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Salmonella control programme – results for 2018: No uniform trend for poultry

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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 poultry (*Gallus gallus*), laying hens, broilers and breeding and fattening turkeys. For the national report, the German federal states have forwarded 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 2018 shows no uniform trend for occurrence (prevalence) of *Salmonella* for all animal species and production types (breeding hen flocks, laying hens, broilers, breeding turkeys and turkeys) considered in the report, compared to the previous year. Regarding the control-relevant *Salmonella* types (serovars), the control objectives were achieved for all poultry groups considered. According to the requirements in Community law, control-relevant *Salmonella* serovars should be detected in a maximum of 1% or 2% (laying hens) of the flocks examined or a maximum of one flock if less than 100 flocks were examined.

1 Legal foundation 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 pathogens and antimicrobial 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 767 breeding hen flocks were examined in total 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 2018 are summarised in Figure 1.

Salmonella was detected in five flocks (0.7 %) in 2018 (Table 1). One of the five control-relevant serovars was found in two positive flocks (0.3 %) (year 2017: six flocks, 0.7 %). *S. Enteritidis* was detected in both flocks. In the previous year, *S. Typhimurium* and *S. Infantis* were also detected. The serovars *S. Hadar* and *S. Virchow* were not discovered in 2018, as

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

in previous years. In 2017, the proportion of breeding hen flocks with evidence of *Salmonella* was 2.2 %. In 2018, the low level of previous years was reached again.

Table 1: Examination of breeding poultry (*Gallus gallus*) according to Regulation (EU) No. 200/2010 in 2018

	Number of flocks examined	<i>Salmonella</i>		<i>S. Enteritidis</i>		<i>S. Typhimurium</i>		Top 5*	
		positive	%	positive	%	positive	%	positive	%
All breeds, total									
Sampling (total)	767	5	0.7	2	0.3	0	0	2	0.3
Of which: Sampling instigated by food business operator	767	4	0.5	2	0.3	0	0	2	0.3
Of which: Sampling in connection with official control	742	3	0.4	2	0.3	0	0	2	0.3
Of which laying hen parent-breeding									
Sampling (total)	211	1	0.5	0	0	0	0	0	0
Of which: Sampling instigated by food business operator	211	0	0	0	0	0	0	0	0
Of which: Sampling in connection with official control	211	1	0.5	0	0	0	0	0	0
Of which broiler parent-breeding									
Sampling (total)	370	4	1.1	2	0.5	0	0	2	0.5
Of which: Sampling instigated by food business operator	370	4	1.1	2	0.5	0	0	2	0.5
Of which: Sampling in connection with official control	352	2	0.6	2	0.6	0	0	2	0.6

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

A total of 742 breeding hen flocks were examined as part of official control (in 2017: 789). *Salmonella* was detected in three flocks (0.4 %) in 2018 (Table 1). This constitutes zero change compared to the previous year (in 2017: three flocks, 0.4 %). Control-relevant serovars were discovered during the official investigation in a total of two flocks (0.3 %; year 2018: three flocks, 0.4 %). In both cases it was *S. Enteritidis*.

