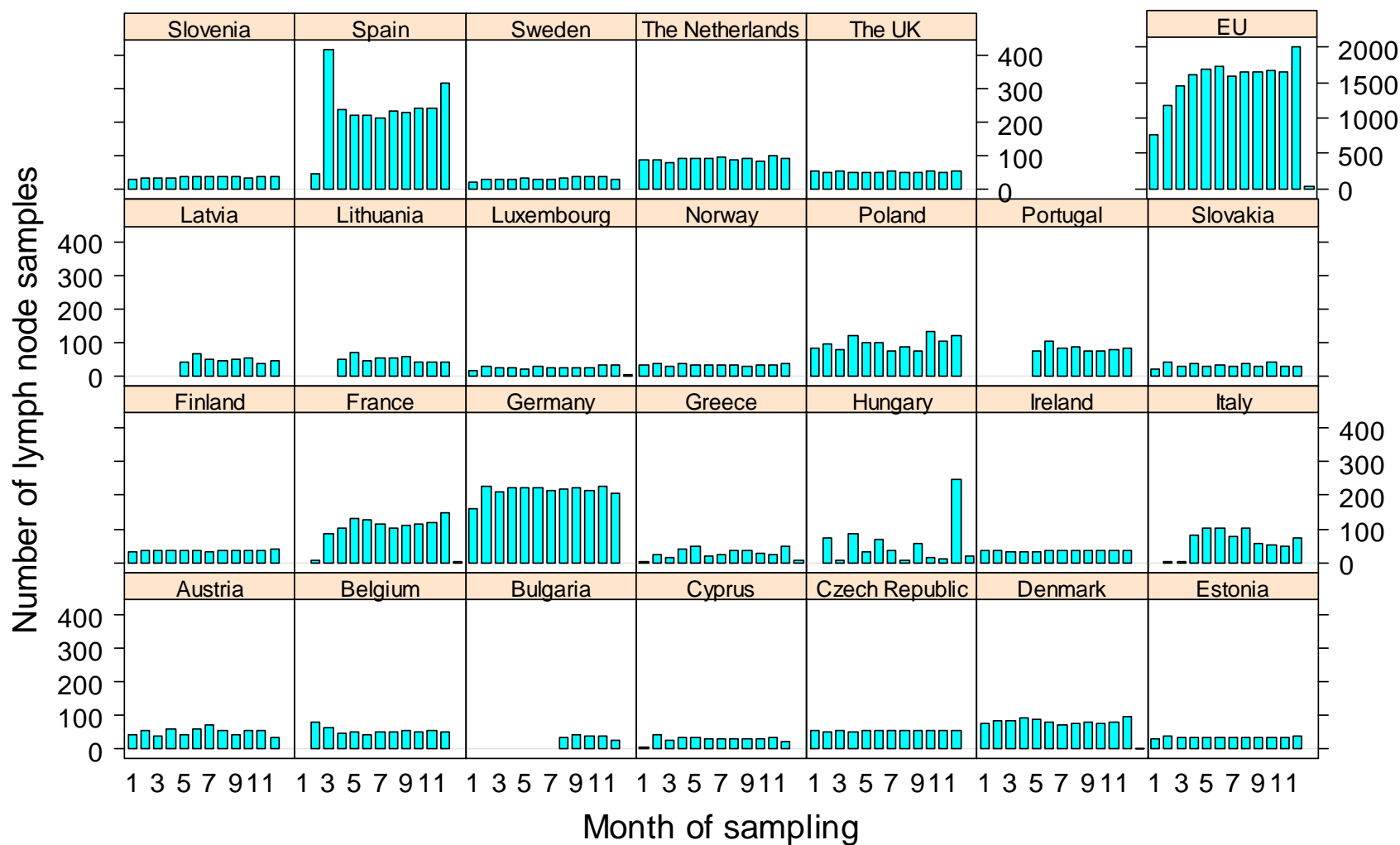


Table VI.3. Number and percentage of slaughter pig carcass swabs collected by the month of sampling, in the 13-MS group, 2006-2007.

Country	Month of sampling													Total
	Oct. 06 1	Nov. 06 2	Dec. 06 3	Jan. 07 4	Feb. 07 5	Mar. 07 6	Apr. 07 7	May 07 8	Jun. 07 9	Jul. 07 10	Aug. 07 11	Sep. 07 12	Oct. 07 13	
Austria	45 7.29%	55 8.91%	40 6.48%	59 9.56%	44 7.13%	60 9.72%	70 11.35%	54 8.75%	43 6.97%	57 9.24%	54 8.75%	36 5.83%		617 100%
Belgium		57 14.96%	36 9.45%	33 8.66%	32 8.40%	29 7.61%	31 8.14%	32 8.40%	34 8.92%	32 8.40%	32 8.40%	33 8.66%		381 100%
Cyprus	7 1.95%	44 12.26%	28 7.80%	35 9.75%	35 9.75%	32 8.91%	31 8.64%	29 8.08%	29 8.08%	31 8.64%	36 10.03%	22 6.13%		359 100%
Czech Republic	37 8.87%	37 8.87%	34 8.15%	28 6.71%	36 8.63%	36 8.63%	31 7.43%	32 7.67%	34 8.15%	35 8.39%	39 9.35%	38 9.11%		417 100%
Denmark	24 6.98%	28 8.14%	27 7.85%	27 7.85%	31 9.01%	27 7.85%	22 6.40%	23 6.69%	25 7.27%	23 6.69%	37 10.76%	47 13.66%	3 0.87%	344 100%
France		3 0.73%	25 6.05%	39 9.44%	47 11.38%	35 8.47%	38 9.20%	34 8.23%	51 12.35%	38 9.20%	39 9.44%	62 15.01%	2 0.48%	413 100%
Ireland	35 8.29%	35 8.29%	33 7.82%	33 7.82%	33 7.82%	37 8.77%	38 9.00%	36 8.53%	35 8.29%	37 8.77%	34 8.06%	36 8.53%		422 100%
Latvia					43 11.00%	65 16.62%	51 13.04%	46 11.76%	48 12.28%	55 14.07%	39 9.97%	44 11.25%		391 100%
Lithuania				51 11.06%	73 15.84%	46 9.98%	54 11.71%	55 11.93%	57 12.36%	42 9.11%	42 9.11%	41 8.89%		461 100%
Poland	27 6.04%	38 8.50%	26 5.82%	53 11.86%	34 7.61%	42 9.40%	25 5.59%	36 8.05%	33 7.38%	48 10.74%	35 7.83%	50 11.19%		447 100%
Slovenia	31 7.03%	34 7.71%	34 7.71%	37 8.39%	38 8.62%	39 8.84%	37 8.39%	41 9.30%	37 8.39%	37 8.39%	37 8.39%	39 8.84%		441 100%
Sweden	27 6.72%	30 7.46%	32 7.96%	32 7.96%	36 8.96%	31 7.71%	32 7.96%	34 8.46%	39 9.70%	40 9.95%	37 9.20%	32 7.96%		402 100%
The United Kingdom	55 8.58%	54 8.42%	55 8.58%	53 8.27%	54 8.42%	51 7.96%	55 8.58%	52 8.11%	51 7.96%	54 8.42%	53 8.27%	54 8.42%		641 100%
13-MS group Total	288 5.02%	415 7.24%	370 6.45%	480 8.37%	536 9.34%	530 9.24%	515 8.98%	504 8.79%	516 9.00%	529 9.22%	514 8.96%	534 9.31%	5 0.09%	5736 100%

Table VI.4. Number and percentage of slaughter pig meat juices and sera collected by the month of sampling, in the 9-MS group, 2006-2007.

Country	Month of sampling													Total
	Oct. 06 1	Nov. 06 2	Dec. 06 3	Jan. 07 4	Feb. 07 5	Mar. 07 6	Apr. 07 7	May 07 8	Jun. 07 9	Jul. 07 10	Aug. 07 11	Sep. 07 12	Oct. 07 13	
Cyprus	7 1.95%	44 12.26%	28 7.80%	35 9.75%	35 9.75%	32 8.91%	31 8.64%	29 8.08%	29 8.08%	31 8.64%	36 10.03%	22 6.13%		359 100%
Denmark	76 8%	84 9%	85 9%	91 9%	88 9%	81 8%	67 7%	76 8%	80 8%	76 8%	79 8%	94 10%	3 0%	980 100%
France		8 0.69%	83 7.17%	104 8.98%	132 11.40%	127 10.97%	116 10.02%	101 8.72%	111 9.59%	113 9.76%	114 9.84%	146 12.61%	3 0.26%	1158 100%
Ireland	35 8.31%	35 8.31%	33 7.84%	32 7.60%	33 7.84%	37 8.79%	38 9.03%	36 8.55%	35 8.31%	37 8.79%	34 8.08%	36 8.55%		421 100%
Lithuania				51 11.04%	73 15.80%	46 9.96%	54 11.69%	55 11.90%	57 12.34%	42 9.09%	42 9.09%	42 9.09%		462 100%
Slovenia	32 7.29%	34 7.74%	33 7.52%	34 7.74%	38 8.66%	40 9.11%	37 8.43%	41 9.34%	37 8.43%	37 8.43%	37 8.43%	39 8.88%		439 100%
Sweden	27 6.73%	30 7.48%	32 7.98%	32 7.98%	36 8.98%	31 7.73%	31 7.73%	34 8.48%	39 9.73%	40 9.98%	37 9.23%	32 7.98%		401 100%
The Netherlands	94 8.46%	96 8.64%	89 8.01%	93 8.37%	95 8.55%	92 8.28%	95 8.55%	87 7.83%	93 8.37%	85 7.65%	99 8.91%	93 8.37%		1111 100%
The United Kingdom	55 8.58%	54 8.42%	55 8.58%	53 8.27%	54 8.42%	51 7.96%	55 8.58%	52 8.11%	51 7.96%	54 8.42%	53 8.27%	54 8.42%		641 100%
9-MS group Total	488 5.71%	610 7.14%	650 7.61%	748 8.76%	805 9.43%	760 8.90%	740 8.67%	729 8.54%	756 8.85%	728 8.53%	756 8.85%	763 8.94%	6 0.07%	8539 100%

Figure VI.3. Distribution of the number of slaughter pig meat juices and sera collected by the month of sampling, in the 9-MS group, 2006-2007.

