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Salmonella control programme - results for 2017: Salmonella in poultry declines slightly

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As part of the EU-wide programme to combat *Salmonella*, the member states compile an annual report on the proportion of *Salmonella*-positive flocks in breeding flocks of *Gallus gallus*, laying hens, broilers and breeding and fattening turkeys. For the national report, the German federal states forward the results of their investigations to the responsible federal authorities for evaluation since 2007. This data is used to compile the annual report on the control program by the German Federal Institute for Risk Assessment (BfR).

Evaluation of the data for 2017 shows a comparable or slightly declining occurrence (prevalence) of *Salmonella* for all animal species and production types (breeding chickens, laying hens, broilers, breeding turkeys and turkeys) considered in the report, compared to the previous year. With regard to the types of *Salmonella* (serovars) of relevance for control purposes, the targets were achieved for all poultry groups considered, except for breeding turkeys. According to the requirements of community law, *Salmonella* serovars relevant for control should be detectable in a maximum of 1% or 2% (laying hens) of the flocks examined.

1 Legal basis for reporting

Article 9 (1) of Directive 2003/99/EC provides that the data on the assessment of national control programmes according to Regulation (EC) No. 2160/2003 is published annually in the report on trends and sources of zoonoses, zoonotic agents and antibiotic resistance.

2 Results

In the summarising evaluations, each flock is only shown once, even if it has been checked ("sampled") several times in accordance with the specifications. The flocks examined overall, *Salmonella*-positive flocks and the proportion of positive flocks are listed in the tables of the examined animal species and production types, both in total and separately for the different examination reasons.

2.1 Salmonella control programme in breeding poultry (*Gallus gallus*)

According to Regulation (EU) No. 200/2010, a total of 810 flocks of breeding chickens were examined for all examination reasons (at the instigation of the food business operator and/or as part of official control) during the laying phase (Table 1). The detection rates for *Salmonella* spp. (sum of all serovars) and for the five control-relevant serovars (Top 5¹) from 2007 to 2017 are summarised in Figure 1.

Salmonella was detected in 18 flocks (2.2%) in 2017 (Table 1). One of the five control-relevant serovars was found in six positive flocks (0.7%) (in 2016: four flocks, 0.5%). This is related to detection of *S. Enteritidis* in three flocks, *S. Typhimurium* in two flocks and *S. Infantis* in one flock. *S. Typhimurium* and *S. Infantis* were detected in the previous year. The serovars *S. Hadar* and *S. Virchow* were not discovered in 2017, as in previous years. In

¹ Top 5: *S. Enteritidis*, *S. Typhimurium* (including the monophasic variant), *S. Infantis*, *S. Hadar*, *S. Virchow*

2016, the proportion of flocks of breeding chickens with evidence of *Salmonella* was 1.3%. In 2017, there was no continuing downward trend, but the *Salmonella* detection rate was comparable to the 2016 value.

Table 1: Examination of breeding poultry (*Gallus gallus*) according to Regulation (EU) No. 200/2010 in 2017

	Number of flocks examined	<i>Salmonella</i>		S. Enteritidis		S. Typhimurium		Top 5*	
		positive	%	positive	%	positive	%	positive	%
All breeds, total									
Sampling (total)	810	18	2.2	3	0.4	2	0.2	6	0.7
Of which: Sampling instigated by food business operator	810	18	2.2	3	0.4	2	0.2	6	0.7
Of which: Sampling in connection with official control	789	3	0.4	3	0.4	0	0	3	0.4
Of which parent-breeders of egg-production line									
Sampling (total)	215	0	0	0	0	0	0	0	0
Of which: Sampling instigated by food business operator	215	0	0	0	0	0	0	0	0
Of which: Sampling in connection with official control	212	0	0	0	0	0	0	0	0
Of which parent-breeders of meat-production line									
Sampling (total)	385	18	4.7	3	0.8	2	0.5	6	1.6
Of which: Sampling instigated by food business operator	385	18	4.7	3	0.8	2	0.5	6	1.6
Of which: Sampling in connection with official control	374	3	0.8	3	0.8	0	0	3	0.8

* S. Enteritidis, S. Typhimurium incl. monophasic variant, S. Hadar, S. Infantis and S. Virchow

A total of 789 flocks of breeding chickens were examined as part of official monitoring (in 2016: 851). *Salmonella* was detected in three flocks (0.4%) in 2017 (Table 1). This constitutes a decrease compared to the previous year (in 2016: seven flocks, 0.8%). In a total of three flocks (0.4%; in 2016: four flocks, 0.5%), control-relevant serovars were found during the official investigation. In all cases it was S. Enteritidis.