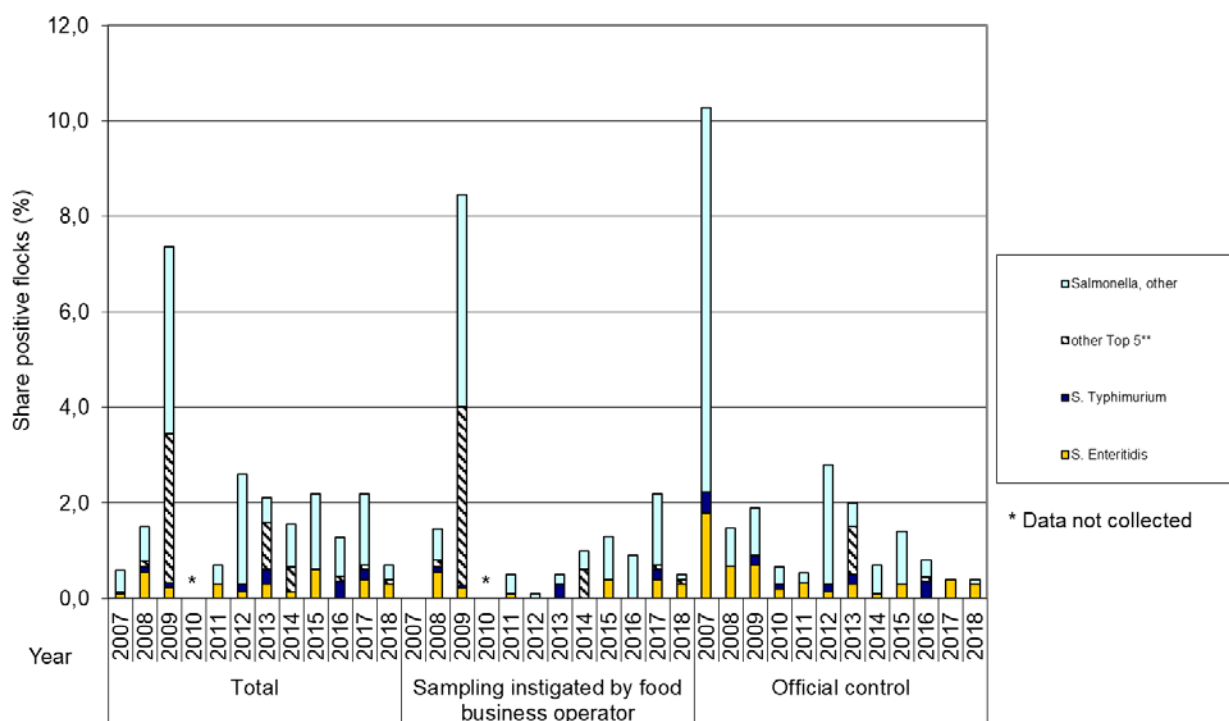
A total of 7 great-grandparent and 179 grandparent flocks were examined in 2018. *Salmonella* was not detected in any of these flocks. Likewise, in 2016 and 2017 no great-grandparents and grandparent flocks were found to have *Salmonella*. In contrast, three flocks tested positive for *S. Enteritidis* 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 line, meat production line) was made for all parent flocks (Table 1). *Salmonella* was found in one of the 211 parent flocks of laying hen breeders (0.5 %, laying hen breeders); however, it was not a control-relevant serovar. *Salmonella* was found in 4 of the 370 parent flocks of broiler breeders (1.1 %, broiler breeders). Control-relevant serovars were detected in two parent flocks of broiler breeders (0.5%). *S. Enteritidis* was found in both flocks.

In 2017, control-relevant *Salmonella* was detected in zero parent flocks of laying hen breeders and in six flocks of broiler breeders. In contrast to 2018, *S. Typhimurium* and *S. Infantis* were identified in 2017 as well as *S. Enteritidis*. The favourable situation observed in parent flocks of laying hen breeders in 2017 did not continue in 2018. With a detection rate of 1.1 %, the 2018 *Salmonella* prevalence in broiler breeders was significantly lower than in previous years (in 2017: 4.7 %, in 2016: 2.1%, in 2015: 1.6 %, in 2014: 1.9 %).

The positive findings in the parent flocks of laying hen breeders or broiler breeders were made by official control and/or by investigations instigated by the operator.

Figure 1. Proportion of flocks of breeding poultry (*Gallus gallus*) from 2007 to 2018, 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 256 flocks examined. Most of the samples were taken at the operators' instigation. *Salmonella* was not detected in any flocks in 2018. In 2017, *Salmonella* had been detected in a total of five flocks, two of which were *S. Typhimurium* and one of which was *S. Infantis*. In previous years, no parent flocks had been reported as being *Salmonella*-positive during the rearing phase.