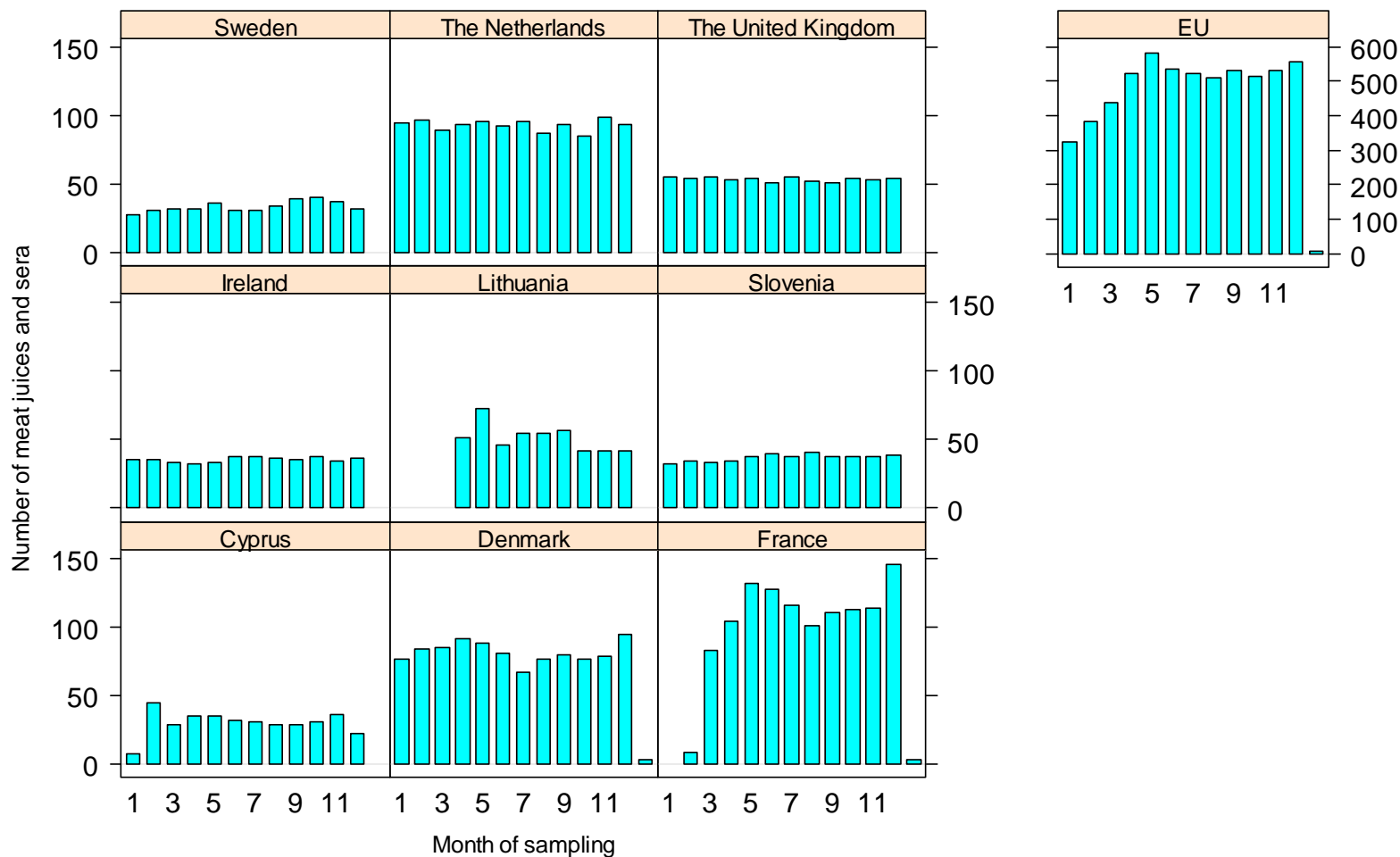


Figure VI.4. Distribution of the number of slaughter pig lymph node samples by the hour of sampling, in EU and Norway, 2006-2007.

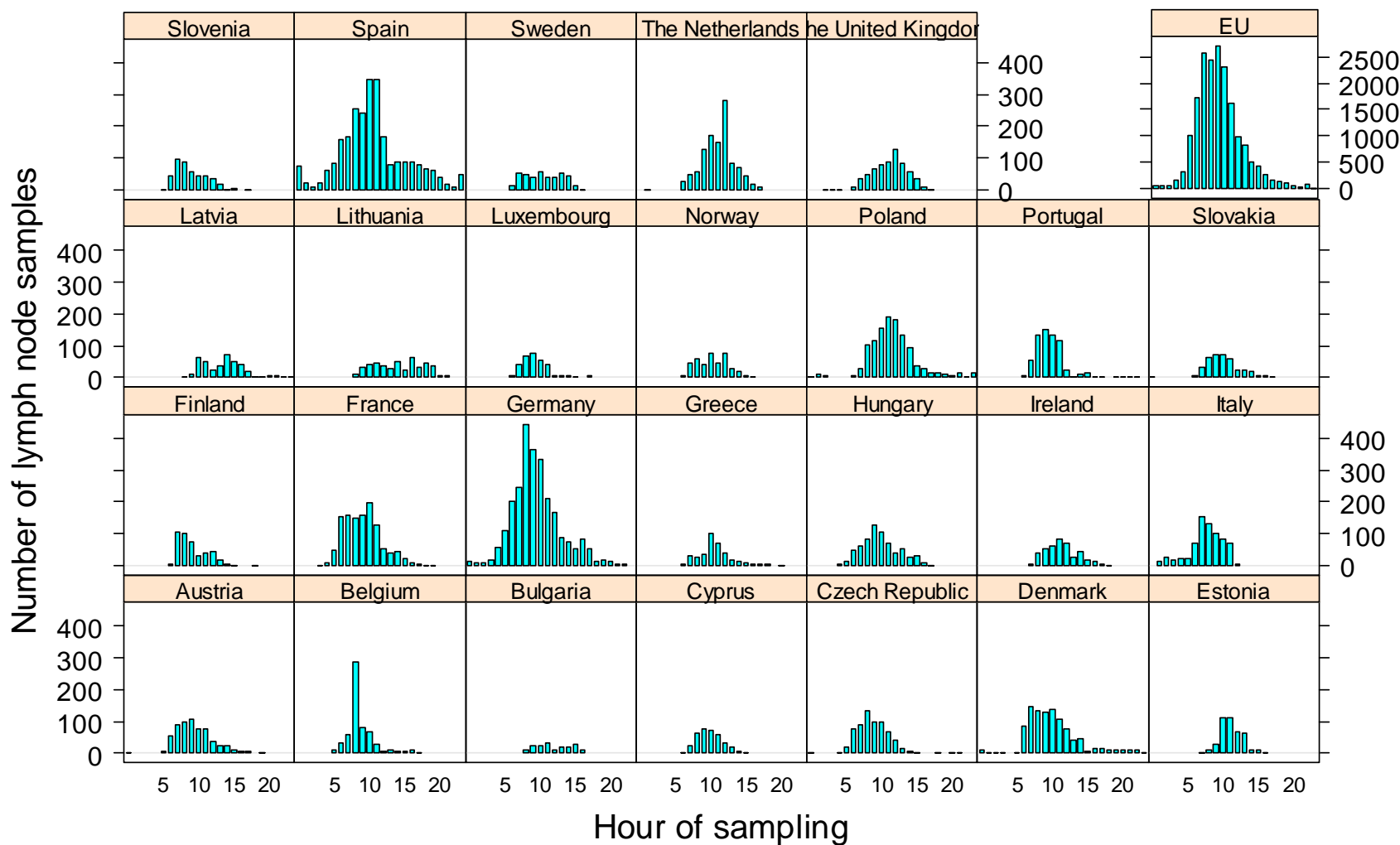


Figure VI.5. Distribution of the number of slaughter pig carcass swabs by the hour of sampling, in the 13-MS group, 2006-2007.

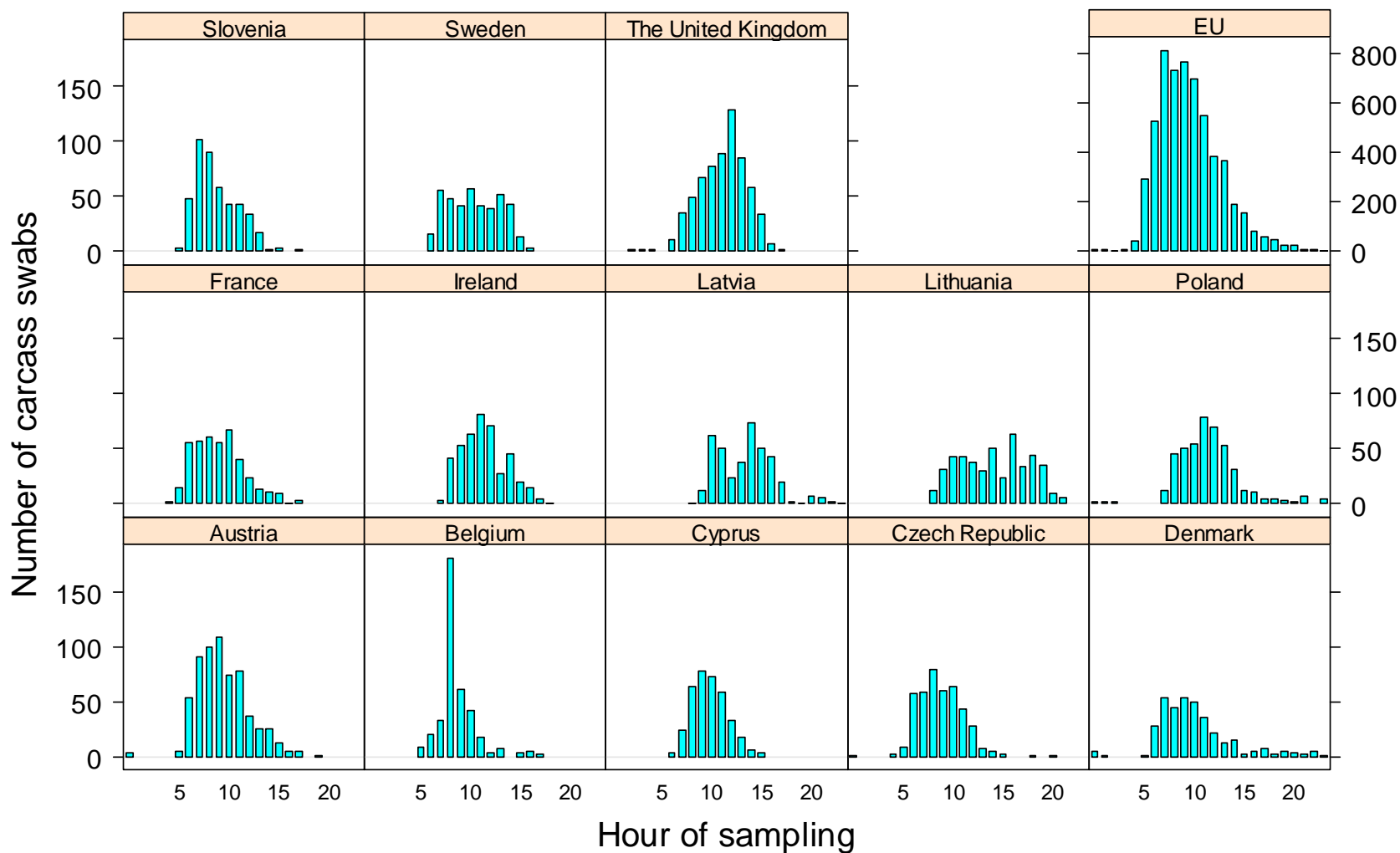


Figure VI.6. Distribution of the number of slaughter pig meat juices and sera sampled in slaughter pigs by the hour of sampling, in the 9-MS group, 2006-2007