In 2017, a total of 8 great-grandparent and 202 grandparent flocks were examined. *Salmonella* was not detected in any of these flocks. In the previous year, no *Salmonella* was found in any grandparent flocks either. In contrast, three flocks tested positive for S. Enteritidis in 2015, one flock for S. Enteritidis in 2014 and two flocks for S. Typhimurium in 2013. In 2012 and 2011, no *Salmonella* was found at these production levels.

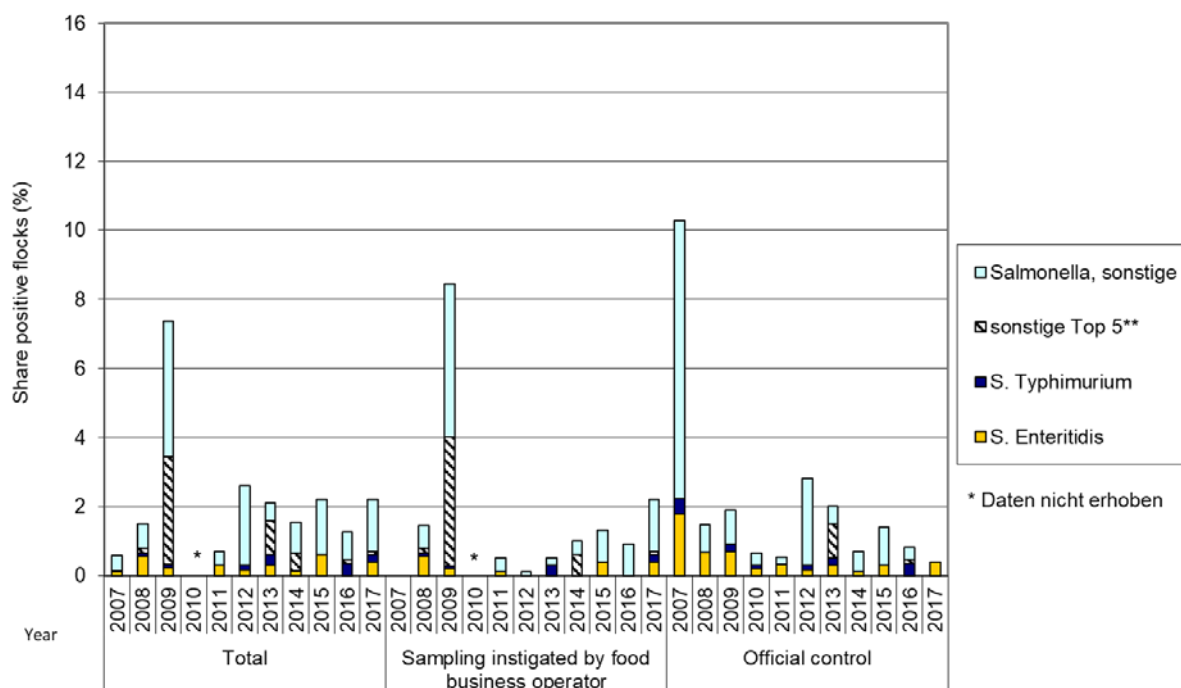
More precise classification with regard to the production type (egg production, meat production) was made for all parent flocks (Table 1). *Salmonella* was not detected in any of the 215 parent flocks of egg production line (layers breeders). *Salmonella* was found in 18 of the 385 parent flocks of broilers (4.7%, broiler breeders). Control-relevant serovars were detected in

six parent flocks of broiler breeders (1.6%). *S. Enteritidis* was found in three flocks, *S. Typhimurium* in two flocks and *S. Infantis* in one flock.

In 2016, two layer breeder flocks and nine flocks of broiler breeders were found to contain *Salmonella*. In contrast to 2017, only *S. Typhimurium* and *S. Infantis* were identified in 2016 and not the serovar *S. Enteritidis*. The downward trend observed in parent flocks of laying animals in 2016 continued in 2017. With a detection rate of 4.7%, *Salmonella* prevalence in broiler breeders was significantly higher than in previous years (in 2016: 2.1%, in 2015: 1.6%, in 2014: 1.9%).