2.2 *Salmonella* control programme for laying hens

A total of 6,039 flocks were examined in accordance with Regulation (EU) No. 517/2011 in 2018. *Salmonella* was detected in 87 flocks (1.4 %) (Table 2). This corresponded to a reduction over the previous year's value (2017: 1.8 %). In 73 flocks of laying hens (1.2 %) (in 2017: 56 flocks, 1.0 %; in 2016: 72 flocks, 1.3 %), *S. Enteritidis* or *S. Typhimurium* were found during the laying phase. *S. Enteritidis* was found in 42 (0.7%; 2017: 0.5%) and *S. Typhimurium* in 31 (0.5%; 2017: 0.5%) flocks examined. It's clear that detection of *S. Enteritidis* has increased and that *S. Typhimurium* has remained at the same level. In total, a downward trend was achieved for *Salmonella* in 2018, but not for the control-relevant serovars.

As part of **official control**, *Salmonella* spp. was detected in 72 of the 3,084 flocks of laying hens (2.3%) in the laying phase. *S. Enteritidis* or *S. Typhimurium* were found in 63 flocks (2.0 %). *S. Enteritidis* was isolated in 38 flocks (1.2%) and *S. Typhimurium* in 25 flocks (0.8%). In 2017, as part of official control, *Salmonella* spp. had been identified in 2.3 % of laying hen flocks and *S. Enteritidis* or *S. Typhimurium* had been found in 1.6 % of the flocks. As a result, the detection rate of the two control-relevant serovars has increased slightly within official control compared to the previous year. The *Salmonella* detection rate was in the range of the previous year.

The detection rates for laying hen flocks during the laying phase from 2008 to 2018 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 2018

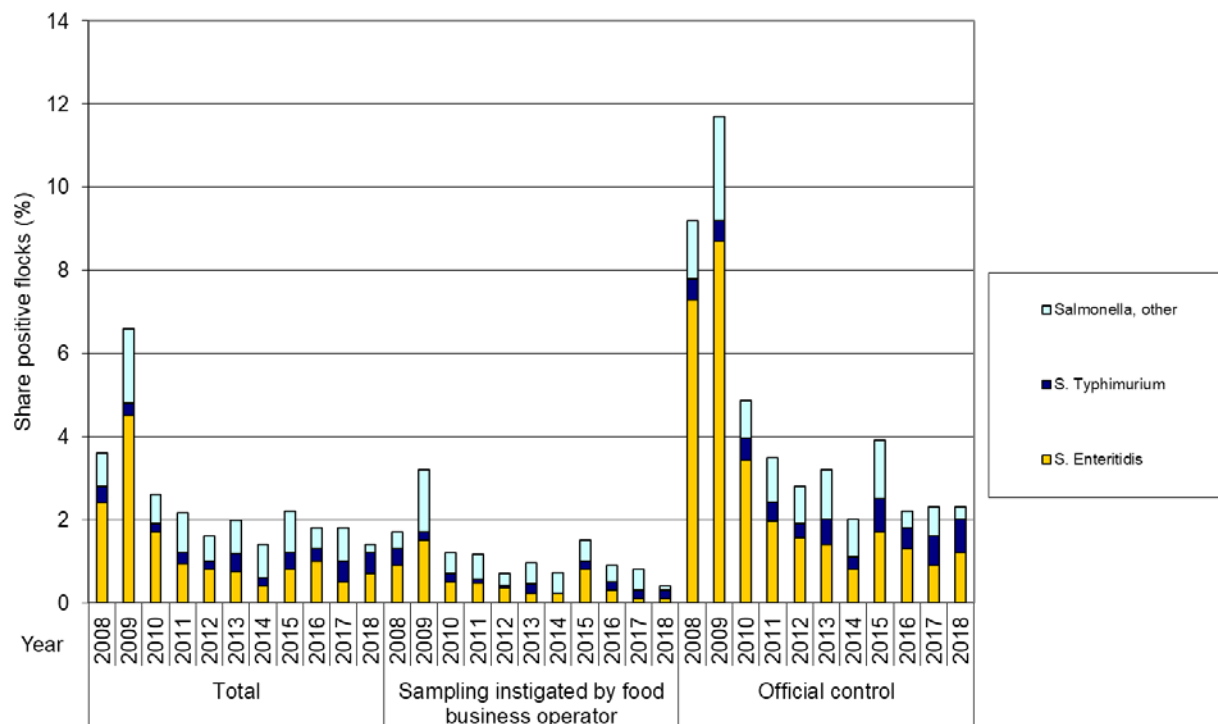
	Number examined Flocks	<i>Salmonella</i>		<i>S. Enteritidis</i>		<i>S. Typhimurium</i>		<i>S. Enteritidis / S. Typhimurium</i>	
		positive	%	positive	%	positive	%	positive	%
Sampling (total)	6039	87	1.4	42	0.7	31	0.5	73	1.2
Of which: Sampling instigated by food business operator	5863	24	0.4	8	0.1	10	0.2	18	0.3
Of which: Sampling in connection with official control	3084	72	2.3	38	1.2	25	0.8	63	2.0
Of which: Sampling in connection with official control	2915	37	1.3	19	0.7	12	0.4	31	1.1
Of which: Suspected cases and follow-up investigations in connection with official control	169	35	20.7	19	11.2	13	7.7	32	18.9