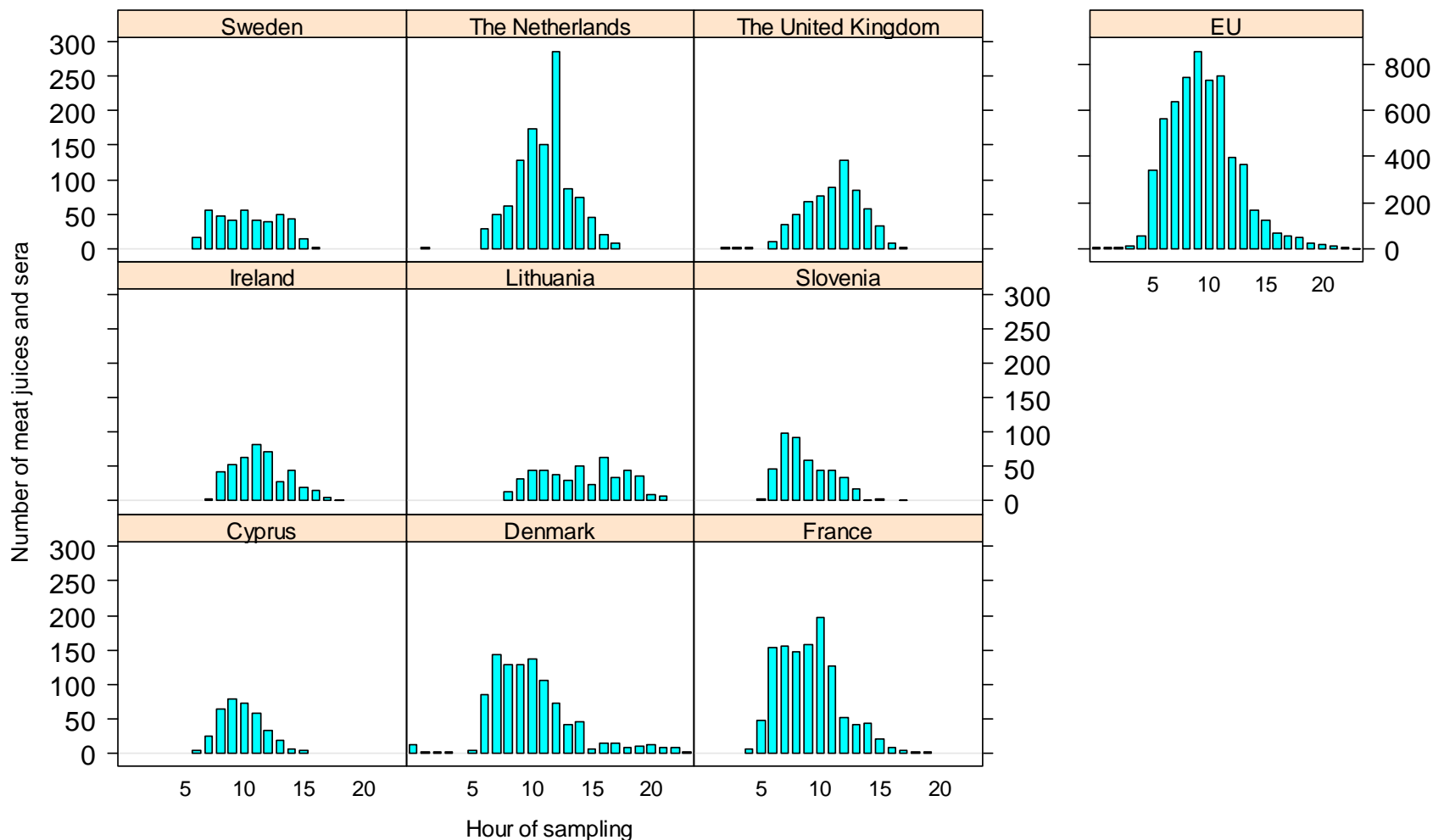
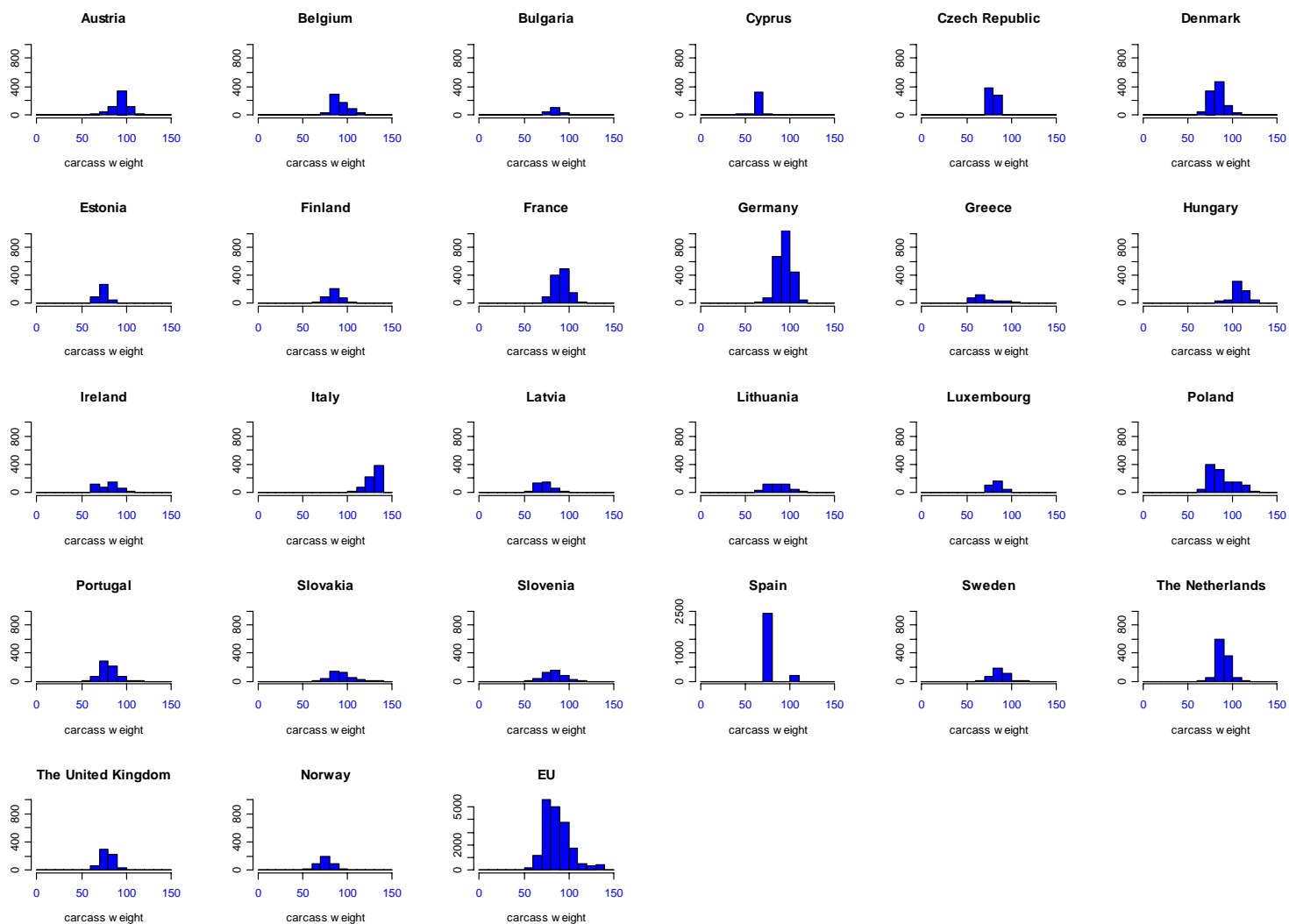


Figure VI.7. Distribution of the weight (in kg) of the slaughter pig carcasses sampled, in the EU and Norway, 2006-2007.



The Y-scale for Spain is different than those of the other countries.

Table VI.5. Distribution of the weight (in kg) of the slaughter pig carcasses sampled, in the EU and Norway, 2006-2007.

Country	Carcass weight			
	Min.	Median	Mean	Max.
Austria	60	95	94	121
Belgium	60	90	92	134
Bulgaria	68	85	84	99
Cyprus	42	70	66	84
Czech Republic	75	80	80	84
Denmark	55	83	83	122
Estonia	60	72	74	102
Finland	60	85	85	123
France	59	92	92	127
Germany	40	95	94	136
Greece	47	70	73	125
Hungary	45	110	110	136
Ireland	62	82	82	120
Italy	40	132	129	136
Latvia	51	72	74	120
Lithuania	53	87	87	125
Luxembourg	54	83	83	96
Poland	57	85	89	126
Portugal	57	80	80	115
Slovakia	58	91	93	133
Slovenia	54	82	83	121
Spain	71	71	74	110
Sweden	63	88	88	113
The Netherlands	64	89	90	128
The United Kingdom	54	79	79	128
EU	40	86	87	136
Norway	38	75	76	120

Table VI.6. Distribution of the number of samples by the weight of the slaughter pig lymph nodes, in the EU and Norway, 2006-2007.

Country	Lymph node weight								Total
	15-24 gms		25-34 gms		35-44 gms		≥ 45 gms		
	N	Percent	N	Percent	N	Percent	N	Percent	
Austria ^a	236	38%	231	38%	95	15%	52	8%	614
Belgium	137	23%	464	77%					601
Bulgaria	3	2%	155	88%	18	10%			176
Cyprus	249	69%	110	31%					359
Czech Republic	12	2%	303	46%	146	22%	193	30%	654
Denmark	204	20%	794	80%					998
Estonia	29	7%	121	29%	88	21%	182	43%	420
Finland	94	22%	185	44%	61	15%	79	19%	419
France ^b	-	-	-	-	-	-	-	-	-
Germany	1,235	48%	1,239	48%	42	2%	51	2%	2,567
Greece	74	21%	246	71%	21	6%	4	1%	345
Hungary	213	32%	205	31%	78	12%	162	25%	658
Ireland	72	17%	136	32%	118	28%	96	23%	422
Italy	374	53%	314	44%	15	2%	6	1%	709
Latvia	10	3%	382	97%					392
Lithuania	35	8%	236	51%	130	28%	60	13%	461
Luxembourg			313	100%					313
Poland	177	15%	963	82%	22	2%	14	1%	1,176
Portugal	655	100%	3	0%					658
Slovakia	119	31%	178	46%	59	15%	29	8%	385
Slovenia	194	45%	218	51%	16	4%	3	1%	431
Spain	1,841	70%	778	30%					2,619
Sweden	188	48%	200	51%	5	1%	1	0%	394
The Netherlands	169	16%	917	84%	1	0%		0%	1,087
The United Kingdom	-	-	-	-	-	-	-	-	-
EU Total	6,320	37%	8,691	52%	915	5%	932	6%	16,858
Norway	3	0%	229	56%	74	18%	102	25%	408

^a The weight was missing for 3 lymph node samples.

Table VI.7. Distribution of the number of slaughter pig lymph node samples by the number of days delay between the sampling date and the starting date of detection testing for *Salmonella*, in the EU and Norway, 2006-2007.

Country	Number of days delay between sampling date and starting date of detection testing for LN														Total		
	0		1		2		3		4		5		6			7	
	N	Percent	N	Percent	N	Percent	N	Percent	N	Percent	N	Percent	N	Percent		N	Percent
Austria	89	14%	342	55%	155	25%	23	4%	8	1%							617
Belgium	55	9%	187	31%	216	36%	80	13%	30	5%	19	3%	6	1%	8	1%	601
Bulgaria			105	60%	42	24%	27	15%	1	1%			1	1%			176
Cyprus	179	50%	103	29%	16	4%	38	11%	10	3%	7	2%			6	2%	359
Czech Republic	416	64%	204	31%	20	3%	9	1%	3	0%			2	0%			654
Denmark	4	0%	576	58%	197	20%	155	16%	54	5%	9	1%	2	0%	1	0%	998
Estonia	25	6%	380	90%	14	3%			1	0%							420
Finland	1	0%	241	58%	163	39%	10	2%	4	1%							419
France	18	2%	163	14%	469	40%	417	36%	91	8%	5	0%					1,163
Germany	480	19%	1,099	43%	485	19%	219	9%	164	6%	79	3%	33	1%	8	0%	2,567
Greece	87	25%	200	58%	42	12%	8	2%	2	1%					6	2%	345
Hungary	53	8%	400	61%	141	21%	45	7%	6	1%			5	1%	8	1%	658
Ireland	52	12%	256	61%	62	15%	12	3%	31	7%	6	1%	2	0%	1	0%	422
Italy	305	43%	327	46%	57	8%	13	2%	3	0%	3	0%	1	0%			709
Latvia	275	70%	107	27%	7	2%	3	1%									392
Lithuania	50	13%	350	88%													400
Luxembourg	92	29%	109	35%	63	20%	40	13%	7	2%	1	0%			1	0%	313
Poland	115	10%	869	74%	187	16%	2	0%			2	0%			1	0%	1,176
Portugal	397	60%	211	32%	25	4%	25	4%									658
Slovakia	86	22%	200	52%	98	25%									1	0%	385
Slovenia	43	10%	169	39%	208	48%	10	2%	1	0%							431
Spain	207	8%	1,452	55%	417	16%	330	13%	174	7%	37	1%			2	0%	2,619
Sweden	5	1%	297	75%	25	6%	64	16%	3	1%							394
The Netherlands	13	1%	1,071	99%	3	0%											1,087
The United Kingdom			465	73%	51	8%	111	17%	12	2%							639
EU	3,047	16%	9,883	53%	3,163	17%	1,641	9%	605	3%	168	1%	52	0%	43	0%	18,602
Norway	16	4%	280	69%	35	9%	59	14%	14	3%	2	0%	2	0%		0%	408

Figure VI.8. Distribution of the number of slaughter pig lymph node samples by the number of days delay between the sampling date and the starting date of testing for *Salmonella*, in the EU and Norway, 2006-2007.