The positive findings in the parent flocks of the egg production or meat production line were made within official investigations and/or by investigations instigated by the food business operators.

Figure 1. Proportion of flocks of breeding poultry (*Gallus gallus*) from 2007 to 2017, in which *Salmonella* was detected, separated by examination reason and year (** other Top 5 = *S. Hadar*, *S. Infantis*, *S. Virchow*)



Within the examination of breeding poultry (*Gallus gallus*) during rearing, results were reported for a total of 289 flocks. Most of the samples were taken at the food business operators' instigation. In 2017, *Salmonella* was found in five flocks. Two flocks contained *S. Typhimurium* and one flock *S. Infantis*. In previous years, no parent flocks were reported as being *Salmonella*-positive during the rearing phase.

2.2 *Salmonella* control programme for laying hens

A total of 5,715 flocks were examined in 2017 according to Regulation (EU) No. 517/2011. *Salmonella* was detected in 105 flocks (1.8%) (Table 2). This corresponded to the previous year's value (2016: 1.8%) and was lower than in 2015 (2.2%) and in 2013 (2.0%), but higher than in 2014 (1.4%) and in 2012 (1.6%). In 56 flocks of laying hen (1.0%) (in 2016: 72 flocks, 1.3%; in 2015: 70 flocks, 1.2%), *S. Enteritidis* or *S. Typhimurium* were found during the laying phase. *S. Enteritidis* was found in 37 flocks (0.5%; in 2016: 1.0%) and *S. Typhimurium* in 31 (0.5%; in 2016: 0.3%) of the flocks examined. It becomes clear that detection of *S. Enteritidis* has decreased but prevalence of *S. Typhimurium* has increased.

In 2017, *Salmonella* spp. was identified in the laying phase in 66 of the 2,856 laying hen flocks (2.3%) by **official monitoring**. *S. Enteritidis* or *S. Typhimurium* were found in 45 flocks (1.6%). *S. Enteritidis* was isolated in 26 flocks (0.9%) and *S. Typhimurium* in 19 flocks (0.7%). In 2016, as part of official monitoring, *Salmonella* spp. was identified in 2.2% of laying hen flocks and *S. Enteritidis* or *S. Typhimurium* were found in 1.8% of the flocks. As a result, the detection rate of the two control-relevant serovars within the scope of official monitoring shows a slight decrease compared to the previous year, however the 2014 level was not reached again (1.4%).

The detection rates for laying hen flocks during the laying phase from 2008 to 2017 for *Salmonella* spp. (sum of all serovars), as well as for the serovars *S. Enteritidis* and *S. Typhimurium* are summarised in Figure 2 according to the different examination reasons.

Table 2: Examination of laying hens (*Gallus gallus*) according to Regulation (EU) No. 517/2011 in 2017