In 2018, official investigations were performed in 169 instances of suspected cases or follow-up investigations. *Salmonella* spp. was identified in 35 of these flocks (Table 2).

When laying hens were examined during rearing, detection of *Salmonella* was reported in two of the total of 662 flocks examined (0.2 %). It was *S. Enteritidis*. Nine positive detections

(1.4%) had been reported for 2017, both *S. Enteritidis* and *S. Typhimurium*. As a result, the increase observed within laying hen rearing in 2017 did not continue.

Figure 2. Proportion of laying hen flocks during the laying phase from 2008 to 2018, in which *Salmonella* was detected according to examination reason and year



2.3 *Salmonella* control programme in broilers

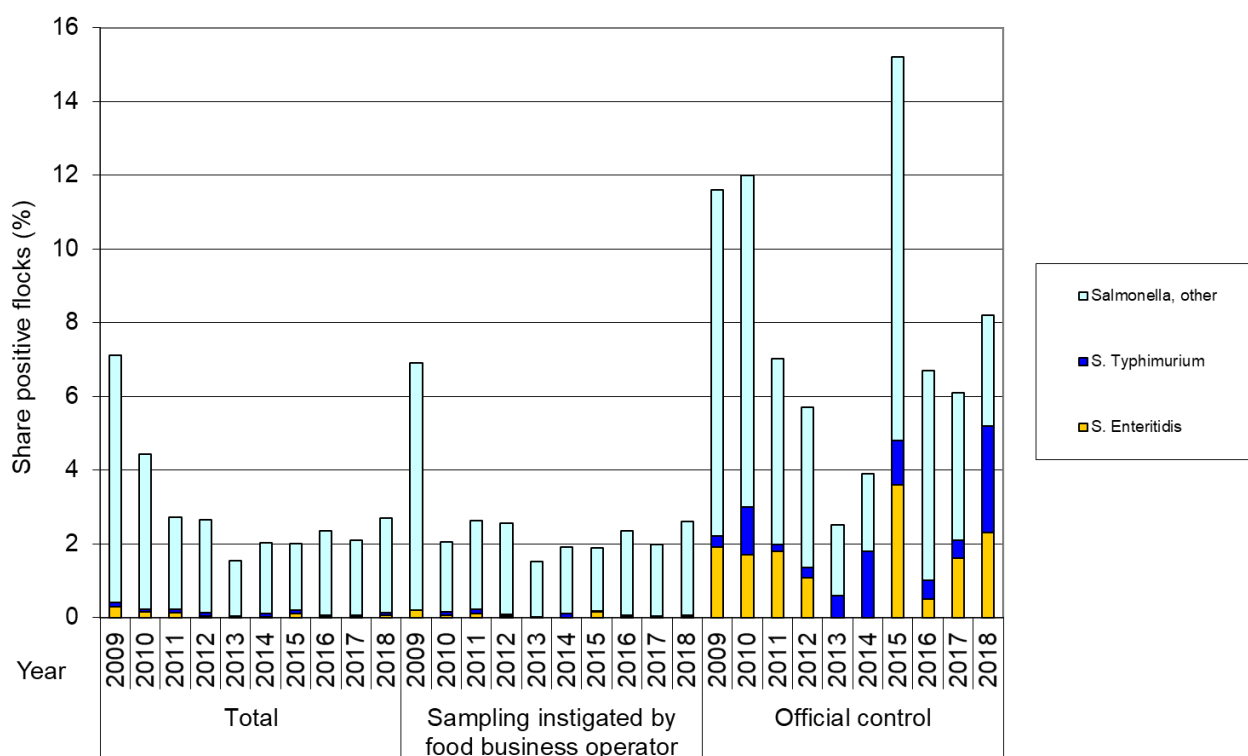
A total of 21,277 flocks were examined. *Salmonella* was detected in 578 flocks (2.7 %) (Table 3). In 2017, 2.1 % of the flocks examined tested positive for *Salmonella* spp. Control-relevant serovars *S. Enteritidis* or *S. Typhimurium* were detected in 27 flocks (0.13 %) in 2018 (year 2017: 11 flocks, 0.05%). 14 flocks (0.07 %) exhibited *S. Enteritidis* and nine flocks (0.06 %) *S. Typhimurium*. *S. Enteritidis* (7 flocks, 0.03 %) and *S. Typhimurium* (4 flocks, 0.02 %) were also detected in 2017 (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 higher 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 2018 (Figure 3).