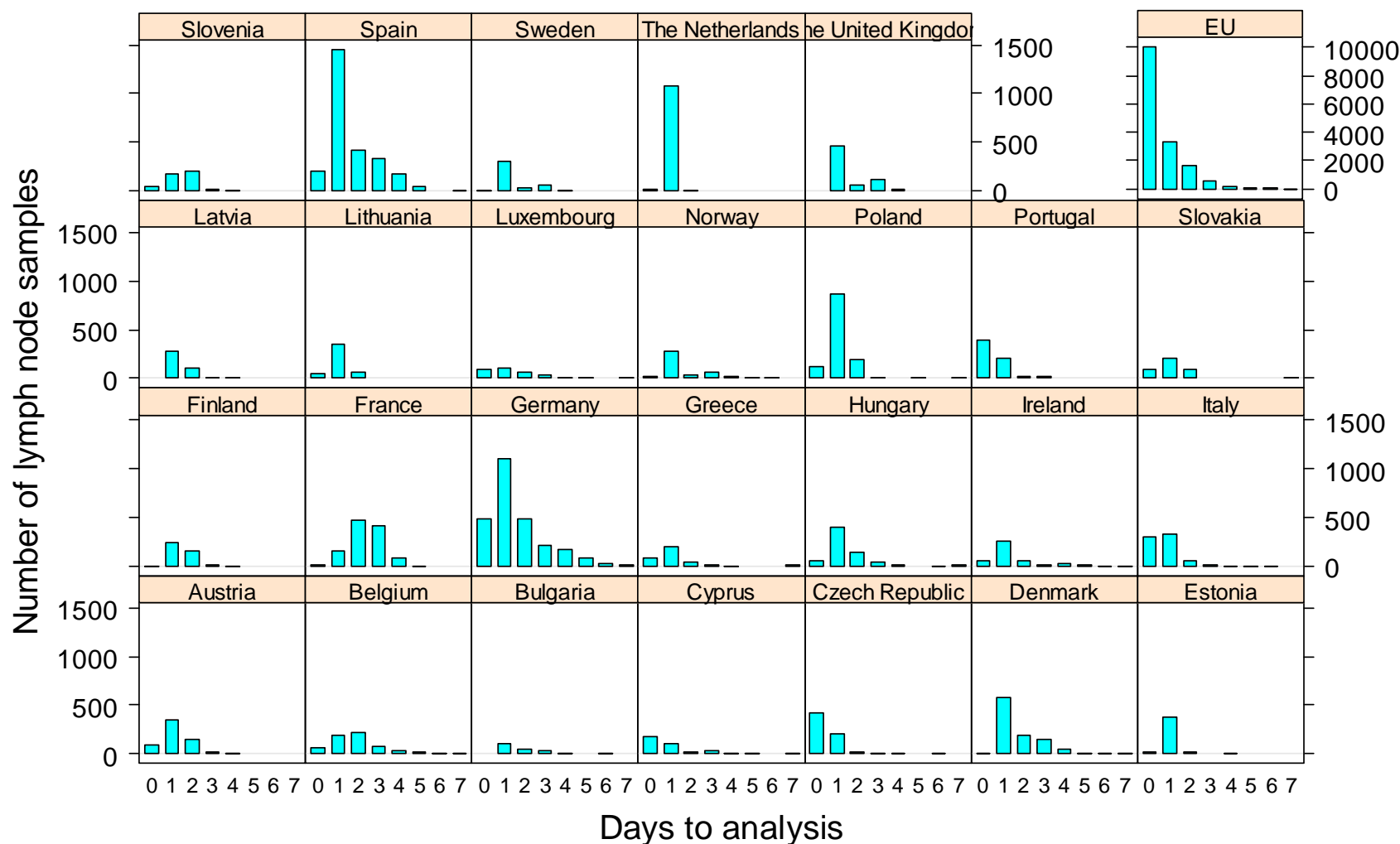


Table VI.8. Distribution of the number of slaughter pig carcass swabs by the number of days delay between the sampling date and the starting date of detection testing for *Salmonella*, in the 13-MS group, 2006-2007.

Country	Number of days delay between sampling date and starting date of detection testing for CS														Total		
	0		1		2		3		4		5		6			7	
	N	Percent	N	Percent	N	Percent	N	Percent	N	Percent	N	Percent	N	Percent		N	Percent
Austria	89	14%	342	55%	155	25%	23	4%	8	1%							617
Belgium	27	7%	134	35%	127	33%	49	13%	19	5%	15	4%	6	2%	4	1%	381
Cyprus	185	52%	99	28%	15	4%	38	11%	10	3%	7	2%			5	1%	359
Czech Republic	264	63%	132	32%	13	3%	5	1%	2	0%			1	0%			417
Denmark	1	0%	198	58%	71	21%	53	15%	17	5%	4	1%	0	0%	0	0%	344
France	7	2%	63	15%	154	37%	152	37%	35	8%	1	0%			1		413
Ireland	52	12%	256	61%	62	15%	12	3%	31	7%	6	1%	2	0%	1	0%	422
Latvia	3	1%	274	70%	104	27%	7	2%	3	1%							391
Lithuania	50	11%	351	76%	60	13%											461
Poland	59	13%	335	75%	51	11%		0%			1	0%	1	0%			447
Slovenia	84	19%	192	44%	148	34%	10	2%	4	1%	3	1%					441
Sweden	6	1%	303	75%	25	6%	64	16%	4	1%							402
The United Kingdom			467	73%	51	8%	111	17%	12	2%							641
13-MS group	827	14%	3,146	55%	1,036	18%	524	9%	145	3%	37	1%	10	0%	11	0%	5,736

Figure VI.9. Distribution of the number of slaughter pig carcass swabs by the number of days delay between the sampling date and the starting date of detection testing for *Salmonella*, in the 13-MS group, 2006-2007.

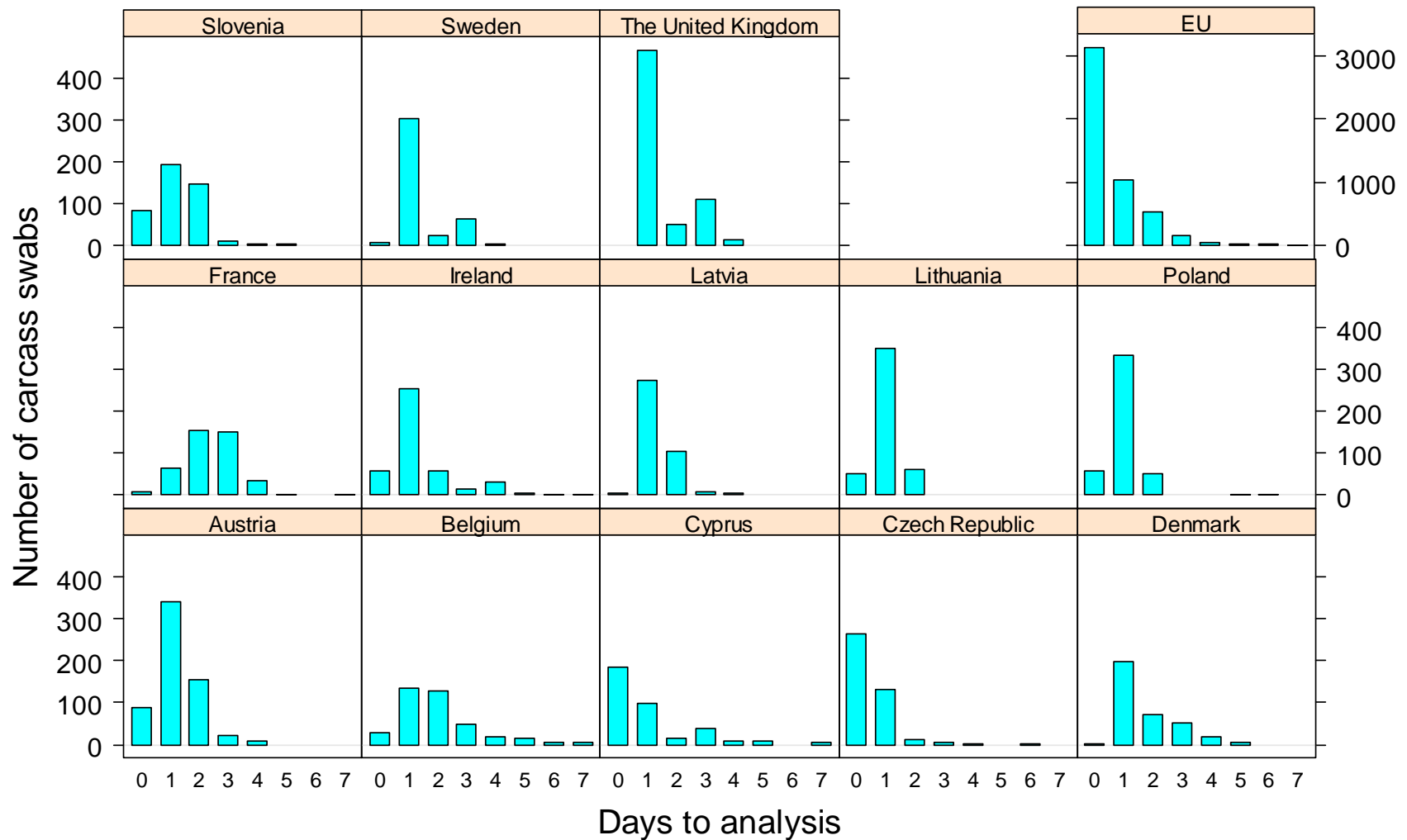


Table VI.9. Number and raw proportions (%) of *Salmonella*-positive slaughter pig lymph nodes, in EU and Norway, 2006-2007