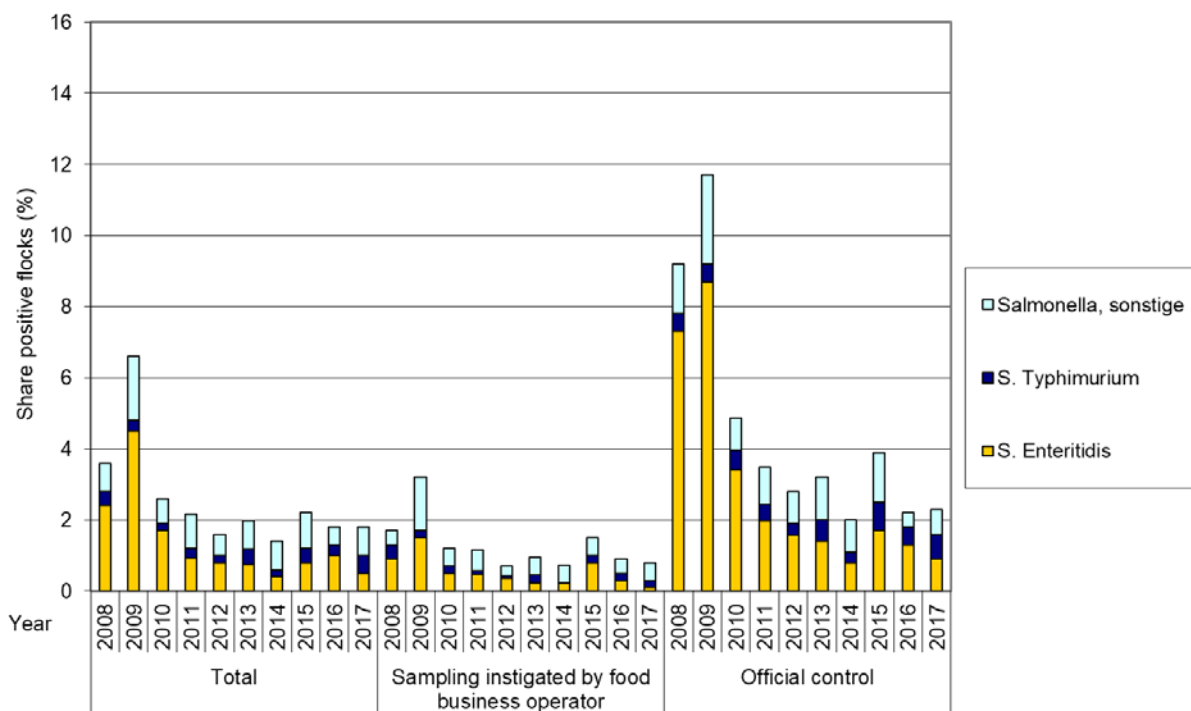
	Number examined Flocks	<i>Salmonella</i>		<i>S. Enteritidis</i>		<i>S. Typhimurium</i>		<i>S. Enteritidis / S. Typhimurium</i>	
		positive	%	positive	%	positive	%	positive	%
Sampling (total)	5715	105	1.8	27	0.5	31	0.5	56	1.0
Of which: Sampling instigated by food business operator	5610	45	0.8	3	0.05	13	0.2	16	0.3
Of which: Sampling in connection with official monitoring	2856	66	2.3	26	0.9	19	0.7	45	1.6
Of which: Sampling in connection with official control	2752	44	1.6	17	0.6	11	0.4	28	1.0
Of which: Suspected cases and follow-up investigations in connection with official control	104	22	21.2	9	8.7	8	7.7	17	16.3

In 2017, official investigations were performed in 104 instances of suspected cases or follow-up investigations. *Salmonella* spp. was identified in 22 of these flocks (Table 2).

When laying hens were examined during rearing, detection of *Salmonella* was reported in nine of the total of 654 flocks examined (1.4%). Five flocks demonstrated *S. Enteritidis* and

four flocks *S. Typhimurium*. No positive detection was reported in 2016, this rate was 1.2% in 2015. As was observed in previous years, the instances of detection in 2015 did not concern control-relevant serovars. Therefore, a clear negative trend can be observed in laying hen rearing in 2017.

Figure 2. Proportion of laying hen flocks during the laying phase from 2008 to 2017, in which *Salmonella* was detected according to examination reason and year



2.3 *Salmonella* control programme in broilers

A total of 24,088 flocks were examined. *Salmonella* was detected in 500 flocks (2.1%) (Table 3). In 2016, 2.4% of the flocks examined were positive for *Salmonella* spp.