Table 3: Examination of broilers (*Gallus gallus*) according to Regulation (EU) No. 200/2012 in 2018

	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)	21277	578	2.7	14	0.07	13	0.06	27	0.13
Of which: Sampling instigated by food business operator	21265	557	2.6	9	0.04	5	0.02	14	0.07
Of which: Sampling in connection with official control	341	28	8.2	8	2.3	10	2.9	18	5.3

Figure 3. Proportion of broiler flocks from 2009 to 2018, in which *Salmonella* was detected according to examination reason and year



2.4 *Salmonella* control programme in breeding turkeys

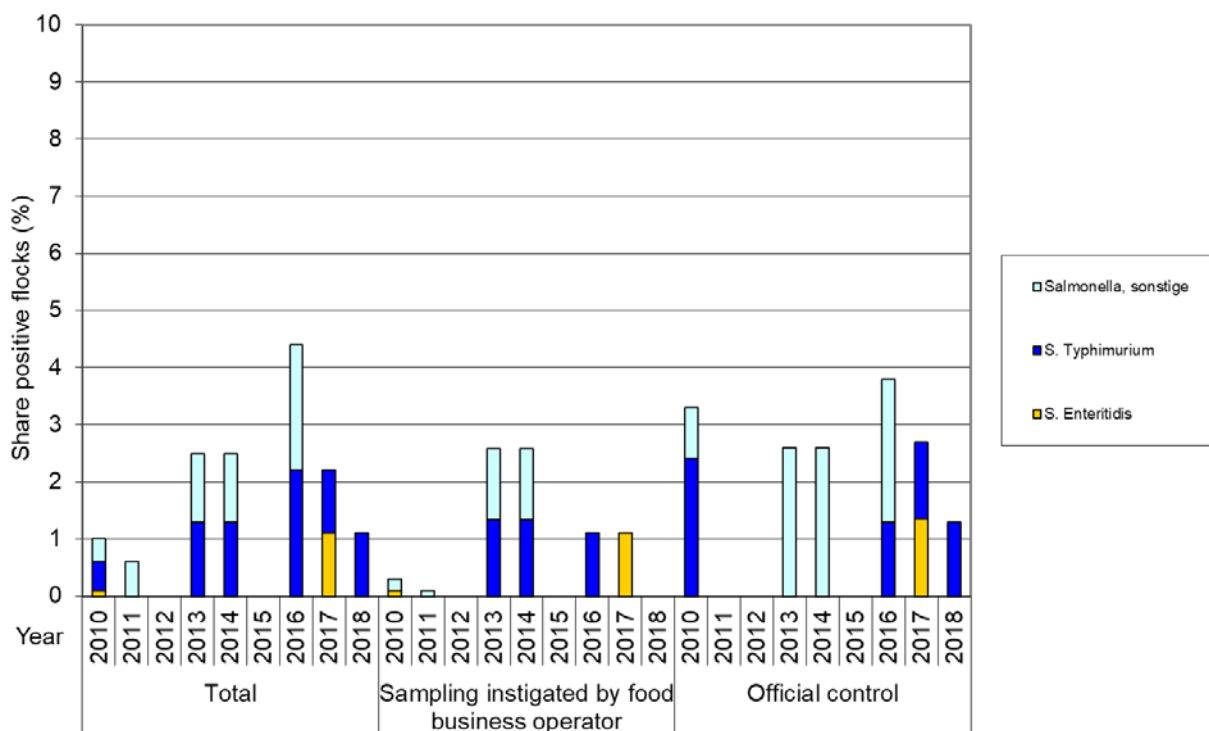
In total, examinations of 92 breeding turkey flocks were reported. Of these flocks, one flock (1.1 %) was positive for *Salmonella* in 2018 (Table 4). *S. Typhimurium* was found in this flock. The positive flock was identified in the course of official control. Two positive flocks (2.2%) were reported in 2017, one of them for *S. Enteritidis* and one for *S. Typhimurium* (Figure 4).