Member State	N total	<i>Salmonella</i> spp.		<i>S. Typhimurium</i>		<i>S. Derby</i>		Serovars other than <i>S. Typhimurium</i> and <i>S. Derby</i>	
		N positive	Raw Pos. %	N positive	Raw Pos. %	N positive	Raw Pos. %	N positive	Raw Pos. %
Austria	617	13	2.1	4	0.6	2	0.3	7	1.1
Belgium	601	78	13.0	45	7.5	7	1.2	26	4.3
Bulgaria	176	35	19.9	4	2.3	11	6.3	20	11.4
Cyprus	359	47	13.1	4	1.1	0	0.0	43	12.0
Czech Republic	654	38	5.8	12	1.8	7	1.1	19	2.9
Denmark	998	80	8.0	46	4.6	14	1.4	20	2.0
Estonia	420	27	6.4	7	1.7	0	0.0	20	4.8
Finland	419	0	0.0	0	0.0	0	0.0	0	0.0
France	1,163	215	18.5	89	7.7	76	6.5	50	4.3
Germany	2,567	325	12.7	180	7.0	29	1.1	116	4.5
Greece	345	73	21.2	12	3.5	9	2.6	52	15.1
Hungary	658	76	11.6	27	4.1	8	1.2	41	6.2
Ireland	422	65	15.4	40	9.5	9	2.1	16	3.8
Italy	709	116	16.4	12	1.7	39	5.5	65	9.2
Latvia	392	21	5.4	1	0.3	8	2.0	12	3.1
Lithuania	461	8	1.7	6	1.3	0	0.0	2	0.4
Luxembourg	313	50	16.0	36	11.5	5	1.6	9	2.9
Poland	1,176	75	6.4	14	1.2	7	0.6	54	4.6
Portugal	658	156	23.7	57	8.7	17	2.6	82	12.5
Slovakia	385	30	7.8	4	1.0	5	1.3	21	5.5
Slovenia	431	27	6.3	3	0.7	2	0.5	22	5.1
Spain	2,619	804	30.7	290	11.1	82	3.1	432	16.5
Sweden	394	6	1.5	4	1.0	0	0.0	2	0.5
The Netherlands	1,087	92	8.5	55	5.1	14	1.3	23	2.1
The United Kingdom	639	139	21.8	86	13.5	29	4.5	24	3.8
EU	18,663	2,596	13.9	1,038	5.6	380	2.0	1,178	6.3
Norway	408	1	0.2	1	0.2	0	0.0	0	0.0

Table VI.10. Number and raw proportions (%) of *Salmonella*-positive slaughter pig carcass swabs, in 13-MS group, 2006-2007

Member State	N total	<i>Salmonella</i> spp.		<i>S. Typhimurium</i>		<i>S. Derby</i>		Serovars other than <i>S. Typhimurium</i> and <i>S. Derby</i>	
		N positive	Raw Pos. %	N positive	Raw Pos. %	N positive	Raw Pos. %	N positive	Raw Pos. %
Austria	617	7	1.1	3	0.5	3	0.5	1	0.2
Belgium	381	73	19.2	46	12.1	15	3.9	12	3.1
Cyprus	359	10	2.8	2	0.6	0	0.0	8	2.2
Czech Republic	417	19	4.6	8	1.9	4	1.0	7	1.7
Denmark	344	10	2.9	5	1.5	2	0.6	3	0.9
France	413	77	18.6	34	8.2	27	6.5	16	3.9
Ireland	422	71	16.8	40	9.5	13	3.1	18	4.3
Latvia	391	8	2.0	0	0.0	2	0.5	6	1.5
Lithuania	461	8	1.7	3	0.7	2	0.4	3	0.7
Poland	447	7	1.6	3	0.7	3	0.7	1	0.2
Slovenia	441	0	0.0	0	0.0	0	0.0	0	0.0
Sweden	402	0	0.0	0	0.0	0	0.0	0	0.0
The United Kingdom	641	97	15.1	47	7.3	22	3.4	28	4.4
13-MS group	5,736	387	6.7	191	3.3	93	1.6	103	1.8

Table VI.11. Number and raw proportions (%) of slaughter pig meat juice samples and sera with antibodies against *Salmonella*, in the 9-MS group, 2006-2007

	N total	Seropositive to <i>Salmonella</i>	
		N positive	Raw Pos. % ^a
Cyprus	359	61	17
Denmark	980	71	7
France	1,158	113	10
Ireland	421	43	10
Lithuania	462	57	12
Slovenia	439	50	11
Sweden	401	13	3
The Netherlands	1,111	75	7
The United Kingdom	641	163	25

^a These raw proportions (%) of samples with antibodies against *Salmonella* are not comparable between MSs, because of different assays and different thresholds used within participating MSs.

Annex VII. Results of the prevalence estimation in lymph node samples and carcass swabs of slaughter pigs in the EU and Norway, 2006-2007

Since the *Salmonella* serovars Derby and Typhimurium accounted for 55% of the infections observed in the lymph node samples, and 74% of the infections in the carcass swabs, the prevalences of those serovars have been studied in more detail in lymph node and carcass swab samples in addition to the *Salmonella* spp. prevalence. The prevalence estimations accounting for aspects of clustering and of weighting were obtained using GEE with either an independent or an exchangeable working correlation structure.

Ileo-caecal lymph node samples

The unweighted and weighted prevalence estimates of ‘*Salmonella* spp.’, ‘*S. Derby*’, ‘*S. Typhimurium*’ and ‘*Salmonella* serovars other than Derby or Typhimurium’ in lymph node samples of slaughter pigs are displayed in Tables VII.1. and VII.2.

When no positive samples were observed in a Member State, confidence intervals cannot be estimated and are therefore left blank in the tables. On the other hand, there was no Eurostat information available about the national throughput of Bulgaria for 2005. As a result, WY1 for Bulgaria could not be determined and its data are not taken into account in the prevalence estimates for the EU (unweighted and weighted, to be able to correctly compare the estimates).

Further, observe that using weights in this study does not have a big impact on the estimates at this level, at least compared to the method without weights (however, taking into account clustering). This is the result of a good implementation of the randomization setup in the sampling design.

Carcass swabs

The unweighted and weighted prevalence estimates of ‘*Salmonella* spp.’, ‘*S. Derby*’, ‘*S. Typhimurium*’, and ‘*Salmonella* serovars other than Derby or Typhimurium’ for the 13 MS countries having carried out the carcass swab bacteriology test are displayed in Table VII.3. and VII.4.

The weighted prevalence of *Salmonella* spp. in carcass swabs in the 13-MS group was estimated as 8.3% [6.3%:11.0%]. The weighted prevalence of *Salmonella* spp. in lymph node samples in the same 13-MS group was estimated as 9.6% [8.2%:11.1%]. The 13-MS group level estimate of *Salmonella* spp. prevalence in lymph node samples appears to be similar to that in carcass swabs.

Table VII.1. Unweighted prevalence estimates and 95% confidence intervals for the *Salmonella* positive lymph node samples in slaughter-pigs by outcome variables, in the EU and Norway, 2006-2007.

Country	<i>Salmonella</i> spp.			<i>S. Derby</i>			<i>S. Typhimurium</i>			Other <i>Salmonella</i> serovars		
	Estimate	LB	UB	Estimate	LB	UB	Estimate	LB	UB	Estimate	LB	UB
Austria	0.020	0.011	0.037	0.003	0.001	0.012	0.007	0.002	0.021	0.011	0.005	0.023
Belgium	0.139	0.101	0.188	0.014	0.005	0.038	0.078	0.054	0.111	0.046	0.028	0.074
Bulgaria	0.178	0.106	0.283	0.052	0.019	0.134	0.019	0.008	0.041	0.103	0.055	0.185
Cyprus	0.125	0.101	0.154	0.000			0.010	0.008	0.014	0.116	0.092	0.145
Czech Republic	0.058	0.041	0.081	0.011	0.005	0.027	0.018	0.009	0.034	0.029	0.017	0.048
Denmark	0.080	0.064	0.100	0.014	0.010	0.022	0.046	0.035	0.058	0.020	0.015	0.027
Estonia	0.062	0.039	0.098	0.000			0.022	0.019	0.025	0.048	0.031	0.072
Finland	0.000			0.000			0.000			0.000		
France	0.184	0.159	0.213	0.066	0.057	0.077	0.076	0.059	0.098	0.043	0.032	0.057
Germany	0.113	0.092	0.139	0.012	0.008	0.018	0.062	0.048	0.079	0.045	0.035	0.057
Greece	0.226	0.164	0.304	0.029	0.013	0.064	0.038	0.019	0.075	0.155	0.112	0.210
Hungary	0.086	0.060	0.123	0.012	0.006	0.023	0.025	0.014	0.045	0.055	0.036	0.085
Ireland	0.163	0.161	0.165	0.024	0.023	0.025	0.091	0.090	0.092	0.038	0.023	0.061
Italy	0.162	0.140	0.186	0.055	0.041	0.074	0.017	0.010	0.030	0.094	0.073	0.120
Latvia	0.055	0.033	0.091	0.022	0.007	0.066	0.003	0.000	0.016	0.031	0.016	0.058
Lithuania	0.018	0.008	0.039	0.000			0.014	0.005	0.038	0.004	0.001	0.014
Luxembourg	0.167	0.113	0.241	0.014	0.011	0.018	0.116	0.082	0.162	0.028	0.019	0.042
Poland	0.063	0.049	0.080	0.001	0.000	0.004	0.013	0.008	0.021	0.047	0.036	0.062
Portugal	0.237	0.196	0.283	0.026	0.013	0.049	0.085	0.062	0.114	0.122	0.103	0.143
Slovakia	0.074	0.047	0.116	0.013	0.005	0.031	0.010	0.004	0.024	0.052	0.031	0.086
Slovenia	0.063	0.043	0.090	0.006	0.001	0.024	0.007	0.002	0.020	0.052	0.035	0.076
Spain	0.296	0.254	0.342	0.029	0.018	0.045	0.109	0.089	0.133	0.162	0.135	0.193
Sweden	0.013	0.012	0.013	0.000			0.010	0.005	0.020	0.005	0.003	0.009
The Netherlands	0.085	0.073	0.098	0.013	0.008	0.021	0.049	0.047	0.050	0.021	0.014	0.032
The United Kingdom	0.212	0.178	0.252	0.048	0.037	0.063	0.138	0.120	0.159	0.038	0.025	0.055
EU	0.108	0.099	0.118	0.018	0.015	0.021	0.042	0.037	0.047	0.056	0.050	0.063
Norway	0.002	0.000	0.016	0.000	0.000	0.016	0.000			0.000		

The unweighted prevalence accounts for the aspects of clustering only. LB = lower bound of 95% confidence interval / UB = upper bound of 95% confidence interval

The '*S. Typhimurium*', '*S. Derby*' and '*Salmonella* serovars other than *S. Typhimurium* and *S. Derby*' prevalence estimates do not add up to the '*Salmonella* spp.' prevalence estimates due to some rounding errors in the estimation process.

Table VII.2. Weighted prevalence estimates and 95% confidence intervals for the *Salmonella* positive lymph node samples in slaughter-pigs by outcome variable, in the EU and Norway, 2006-2007.