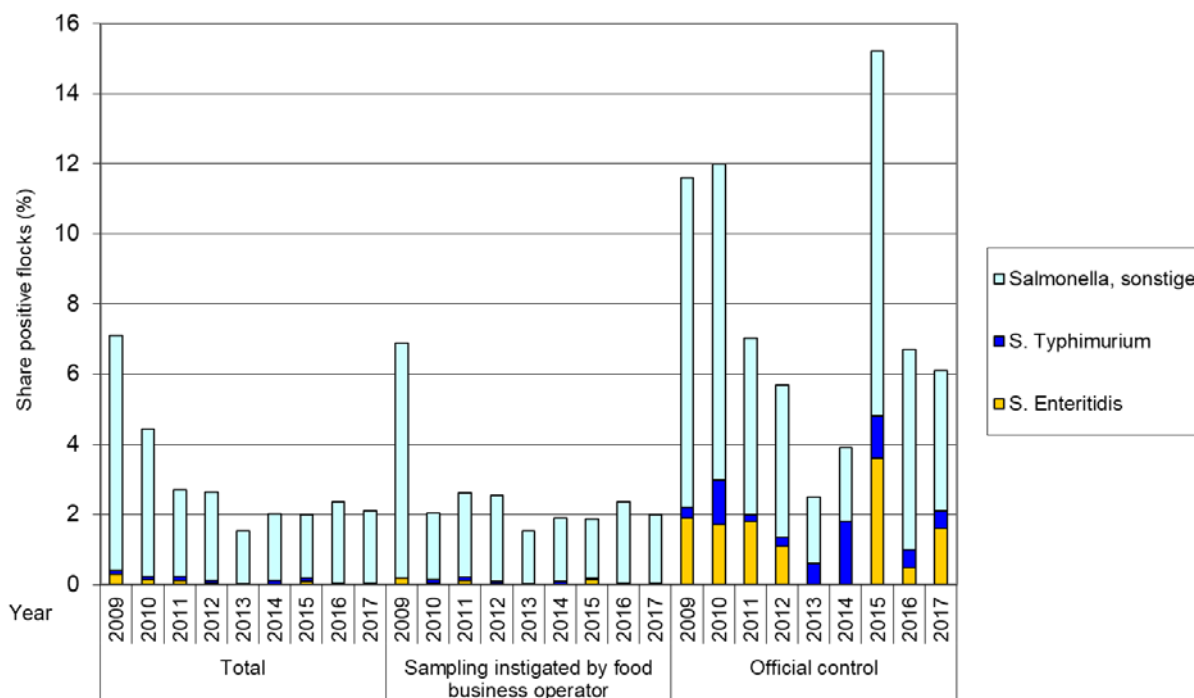
S. Enteritidis or *S. Typhimurium* were found in 11 flocks in 2017 (0.05%) (in 2016: 12 flocks, 0.1%) detected. *S. Enteritidis* was identified in seven flocks (0.03%) and *S. Typhimurium* in four flocks (0.02%). In 2016, however, *S. Typhimurium* (ten flocks, 0.04%) and *S. Enteritidis* (two flocks, 0.01%) were detected more frequently (Figure 3).

If one considers the detection rates in the context of the internal controls and the official examination separately, in each case the *Salmonella* detection rate was on a similar level as in the previous year. The difference between the detection rates in the official investigation compared to the internal controls was also observed in 2017 (Figure 3).

Table 3: Examination of broiler flocks (*Gallus gallus*) according to Regulation (EU) No. 200/2012 in 2017

	Number examined Flocks	<i>Salmonella</i>		S. Enteritidis		S. Typhimurium		S. Enteritidis / S. Typhimurium	
		positive	%	positive	%	positive	%	positive	%
Sampling (total)	24088	500	2.1	7	0.03	4	0.02	11	0.05
Of which: Sampling instigated by food business operator	24088	487	2.0	7	0.03	3	0.01	10	0.04
Of which: Sampling in connection with official control	378	23	6.1	6	1.6	2	0.5	8	2.1

Figure 3. Proportion of broiler flocks from 2009 to 2017, in which *Salmonella* was detected according to examination reason and year