Table 4: Examination of turkey breeding flocks according to Regulation (EC) No. 1190/2012 in 2018

	Number examined Flocks	Salmonella		S. Enteritidis		S. Typhimurium		S. Enteritidis / S. Typhimurium	
		positive	%	positive	%	positive	%	positive	%
Sampling (total)	92	1	1.1	0	0	1	1.1	1	1.1
Of which: Sampling instigated by food business operator	92	0	0	0	0	0	0	0	0
Of which: Sampling in connection with official control	76	1	1.3	0	0	1	1.3	1	1.3

Salmonella was found in one of the 49 flocks examined during the rearing period. No control-relevant serovars were detected. *S. Enteritidis* was reported in one flock in 2017. Detection of *Salmonella* was last reported in this group of animals in 2013, and that had not been a control-relevant serovar.

Figure 4. Proportion of breeding turkey flocks from 2010 to 2018 in which *Salmonella* was detected according to examination reason and year



2.5 *Salmonella* control programme for fattening turkeys

A total of 4,643 fattening turkey flocks were examined in accordance with Regulation (EU) No. 1190/2012 (Table 5). Of these flocks, 33 (0.7 %) were positive for *Salmonella* spp. In 2018, *S. Typhimurium* (16 flocks, 0.3 %) and *S. Enteritidis* (one flock, 0.02 %) were both de-

tected. In the previous year, 0.6 % of fattening turkey flocks examined had tested positive for *Salmonella*. Of the control-relevant serovars, only *S. Typhimurium* and *S. Enteritidis* had been detected in 2017 (Figure 5).

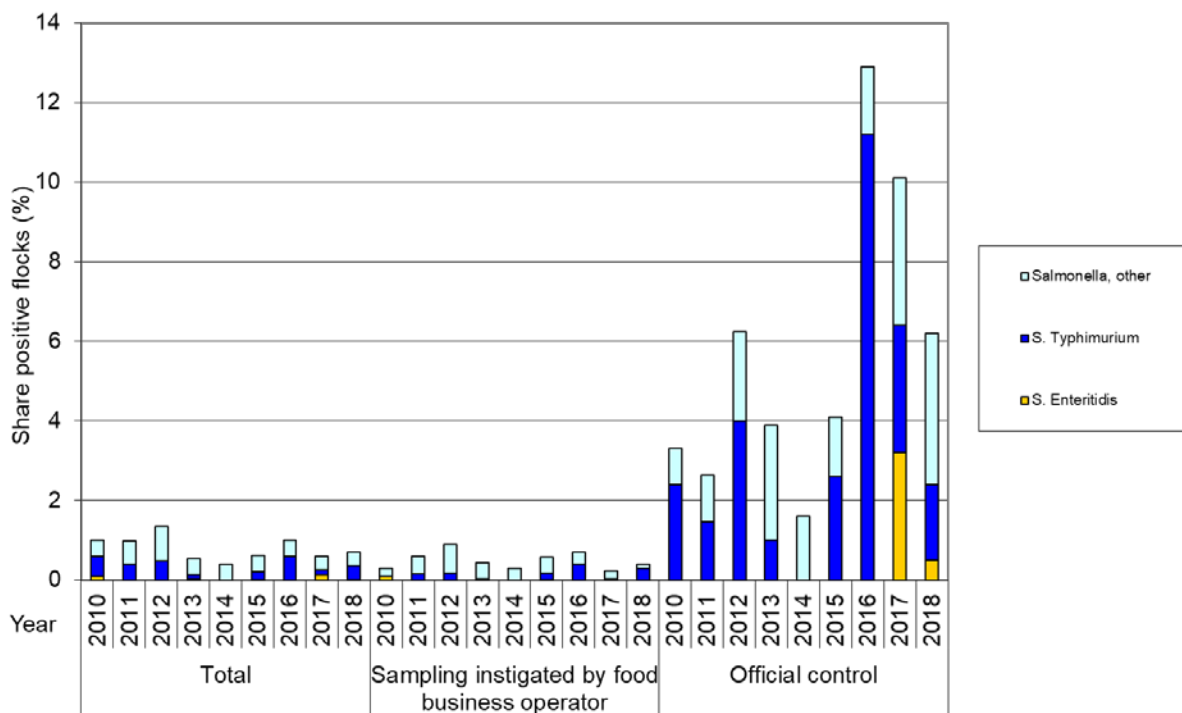
Table 5: Examination of fattening turkeys according to Regulation (EU) No. 1190/2012 in 2018