Country	<i>Salmonella</i> spp.			<i>S. Derby</i>			<i>S. Typhimurium</i>			Other <i>Salmonella</i> serovars		
	Estimate	LB	UB	Estimate	LB	UB	Estimate	LB	UB	Estimate	LB	UB
Austria	0.020	0.011	0.036	0.003	0.001	0.011	0.007	0.002	0.020	0.011	0.005	0.023
Belgium	0.139	0.098	0.193	0.013	0.004	0.036	0.078	0.053	0.115	0.049	0.030	0.079
Bulgaria	0.167	0.081	0.314	0.049	0.013	0.164	0.018	0.006	0.049	0.101	0.049	0.197
Cyprus	0.124	0.101	0.152	0.000			0.010	0.008	0.013	0.115	0.091	0.145
Czech Republic	0.058	0.038	0.089	0.014	0.005	0.041	0.016	0.008	0.033	0.027	0.016	0.045
Denmark	0.077	0.055	0.107	0.013	0.008	0.022	0.045	0.034	0.059	0.020	0.014	0.030
Estonia	0.047	0.023	0.094	0.000			0.011	0.006	0.021	0.038	0.017	0.083
Finland	0.000			0.000			0.000			0.000		
France	0.181	0.160	0.205	0.065	0.056	0.074	0.071	0.054	0.095	0.045	0.032	0.063
Germany	0.109	0.088	0.135	0.012	0.008	0.018	0.061	0.047	0.078	0.043	0.034	0.055
Greece	0.248	0.180	0.332	0.038	0.016	0.088	0.034	0.016	0.071	0.172	0.117	0.246
Hungary	0.093	0.053	0.158	0.015	0.004	0.052	0.029	0.014	0.059	0.047	0.029	0.076
Ireland	0.161	0.156	0.167	0.024	0.023	0.025	0.091	0.090	0.092	0.036	0.020	0.064
Italy	0.165	0.141	0.191	0.054	0.038	0.077	0.016	0.009	0.026	0.096	0.077	0.121
Latvia	0.056	0.033	0.091	0.019	0.006	0.060	0.003	0.001	0.020	0.034	0.017	0.066
Lithuania	0.018	0.008	0.038	0.000			0.013	0.005	0.038	0.005	0.002	0.015
Luxembourg	0.224	0.127	0.364	0.015	0.007	0.028	0.161	0.088	0.276	0.040	0.016	0.096
Poland	0.051	0.037	0.069	0.001	0.000	0.002	0.014	0.008	0.025	0.035	0.025	0.049
Portugal	0.234	0.194	0.280	0.025	0.013	0.047	0.084	0.061	0.115	0.121	0.103	0.142
Slovakia	0.048	0.026	0.089	0.011	0.004	0.027	0.008	0.003	0.021	0.036	0.018	0.068
Slovenia	0.062	0.042	0.091	0.006	0.001	0.026	0.007	0.002	0.020	0.051	0.034	0.075
Spain	0.290	0.249	0.335	0.028	0.018	0.043	0.106	0.086	0.131	0.161	0.135	0.191
Sweden	0.013	0.012	0.015	0.000			0.012	0.005	0.027	0.005	0.003	0.009
The Netherlands	0.085	0.073	0.098	0.013	0.008	0.021	0.049	0.047	0.050	0.021	0.014	0.032
The United Kingdom	0.212	0.178	0.250	0.048	0.036	0.063	0.138	0.119	0.158	0.038	0.025	0.055
EU	0.103	0.092	0.115	0.021	0.018	0.026	0.047	0.041	0.053	0.050	0.044	0.057
Norway	0.003	0.000	0.016	0.003	0.000	0.016	0.000			0.000		

LB = lower bound of 95% confidence interval / UB = upper bound of 95% confidence interval

The '*S. Typhimurium*', '*S. Derby*' and '*Salmonella* serovars other than *S. Typhimurium* and *S. Derby*' prevalence estimates do not add up to the '*Salmonella* spp.' prevalence estimates due to some rounding errors in the estimation process.

Table VII.3. Unweighted prevalence estimates and 95% confidence intervals for the *Salmonella* positive carcass swabs by outcome variable, in the 13-MS group, 2006-2007.

Country	<i>Salmonella</i> spp.			<i>S. Derby</i>			<i>S. Typhimurium</i>			Other <i>Salmonella</i> serovars		
	Estimate	LB	UB	Estimate	LB	UB	Estimate	LB	UB	Estimate	LB	UB
Austria	0.011	0.004	0.033	0.006	0.001	0.040	0.004	0.001	0.015	0.002	0.000	0.012
Belgium	0.190	0.149	0.238	0.041	0.023	0.072	0.108	0.069	0.165	0.031	0.020	0.048
Cyprus	0.033	0.032	0.034	0.000	0.000	0.000	0.005	0.005	0.005	0.027	0.025	0.030
Czech Republic	0.043	0.026	0.069	0.009	0.003	0.025	0.016	0.007	0.037	0.016	0.007	0.037
Denmark	0.030	0.013	0.065	0.009	0.004	0.017	0.014	0.007	0.031	0.010	0.003	0.038
France	0.184	0.138	0.242	0.064	0.040	0.101	0.082	0.058	0.114	0.041	0.022	0.075
Ireland	0.189	0.103	0.320	0.032	0.013	0.080	0.111	0.060	0.197	0.044	0.023	0.081
Latvia	0.023	0.009	0.056	0.005	0.001	0.035	0.000			0.017	0.006	0.053
Lithuania	0.016	0.007	0.040	0.005	0.002	0.014	0.006	0.002	0.023	0.007	0.003	0.016
Poland	0.014	0.006	0.032	0.004	0.001	0.016	0.007	0.002	0.020	0.002	0.000	0.016
Slovenia	0.000			0.000			0.000			0.000		
Sweden	0.000			0.000			0.000			0.000		
The United Kingdom	0.135	0.099	0.182	0.031	0.018	0.052	0.073	0.053	0.098	0.038	0.022	0.066
13-MS group	0.059	0.048	0.072	0.017	0.012	0.023	0.030	0.023	0.039	0.017	0.013	0.023

The unweighted prevalence accounts for the aspects of clustering only.

LB = lower bound of 95% confidence interval / UB = upper bound of 95% confidence interval

The ‘*S. Typhimurium*’, ‘*S. Derby*’ and ‘*Salmonella* serovars other than *S. Typhimurium* and *S. Derby*’ prevalence estimates do not add up to the ‘*Salmonella* spp.’ prevalence estimates due to some rounding errors in the estimation process.

Table VII.4. Weighted prevalence estimates and 95% confidence intervals for the *Salmonella* positive carcass swabs by outcome variable, in the 13-MS group, 2006-2007.

Country	<i>Salmonella</i> spp.			<i>S. Derby</i>			<i>S. Typhimurium</i>			Other <i>Salmonella</i> serovars		
	Estimate	LB	UB	Estimate	LB	UB	Estimate	LB	UB	Estimate	LB	UB
Austria	0.012	0.004	0.037	0.007	0.001	0.046	0.004	0.001	0.014	0.002	0.000	0.014
Belgium	0.188	0.141	0.246	0.038	0.021	0.067	0.109	0.069	0.168	0.031	0.019	0.049
Cyprus	0.033	0.032	0.034	0.000	0.000	0.000	0.005	0.005	0.005	0.028	0.026	0.030
Czech Republic	0.037	0.022	0.063	0.009	0.003	0.026	0.013	0.005	0.035	0.013	0.005	0.032
Denmark	0.033	0.013	0.085	0.005	0.002	0.015	0.016	0.006	0.042	0.013	0.004	0.048
France	0.176	0.118	0.254	0.059	0.033	0.105	0.070	0.039	0.121	0.048	0.026	0.087
Ireland	0.200	0.108	0.340	0.035	0.014	0.088	0.117	0.064	0.205	0.046	0.024	0.087
Latvia	0.033	0.012	0.089	0.005	0.001	0.032	0.000			0.029	0.009	0.091
Lithuania	0.016	0.006	0.040	0.005	0.001	0.014	0.006	0.002	0.023	0.007	0.003	0.016
Poland	0.013	0.005	0.032	0.006	0.002	0.025	0.005	0.001	0.017	0.001	0.000	0.008
Slovenia	0.000			0.000			0.000			0.000		
Sweden	0.000			0.000			0.000			0.000		
The United Kingdom	0.135	0.099	0.181	0.031	0.018	0.052	0.072	0.053	0.097	0.038	0.022	0.066
13 MS-group	0.083	0.063	0.110	0.026	0.017	0.039	0.039	0.028	0.055	0.023	0.016	0.035

LB = lower bound of 95% confidence interval / UB = upper bound of 95% confidence interval

The '*S. Typhimurium*', '*S. Derby*' and '*Salmonella* serovars other than *S. Typhimurium* and *S. Derby*' prevalence estimates do not add up to the '*Salmonella* spp.' prevalence estimates due to some rounding errors in the estimation process.

Annex VIII. Concordance-discordance between the MS-specific results of the lymph nodes bacteriological tests and of the antibody detection test, for 9 MSs, in the slaughter pig baseline survey, in the EU and Norway, 2006-2007

The agreement between the test results of the lymph nodes and of the serological samples was investigated by calculating the Kappa Coefficient and its corresponding confidence interval for each of the 9 participating MSs. The Kappa coefficient calculated here focuses only on the positive and negative results for the meat juice and sera samples, ignoring the inconclusive outcomes. From this measure of agreement there appears to be no to low agreement between the results from the lymph node and serological tests within the participating MSs.

Country	Lymph nodes	Meat juice and sera				Total	Missing ¹	Kappa coefficient ²
		negative	positive	inconclusive				
Cyprus	negative	213	53	46	312		-0.01 [-0.12, 0.10]	
	positive	34	8	5	47			
	Total	247	61	51	359	0		
Denmark	negative	854	48		902		0.25 [0.15, 0.35]	
	positive	55	23		78			
	Total	909	71		980	18		
France	negative	884	59		943		0.23 [0.16, 0.30]	
	positive	160	54		214			
	Total	1044	113		1157	7		
Ireland	negative	328	28		356		0.18 [0.06, 0.30]	
	positive	50	15		65			
	Total	378	43		421	1		
Lithuania	negative	382	53	18	453		0.07 [-0.12, 0.17]	
	positive	3	3	2	8			
	Total	385	56	20	461	0		
Slovenia	negative	358	43		401		0.08 [-0.03, 0.20]	
	positive	21	6		27			
	Total	379	49		428	14		
Sweden	negative	324	12	51	387		0.09 [-0.11, 0.29]	
	positive	4	1	1	6			
	Total	328	13	52	393	9		
The Netherlands	negative	929	52	14	995		0.22 [0.13, 0.32]	
	positive	66	23	3	92			
	Total	995	75	17	1087	24		
The United Kingdom	negative	408	92		500		0.31 [0.22, 0.39]	
	positive	68	71		139			
	Total	476	163		639	2		

¹ Missing means the number of samples for which one or both test results were missing.

² The κ was calculated focusing only on the positive and negative results for the serological samples, ignoring the inconclusive outcomes.