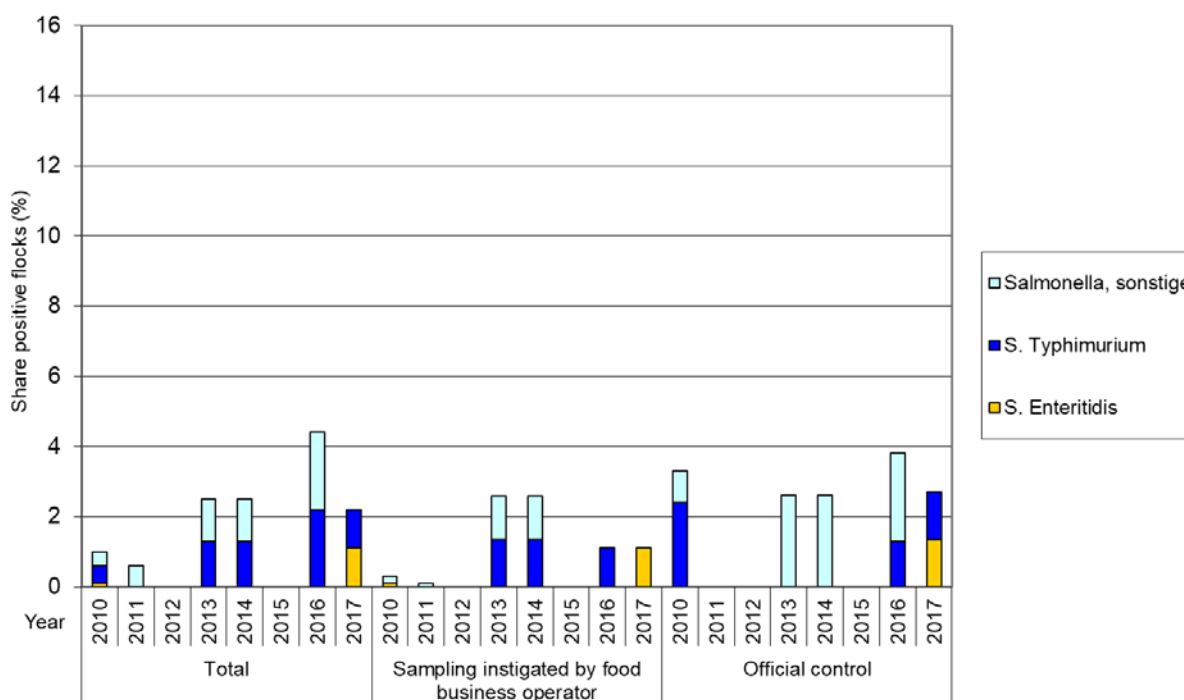


2.4 *Salmonella* control programme in breeding turkeys

In total, examinations of 90 turkey breeding flocks were reported. Of these flocks, two flocks (2.2%) were positive for *Salmonella* in 2017. *S. Enteritidis* and *S. Typhimurium* were detected in one flock each. One of the flocks was identified during investigations by the food business operators, and another as part of the official control. Four positive flocks (4.4%) were reported in 2016, two of them positive for *S. Typhimurium* (2.2%). No positive flock was detected in 2015 and a few positive flocks had been observed in previous years (Figure 4).

Salmonella was found in one of the 32 flocks examined during the rearing period. It was *S. Enteritidis*. Detection of *Salmonella* was last reported in this group of animals in 2013, and was a serovar not subject to control.

Figure 4. Proportion of turkey breeding flocks from 2010 to 2017 in which *Salmonella* was detected according to examination reason and year



2.5 *Salmonella* control programme for turkeys

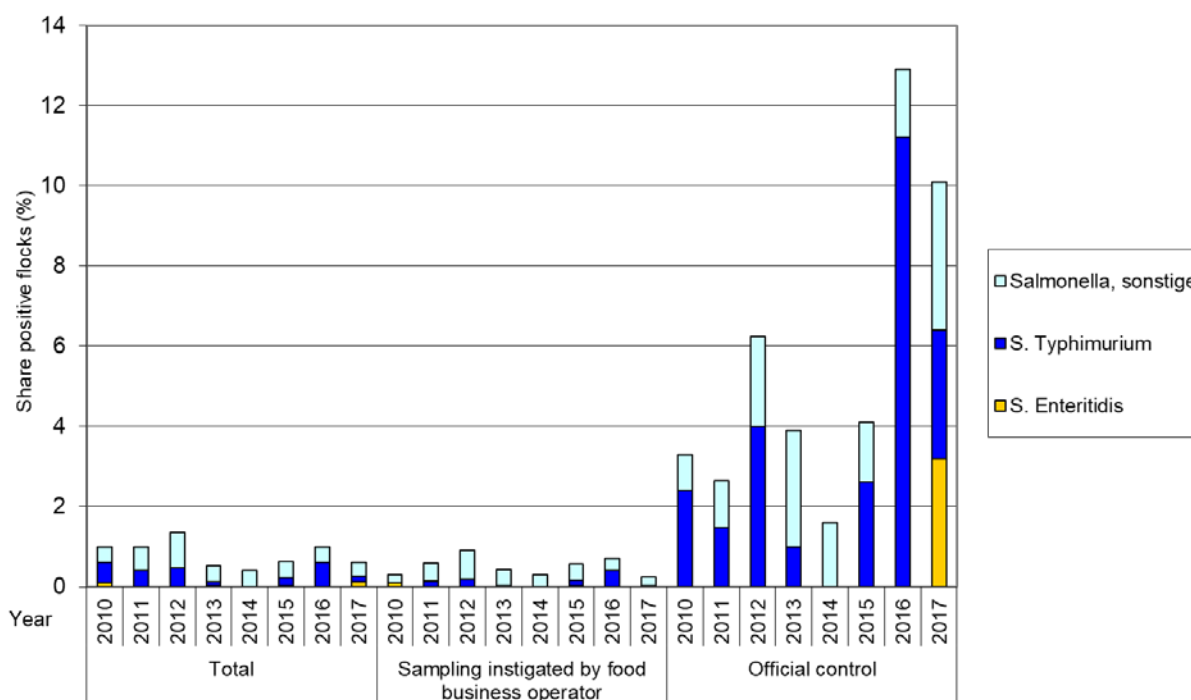
A total of 4,681 turkey fattening flocks were examined in accordance with Regulation (EU) No. 1190/2012 (Table 4). Of these flocks, 27 (0.6%) were positive for *Salmonella* spp. In 2017, *S. Typhimurium* (6 flocks, 0.1%) and *S. Enteritidis* (6 flocks, 0.1%) were both detected. In the previous year, 1.0% of turkey flocks examined had been positive. Of control-relevant serovars, only *S. Typhimurium* was detected in 2016, but not *S. Enteritidis* (Figure 5).