	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)	4643	33	0.7	1	0.02	16	0.3	17	0.4
Of which: Sampling instigated by food business operator	4618	20	0.4	0	0	12	0.3	12	0.3
Of which: Sampling in connection with official control	210	13	6.2	1	0.5	4	1.9	5	2.4

A high proportion of *Salmonella*-positive flocks (6.2 %) was still reported in the official control, albeit less than in 2017 (10.1%) and 2016 (12.9%). Compared to the period from 2013 to 2015 (4.1% in 2015; 1.6% in 2014; 3.9% in 2013), the 2018 detection rate was elevated and comparable to the situation in 2012.

The detection rates for *Salmonella* as a whole rose slightly in 2018, while the official detection rates decreased.

Figure 5. Proportion of fattening turkey flocks from 2010 to 2018 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 2018, they document a comparable or slightly altered prevalence of *Salmonella* for all animal species and production types considered compared to the previous year. In relation to the control-relevant serovars, the community target value was achieved for all poultry groups included in the control programs. For breeding hen flocks, broilers and fattening turkeys, a prevalence of less than 1% for the control-relevant serovars was achieved, for laying hens the prevalence of 1.2 % was below the target value of 2%. One control-relevant serovar was detected in one flock of breeding turkeys and therefore the community target was reached again.

S. Enteritidis and/or *S. Typhimurium* were reported across all animal species and production types in 2018. *S. Infantis* was only detected in broilers, but not in breeding hen flocks as in the previous year. In broilers, this serovar is not one of the control-relevant serovars.

Salmonella was detected in 0.7 % of breeding hen flocks in 2018, 0.3 % of the flocks tested positive for a control-relevant serovar. Therefore, the previous year's low level was reached again in 2018.

There was a decline in *Salmonella* prevalence in flocks of laying hens in 2018, but not for control-relevant serovars. A slight increase was observed for *S. Enteritidis* in 2018 after the detection rate had declined in 2017. No change was observed for *S. Typhimurium*.

An increasing trend in *Salmonella* prevalence and the detection of the control-relevant serovars *S. Enteritidis* and *S. Typhimurium* was observed in broilers in 2018. As in previous years, the non-control-relevant serovars dominated in broilers in all investigations. Again, the high detection rate in official investigations is striking, which may be due to the risk-oriented selection of the sampled flocks.

As in most previous years, *Salmonella* was found in one herd of breeding turkeys in 2018. Since a control-relevant serovar was isolated in one out of 92 flocks, the community target value of 1% or at most one positive find was achieved in 2018.

The observed *Salmonella* prevalence (0.7 %) in fattening turkey flocks increased slightly in 2018 after rising to 0.6 % in the previous year. Detection of *S. Typhimurium* and, in one flock, of *S. Enteritidis* was reported again. The serovar *S. Enteritidis* had rarely been seen in fattening turkeys before 2017.

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