Annex IX. Frequency distribution of *Salmonella* serovars in lymph node samples of slaughter pigs, in the EU and Norway, 2006-2007

Austria	Lymph node samples with serovars	N	%
	<i>S. Enteritidis</i>	5	35.7
	<i>S. Typhimurium</i>	4	28.6
	<i>S. Derby</i>	2	14.3
	<i>S. Infantis</i>	1	7.1
	<i>S. Ohio</i>	1	7.1
	<i>S. Thompson</i>	1	7.1
	Total isolates	14	

Belgium	Lymph node samples with serovars	N	%
	<i>S. Typhimurium</i>	45	57.7
	<i>S. Anatum</i>	9	11.5
	<i>S. Derby</i>	7	9.0
	<i>S. Enteritidis</i>	3	3.8
	<i>S. Montevideo</i>	2	2.6
	<i>S. 3,10:-:1,7</i>	1	1.3
	<i>S. 6,7:-:1,w</i>	1	1.3
	<i>S. Bareilly</i>	1	1.3
	<i>S. Coeln</i>	1	1.3
	<i>S. Eboko</i>	1	1.3
	<i>S. Freetown</i>	1	1.3
	<i>S. Livingstone</i>	1	1.3
	<i>S. Rissen</i>	1	1.3
	<i>S. Senftenberg</i>	1	1.3
	<i>S. Thompson</i>	1	1.3
	<i>S. Virchow</i>	1	1.3
Incomplete serotyping	<i>Salmonella</i> Group B	1	1.3
	Total isolates	78	

Bulgaria	Lymph node samples with serovars	N	%
	<i>S. Derby</i>	11	31.4
	<i>S. Infantis</i>	6	17.1
	<i>S. Typhimurium</i>	4	11.4
	<i>S. Bonariensis</i>	3	8.6
	<i>S. Essen</i>	3	8.6
	<i>S. Colindale</i>	2	5.7
	<i>S. Choleraesuis</i>	1	2.9
	<i>S. Give</i>	1	2.9
Incomplete serotyping	<i>S. enterica</i> subsp. <i>enterica</i>	4	11.4
	Total isolates	35	

Cyprus	Lymph node samples with serovars	N	%
	<i>S. Enteritidis</i>	8	17.0
	<i>S. Anatum</i>	4	8.5
	<i>S. Kottbus</i>	4	8.5
	<i>S. London</i>	4	8.5
	<i>S. Typhimurium</i>	4	8.5
	<i>S. Kedougou</i>	3	6.4
	<i>S. Bredeney</i>	2	4.3
	<i>S. Goldcoast</i>	2	4.3
	<i>S. 4,[5],12:i:-</i>	1	2.1
	<i>S. Hillingdon</i>	1	2.1
	<i>S. Infantis</i>	1	2.1
	<i>S. Montevideo</i>	1	2.1
	<i>S. O 6,7:Z29</i>	1	2.1
	<i>S. Teddington</i>	1	2.1
Incomplete serotyping	<i>Salmonella</i> untypeable	5	10.6
	<i>S. enterica</i> subsp. <i>enterica</i>	3	6.4
	<i>Salmonella</i> Group B	2	4.3
	Total isolates	47	

Czech Rep.	Lymph node samples with serovars	N	%
	<i>S. Typhimurium</i>	12	31.6
	<i>S. Enteritidis</i>	10	26.3
	<i>S. Derby</i>	7	18.4
	<i>S. Agona</i>	5	13.2
	<i>S. Infantis</i>	1	2.6
	<i>S. London</i>	1	2.6
	<i>S. Montevideo</i>	1	2.6
	<i>S. Muenchen</i>	1	2.6
	Total isolates	38	

Germany	Lymph node samples with serovars	N	%
	<i>S. Typhimurium</i>	180	55.4
	<i>S. Derby</i>	29	8.9
	<i>S. Enteritidis</i>	10	3.1
	<i>S. Infantis</i>	8	2.5
	<i>S. Brandenburg</i>	4	1.2
	<i>S. London</i>	4	1.2
	<i>S. Agona</i>	3	0.9
	<i>S. Anatum</i>	3	0.9
	<i>S. Eboko</i>	2	0.6
	<i>S. Livingstone</i>	2	0.6
	<i>S. Ohio</i>	2	0.6
	<i>S. Agama</i>	1	0.3
	<i>S. Braenderup</i>	1	0.3
	<i>S. Give</i>	1	0.3
	<i>S. Goldcoast</i>	1	0.3
	<i>S. Kedougou</i>	1	0.3
	<i>S. Lexington</i>	1	0.3
	<i>S. Paratyphi B var. Java</i>	1	0.3
	<i>S. Rissen</i>	1	0.3
Incomplete serotyping	<i>Salmonella</i> Group B	64	19.7
	<i>Salmonella</i> untypeable	5	1.5
	<i>S. enterica</i> subsp. <i>houtenae</i>	1	0.3
	Total isolates	325	

Denmark	Lymph node samples with serovars	N	%
	<i>S. Typhimurium</i>	46	57.5
	<i>S. Derby</i>	14	17.5
	<i>S. Infantis</i>	9	11.3
	<i>S. 4,[5],12:i:-</i>	1	1.3
	<i>S. 9,12:l,v:-</i>	1	1.3
	<i>S. Adelaide</i>	1	1.3
	<i>S. Agona</i>	1	1.3
	<i>S. Braenderup</i>	1	1.3
	<i>S. Goettingen</i>	1	1.3
	<i>S. Livingstone</i>	1	1.3
	<i>S. Newport</i>	1	1.3
	<i>S. Ohio</i>	1	1.3
Incomplete serotyping	<i>Salmonella</i> Group B	1	1.3
	<i>Salmonella</i> untypeable	1	1.3
	Total isolates	80	

Estonia	Lymph node samples with serovars	N	%
	<i>S. Enteritidis</i>	9	33.3
	<i>S. Typhimurium</i>	7	25.9
	<i>S. Lexington</i>	5	18.5
	<i>S. Senftenberg</i>	2	7.4
Incomplete serotyping	<i>S. enterica</i> subsp. <i>enterica</i>	4	14.8
	Total isolates	27	

Spain	Lymph node samples with serovars	N	%
	<i>S. Typhimurium</i>	291	36.1
	<i>S. Rissen</i>	126	15.6
	<i>S. 4,[5],12:i:-</i>	97	12.0
	<i>S. Derby</i>	82	10.2
	<i>S. Anatum</i>	30	3.7
	<i>S. Bredeney</i>	28	3.5
	<i>S. London</i>	11	1.4
	<i>S. Brandenburg</i>	9	1.1
	<i>S. Enteritidis</i>	9	1.1
	<i>S. Newport</i>	9	1.1
	<i>S. Goldcoast</i>	7	0.9
	<i>S. Istanbul</i>	6	0.7
	<i>S. Montevideo</i>	6	0.7
	<i>S. Mikawasima</i>	5	0.6
	<i>S. Hadar</i>	4	0.5
	<i>S. Muenchen</i>	4	0.5
	<i>S. Bardo</i>	3	0.4
	<i>S. Brikama</i>	3	0.4
	<i>S. Choleraesuis</i> var. <i>Kunzendorf</i>	3	0.4
	<i>S. Agona</i>	2	0.2
	<i>S. Mbandaka</i>	2	0.2
	<i>S. Augustenborg</i>	1	0.1
	<i>S. Grumpensis</i>	1	0.1
	<i>S. Havana</i>	1	0.1
	<i>S. Indiana</i>	1	0.1
	<i>S. Meleagridis</i>	1	0.1
	<i>S. Offa</i>	1	0.1
	<i>S. Ohio</i>	1	0.1
Incomplete serotyping	<i>Salmonella</i> untypeable	62	7.7
	Total isolates	806	

France	Lymph node samples with serovars	N	%
	<i>S. Typhimurium</i>	89	41.4
	<i>S. Derby</i>	76	35.3
	<i>S. Agona</i>	5	2.3
	<i>S. Infantis</i>	5	2.3
	<i>S. Brandenburg</i>	4	1.9
	<i>S. Schwarzengrund</i>	4	1.9
	<i>S. Bredeney</i>	3	1.4
	<i>S. IIIa 48:z4,z23:-</i>	3	1.4
	<i>S. Anatum</i>	2	0.9
	<i>S. Enteritidis</i>	2	0.9
	<i>S. Kedougou</i>	2	0.9
	<i>S. Newport</i>	2	0.9
	<i>S. Bovismorbificans</i>	1	0.5
	<i>S. Bradford</i>	1	0.5
	<i>S. Coeln</i>	1	0.5
	<i>S. Goldcoast</i>	1	0.5
	<i>S. Hadar</i>	1	0.5
	<i>S. Indiana</i>	1	0.5
	<i>S. Mbandaka</i>	1	0.5
	<i>S. Montevideo</i>	1	0.5
	<i>S. Saintpaul</i>	1	0.5
	<i>S. Stourbridge</i>	1	0.5
	<i>S. Tennessee</i>	1	0.5
	<i>S. Veneziana</i>	1	0.5
Incomplete serotyping	<i>Salmonella</i> untypeable	5	2.3
	<i>S. enterica</i> subsp. <i>houtenae</i>	1	0.5
	Total isolates	215	

Greece	Lymph node samples with serovars	N	%
	<i>S. Typhimurium</i>	12	16.4
	<i>S. Derby</i>	9	12.3
	<i>S. Thompson</i>	5	6.8
	<i>S. Bredeney</i>	3	4.1
	<i>S. Enteritidis</i>	3	4.1
	<i>S. Kottbus</i>	3	4.1
	<i>S. Montevideo</i>	3	4.1
	<i>S. Umbilo</i>	3	4.1
	<i>S. 4,[5],12:i:-</i>	2	2.7
	<i>S. Blockley</i>	2	2.7
	<i>S. Muenster</i>	2	2.7
	<i>S. Oranienburg</i>	2	2.7
	<i>S. Agona</i>	1	1.4
	<i>S. Anatum</i>	1	1.4
	<i>S. Bovismorbificans</i>	1	1.4
	<i>S. Brandenburg</i>	1	1.4
	<i>S. Carno</i>	1	1.4
	<i>S. Dublin</i>	1	1.4
	<i>S. Hermannswerder</i>	1	1.4
	<i>S. London</i>	1	1.4
	<i>S. Menden</i>	1	1.4
	<i>S. Mishmarhaemek</i>	1	1.4
	<i>S. Newport</i>	1	1.4
	<i>S. Paratyphi B var. Java</i>	1	1.4
	<i>S. Szentes</i>	1	1.4
Incomplete serotyping	<i>S. enterica</i> subsp. <i>enterica</i>	8	11.0
	<i>Salmonella</i> untypeable	2	2.7
	<i>S. enterica</i>	1	1.4
	Total isolates	73	
Hungary	Lymph node samples with serovars	N	%
	<i>S. Typhimurium</i>	27	35.5
	<i>S. Enteritidis</i>	12	15.8
	<i>S. Derby</i>	8	10.5
	<i>S. Infantis</i>	6	7.9
	<i>S. Bovismorbificans</i>	5	6.6
	<i>S. 4,[5],12:i:-</i>	4	5.3
	<i>S. London</i>	4	5.3
	<i>S. Bredeney</i>	3	3.9
	<i>S. Agona</i>	2	2.6
	<i>S. Brandenburg</i>	1	1.3
	<i>S. Give</i>	1	1.3
	<i>S. Montevideo</i>	1	1.3
	<i>S. Rissen</i>	1	1.3
	<i>S. Thompson</i>	1	1.3
	Total isolates	76	

Ireland	Lymph node samples with serovars	N	%
	<i>S. Typhimurium</i>	40	61.5
	<i>S. Derby</i>	9	13.8
	<i>S. Bredeney</i>	7	10.8
	<i>S. Infantis</i>	2	3.1
	<i>S. Enteritidis</i>	1	1.5
	<i>S. Goldcoast</i>	1	1.5
	<i>S. Manhattan</i>	1	1.5
	<i>S. Oranienburg</i>	1	1.5
	<i>S. Panama</i>	1	1.5
	<i>S. Virchow</i>	1	1.5
Incomplete serotyping	<i>Salmonella</i> untypeable	1	1.5
	Total isolates	65	

Italy	Lymph node samples with serovars	N	%
	<i>S. Derby</i>	39	33.6
	<i>S. Typhimurium</i>	12	10.3
	<i>S. Anatum</i>	4	3.4
	<i>S. Livingstone</i>	4	3.4
	<i>S. Bovismorbificans</i>	2	1.7
	<i>S. Braenderup</i>	2	1.7
	<i>S. Enteritidis</i>	2	1.7
	<i>S. Bredeney</i>	1	0.9
	<i>S. Infantis</i>	1	0.9
	<i>S. Newport</i>	1	0.9
	<i>S. Thompson</i>	1	0.9
Incomplete serotyping	<i>Salmonella</i> untypeable	41	35.3
	<i>S. enterica</i> subsp. <i>enterica</i>	6	5.2
	Total isolates	116	