Table 4: Examination of turkey flocks according to Regulation (EU) No. 1190/2012 in 2017

	Number examined Flocks	<i>Salmonella</i>		<i>S. Enteritidis</i>		<i>S. Typhimurium</i>		<i>S. Enteritidis / S. Typhimurium</i>	
		posi- tive	%	posi- tive	%	posi- tive	%	posi- tive	%
Sampling (total)	4681	27	0.6	6	0.1	6	0.1	12	0.3
Of which: Sampling instigated by food business operator	4681	11	0.2	1	0.02	0	0	1	0.02
Of which: Sampling in connection with official control	188	19	10.1	6	3.2	6	3.2	12	6.4

A high proportion of positive flocks (10.1%) was still reported in the official investigations, albeit less than in 2016 (12.9%). Compared to previous years (4.1% in 2015; 1.6% in 2014; 3.9% in 2013), the detection rate in 2016 and 2017 was elevated significantly

Figure 5. Proportion of turkey flocks from 2010 to 2017 in which *Salmonella* was detected according to examination reason and year



3 Summary

The results forwarded by the federal states as part of the control programmes according to Regulation (EC) No. 2160/2003 were summarised for reporting at the federal level. For 2017, they document a comparable or slightly decreasing prevalence of *Salmonella* for all animal species and production types considered compared to the previous year. With regard to the control-relevant serovars, the community target value was reached for all poultry groups included in the control programmes, except for breeding turkeys. For breeding chickens, broilers and turkeys, a prevalence of less than 1% for the control-relevant serovars was achieved, for laying hens the prevalence of 1.0% was below the target value of 2%. A control-relevant serovar was detected in 2.2% of the turkey breeding flocks and the community target was again exceeded.

In 2017, *S. Enteritidis* was reported again across all animal species and production types. Therefore, the trend of mainly detecting *S. Typhimurium* did not continue. *S. Infantis* was detected in one flock of breeding chickens in the rearing and laying phase each, no significant spread of this serovar was observed in breeding chickens. In the other production groups, this serovar is not one of the control-relevant serovars.

Salmonella was detected in 2.2% of flocks of breeding chickens in 2017, 0.7% of the flocks tested positive for a control-relevant serovar. The results therefore constitute a similar level as in the previous year.

There was no decline in *Salmonella* prevalence in flocks of laying hens in 2017. After an increase in the detection of *S. Enteritidis* in the laying phase had been reported in the past two years, the detection rate for this serovar decreased again in 2017. A slight increase was observed for *S. Typhimurium*.

A slight decline in the prevalence of *Salmonella* and detection of the control-relevant serovars *S. Enteritidis* and *S. Typhimurium* was again observed in broilers in 2017. As in previous years, in broilers the non-control-relevant serovars dominated in all investigations. Again, the high detection rate in official control is striking, which may be due to the risk-based selection of the sampled flocks.

As in most previous years, *Salmonella* was found in breeding turkeys in 2017. Since a control-relevant serovar was isolated in two out of 90 flocks, the community target value of 1% or at most one positive finding could not be achieved again in 2017.

The observed *Salmonella* prevalence (0.6%) in turkey flocks declined again somewhat in 2017 after rising to 1.0% in the previous year. However, detection of *S. Typhimurium* and *S. Enteritidis* has been reported. In contrast, *S. Enteritidis* was not observed in the previous year.

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