Lithuania	Lymph node samples with serovars	N	%
	<i>S. Typhimurium</i>	6	75.0
	<i>S. Bredeney</i>	2	25.0
	Total isolates	8	

Luxembourg	Lymph node samples with serovars	N	%
	<i>S. Typhimurium</i>	36	72.0
	<i>S. Derby</i>	5	10.0
	<i>S. Senftenberg</i>	4	8.0
	<i>S. London</i>	2	4.0
	<i>S. Eboko</i>	1	2.0
	<i>S. Enteritidis</i>	1	2.0
	<i>S. Livingstone</i>	1	2.0
	Total isolates	50	

Latvia	Lymph node samples with serovars	N	%
	<i>S. Brandenburg</i>	8	38.1
	<i>S. Derby</i>	8	38.1
	<i>S. Amersfoort</i>	1	4.8
	<i>S. Enteritidis</i>	1	4.8
	<i>S. Typhimurium</i>	1	4.8
Incomplete serotyping	<i>Salmonella</i> untypeable	2	9.5
	Total isolates	21	

The Netherlands	Lymph node samples with serovars	N	%
	<i>S. Typhimurium</i>	55	59.8
	<i>S. Derby</i>	14	15.2
	<i>S. Brandenburg</i>	4	4.3
	<i>S. London</i>	3	3.3
	<i>S. 4,[5],12:i:-</i>	2	2.2
	<i>S. Panama</i>	2	2.2
	<i>S. Agona</i>	1	1.1
	<i>S. Bovismorbificans</i>	1	1.1
	<i>S. Cerro</i>	1	1.1
	<i>S. Dublin</i>	1	1.1
	<i>S. Goldcoast</i>	1	1.1
	<i>S. Infantis</i>	1	1.1
	<i>S. Virchow</i>	1	1.1
Incomplete serotyping	<i>S. enterica</i> subsp. <i>enterica</i>	2	2.2
	<i>Salmonella</i> untypeable	2	2.2
	<i>Salmonella</i> Group B	1	1.1
	Total isolates	92	

Norway	Lymph node samples with serovars	N	%
	<i>S. Typhimurium</i>	1	100.0
	Total isolates	1	

Poland	Lymph node samples with serovars	N	%
	<i>S. Enteritidis</i>	29	38.7
	<i>S. Typhimurium</i>	14	18.7
	<i>S. Derby</i>	7	9.3
	<i>S. Choleraesuis</i>	3	4.0
	<i>S. Hadar</i>	3	4.0
	<i>S. Infantis</i>	3	4.0
	<i>S. Mbandaka</i>	3	4.0
	<i>S. Newport</i>	3	4.0
	<i>S. Anatum</i>	2	2.7
	<i>S. Bredeney</i>	2	2.7
	<i>S. Virchow</i>	2	2.7
	<i>S. Agona</i>	1	1.3
	<i>S. Essen</i>	1	1.3
	<i>S. Isangi</i>	1	1.3
	<i>S. Senftenberg</i>	1	1.3
	Total isolates	75	

Portugal	Lymph node samples with serovars	N	%
	<i>S. Typhimurium</i>	57	36.5
	<i>S. Rissen</i>	22	14.1
	<i>S. 4,[5],12:i:-</i>	17	10.9
	<i>S. Derby</i>	17	10.9
	<i>S. Enteritidis</i>	9	5.8
	<i>S. Give</i>	7	4.5
	<i>S. Newport</i>	7	4.5
	<i>S. Anatum</i>	6	3.8
	<i>S. Agona</i>	5	3.2
	<i>S. Bovismorbificans</i>	2	1.3
	<i>S. Eboko</i>	1	0.6
	<i>S. Gaminara</i>	1	0.6
	<i>S. Havana</i>	1	0.6
	<i>S. Infantis</i>	1	0.6
	<i>S. Mbandaka</i>	1	0.6
	<i>S. Ohio</i>	1	0.6
	<i>S. Panama</i>	1	0.6
	Total isolates	156	

Sweden	Lymph node samples with serovars	N	%
	<i>S. Typhimurium</i>	4	66.7
	<i>S. Infantis</i>	2	33.3
	Total isolates	6	

Slovenia	Lymph node samples with serovars	N	%
	<i>S. Enteritidis</i>	7	25.9
	<i>S. Typhimurium</i>	3	11.1
	<i>S. Derby</i>	2	7.4
	<i>S. Saintpaul</i>	2	7.4
	<i>S. Virchow</i>	2	7.4
	<i>S. Agona</i>	1	3.7
	<i>S. Coeln</i>	1	3.7
	<i>S. Fyris</i>	1	3.7
	<i>S. Heidelberg</i>	1	3.7
	<i>S. Infantis</i>	1	3.7
	<i>S. Montevideo</i>	1	3.7
	<i>S. Ohio</i>	1	3.7
Incomplete serotyping	<i>Salmonella</i> untypeable	4	14.8
	Total isolates	27	

Slovakia	Lymph node samples with serovars	N	%
	<i>S. Derby</i>	5	16.7
	<i>S. Typhimurium</i>	4	13.3
	<i>S. Abony</i>	3	10.0
	<i>S. Enteritidis</i>	3	10.0
	<i>S. Montevideo</i>	3	10.0
	<i>S. 6,7:-:1,5</i>	2	6.7
	<i>S. Bovismorbificans</i>	2	6.7
	<i>S. Choleraesuis</i> var. Kunzendorf	2	6.7
	<i>S. Agona</i>	1	3.3
	<i>S. Choleraesuis</i>	1	3.3
	<i>S. Havana</i>	1	3.3
	<i>S. II 18:-:-</i>	1	3.3
	<i>S. Infantis</i>	1	3.3
	<i>S. Lomita</i>	1	3.3
	Total isolates	30	

The United Kingdom	Lymph node samples with serovars	N	%
	<i>S. Typhimurium</i>	86	61.9
	<i>S. Derby</i>	29	20.9
	<i>S. Reading</i>	5	3.6
	<i>S. 4,[5],12:i:-</i>	4	2.9
	<i>S. London</i>	3	2.2
	<i>S. Anatum</i>	2	1.4
	<i>S. Enteritidis</i>	2	1.4
	<i>S. Kedougou</i>	2	1.4
	<i>S. Agama</i>	1	0.7
	<i>S. Bovismorbificans</i>	1	0.7
	<i>S. Coeln</i>	1	0.7
	<i>S. Give</i>	1	0.7
	<i>S. Goldcoast</i>	1	0.7
	<i>S. Panama</i>	1	0.7
	Total isolates	139	

Annex X. Frequency distribution of *Salmonella* serovars in carcass swabs of slaughter pigs in the 13-MS group, 2006-2007

No carcass swabs tested positive in Slovenia and Sweden.

Austria	Carcass swabs with serovars	N	%
	<i>S. Derby</i>	3	42.9
	<i>S. Typhimurium</i>	3	42.9
	<i>S. Enteritidis</i>	1	14.3
	Total isolates	7	

Belgium	Carcass swabs with serovars	N	%
	<i>S. Typhimurium</i>	46	63
	<i>S. Derby</i>	15	20.5
	<i>S. Livingstone</i>	3	4.1
	<i>S. 9:I,v:-</i>	1	1.4
	<i>S. Brandenburg</i>	1	1.4
	<i>S. Infantis</i>	1	1.4
	<i>S. Ohio</i>	1	1.4
	<i>S. Rissen</i>	1	1.4
	<i>S. Senegal</i>	1	1.4
Incomplete serotyping	<i>Salmonella</i> untypeable	3	4.1
	Total isolates	73	

Cyprus	Carcass swabs with serovars	N	%
	<i>S. Typhimurium</i>	2	22.2
	<i>S. Enteritidis</i>	1	11.1
	<i>S. Kedougou</i>	1	11.1
	<i>S. O 6,7:Z29</i>	1	11.1
Incomplete serotyping	<i>S. enterica</i> subsp. <i>arizonae</i>	2	22.2
	<i>S. enterica</i> subsp. <i>enterica</i>	1	11.1
	<i>Salmonella</i> Group B	1	11.1
	Total isolates	9	

Czech Republic	Carcass swabs with serovars	N	%
	<i>S. Typhimurium</i>	8	42.1
	<i>S. Derby</i>	4	21.1
	<i>S. Enteritidis</i>	3	15.8
	<i>S. Agona</i>	2	10.5
	<i>S. Infantis</i>	1	5.3
	<i>S. London</i>	1	5.3
	Total isolates	19	

Denmark	Carcass swabs with serovars	N	%
	<i>S. Typhimurium</i>	5	50
	<i>S. Derby</i>	2	20
	<i>S. Infantis</i>	2	20
	<i>S. Livingstone</i>	1	10
	Total isolates	10	

France	Carcass swabs with serovars	N	%
	<i>S. Typhimurium</i>	34	43.6
	<i>S. Derby</i>	28	35.9
	<i>S. Infantis</i>	5	6.4
	<i>S. Bredeney</i>	3	3.8
	<i>S. Brandenburg</i>	2	2.6
	<i>S. Agona</i>	1	1.3
	<i>S. Bradford</i>	1	1.3
	<i>S. Goldcoast</i>	1	1.3
	<i>S. Schwarzengrund</i>	1	1.3
Incomplete serotyping	<i>S. enterica</i> subsp. <i>diarizonae</i>	1	1.3
	<i>Salmonella</i> untypeable	1	1.3
	Total isolates	78	

Ireland	Carcass swabs with serovars	N	%
	<i>S. Typhimurium</i>	40	56.3
	<i>S. Derby</i>	13	18.3
	<i>S. Infantis</i>	4	5.6
	<i>S. Bredeney</i>	2	2.8
	<i>S. Kentucky</i>	1	1.4
	<i>S. Manhattan</i>	1	1.4
	<i>S. Schwarzengrund</i>	1	1.4
	<i>S. Virchow</i>	1	1.4
Incomplete serotyping	<i>Salmonella</i> untypeable	8	11.3
	Total isolates	71	

Lithuania	Carcass swabs with serovars	N	%
	<i>S. Typhimurium</i>	3	37.5
	<i>S. Bredeney</i>	2	25
	<i>S. Derby</i>	2	25
	<i>S. Agona</i>	1	12.5
	Total isolates	8	

Latvia	Carcass swabs with serovars	N	%
	<i>S. Brandenburg</i>	4	50
	<i>S. Derby</i>	2	25
	<i>S. Bredeney</i>	1	12.5
	<i>S. Chartres</i>	1	12.5
	Total isolates	8	

Poland	Carcass swabs with serovars	N	%
	<i>S. Derby</i>	3	42.9
	<i>S. Typhimurium</i>	3	42.9
	<i>S. Hadar</i>	1	14.3
	Total isolates	7	

The United Kingdom	Carcass swabs with serovars	N	%
	<i>S. Typhimurium</i>	47	48.5
	<i>S. Derby</i>	22	22.7
	<i>S. Reading</i>	6	6.2
	<i>S. 4,[5],12:i:-</i>	5	5.1
	<i>S. Kedougou</i>	4	4.1
	<i>S. Panama</i>	3	3.1
	<i>S. 4,5,12:-:1,2</i>	1	1
	<i>S. Anatum</i>	1	1
	<i>S. Bovismorbificans</i>	1	1
	<i>S. Give</i>	1	1
	<i>S. London</i>	1	1
	<i>S. Rissen</i>	1	1
Incomplete serotyping	<i>Salmonella</i> untypeable	4	4.1
	Total isolates	97	

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