

6 August 2024

***Salmonella* control programme – results for 2023: stable situation with low levels**

As part of the EU-wide programme to combat *Salmonella*, the member states are required to compile an annual report on the current situation. The report details the proportion of *Salmonella*-positive flocks in breeding poultry (*Gallus gallus*), laying hens, broilers and breeding and fattening turkeys. Particular focus is placed on the detection of selected serovars with particular relevance for human infection. The German federal states, responsible for monitoring and control measures, forward the results of their investigations to the responsible federal authorities for evaluation every year. This data is used to compile the annual report on the control programme by the German Federal Institute for Risk Assessment (BfR).

As seen in the previous year, evaluation of the data for 2023 shows evidence of an overall favourable situation. The prevalence of *Salmonella* for all animal species and production types considered in the report is low. Regarding the control-relevant *Salmonella* types (serovars), the control objectives were achieved for all poultry groups considered. 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 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 pathogen 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 937 breeding hen flocks 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 2023 are summarised in Figure 1.

Salmonella was detected in eight flocks (0.9 %) in 2023 (Table 1). One of the five control-relevant serovars was found in two positive flocks (0.2 %) (2022: 1 flock, 0.1 %). In these flocks, *S. Typhimurium* was detected in one flock and *S. Enteritidis* was detected in the other. *S. Typhimurium* was detected in one flock the previous year. The serovars *S. Hadar*, *S. Virchow*, and *S. Infantis* were not discovered, as in previous years. For 2022, the proportion of breeding hen flocks with positive detection of *Salmonella* was 0.8 %, a low level (0.9 % in 2023, 0.8 % in 2022, 4.8 % in 2021). The detection rate for the control-relevant serovars remained at a comparable level.

A total of 930 flocks of breeding hens were examined as part of **official control** (2022: 778). *Salmonella* was detected in seven flocks (0.8 %) in 2023 (Table 1). The detection rate has therefore again increased slightly compared to the previous year (2022: four flocks, 0.5 %). One control-relevant serovar was discovered during the official monitoring in two flocks (0.2 %; 2022: one flock, 0.1 %). It was *S. Enteritidis* and *S. Typhimurium* respectively, compared to *S. Enteritidis* in the one flock the previous year.

A total of five great-grandparent and 141 grandparent flocks were examined in 2023. *Salmonella* was not found in any great-grandparent or grandparent flock. *S. Typhimurium* was detected in one of the grandparent flocks in the previous year.

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 detected in three of the 57 parent flocks in the egg production line (laying hen-parent breeding 5.3 %) and in five of the 734 parent flocks in the meat production line (broiler-parent breeding 0.7 %). *S. Typhimurium* was found in one parent flock in the egg production line and *S. Enteritidis* was detected in one parent flock in the meat production line. In the previous year, none of the detections showed a control-relevant serovar.

In 2023, the situation for parent flocks in the egg production line developed in an unfavourable direction compared to the previous year, as *Salmonella* was detected in several flocks. In 2022, no *Salmonella* was detected in any parent flock of laying breeders.

In the parent flocks of broiler breeders, the *Salmonella* detection rate in 2023 (0.7 %) remained at the level of the previous year (0.7 %) and was lower compared to the value range of the previous years (2021: 6.5 %; 2020: 1.7 %).

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

Table 1: Examination of breeding poultry (*Gallus gallus*) according to Regulation (EU) No. 200/2010 in 2023

	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)	937	8	0.9	1	0.1	1	0.1	2	0.2
Of which: Sampling instigated by food business operator	937	3	0.3	1	0.1	0	0	1	0.1
Of which: Sampling in connection with official control	930	47	0.8	1	0.1	1	0.1	2	0.2
Of which laying hen parent-breeding									
Sampling (total)	57	3	5.3	0	0	1	1.8	1	1.8
Of which: Sampling instigated by food business operator	57	0	0	0	0	0	0	0	0
Of which: Sampling in connection with official control	57	3	5.3	0	0	1	1.8	1	1.80
Of which broiler parent-breeding									
Sampling (total)	734	5	0.7	1	0.1	0	0	1	0.1
Of which: Sampling instigated by food business operator	734	3	0.4	1	0.1	0	0	1	0.1
Of which: Sampling in connection with official control	732	4	0.5	1	0.1	0	0	1	0.1

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

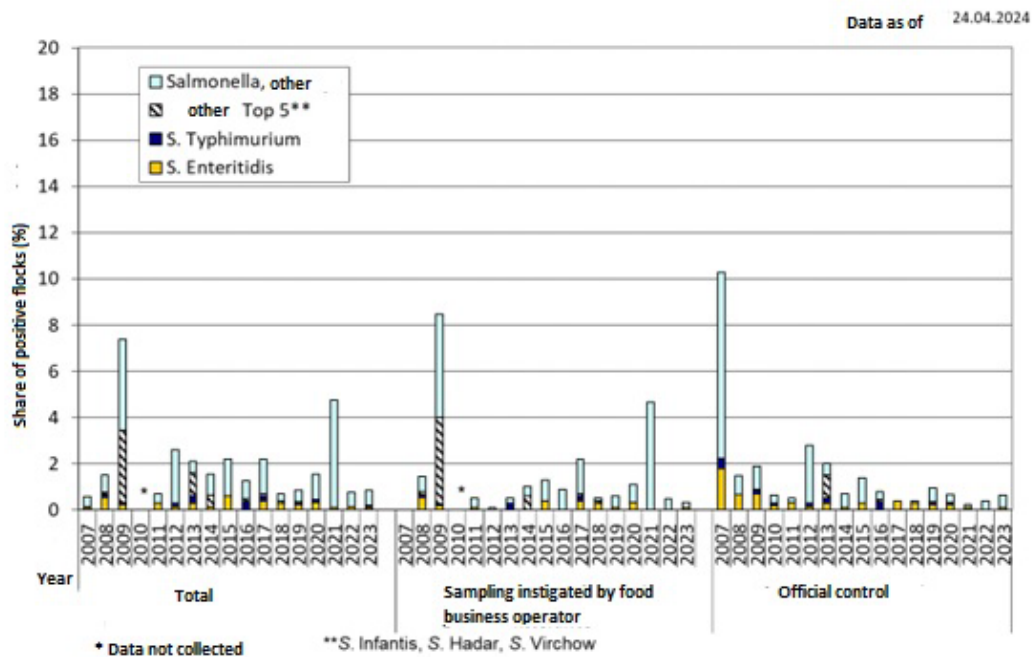


Figure 1: Proportion of flocks of breeding poultry (*Gallus gallus*) from 2007 to 2023, in which *Salmonella* was detected, separated by examination reason and year (** other Top 5 = *S. Hadar*, *S. Infantis*, *S. Virchow*)

Within the examination of breeding poultry (*Gallus gallus*) during rearing, results were reported for a total of 114 flocks examined. Most of the samples were taken at the operators' instigation. In 2023, as in the previous year, *Salmonella* was not detected in any flock. In 2017, *Salmonella* was detected in a total of five flocks, two of which were *S. Typhimurium* and one of which was *S. Infantis*. In the years prior to 2017, *Salmonella* was not detected in any parent flock during the rearing phase either.

2.2 *Salmonella* control programme in laying hens

A total of 6,840 flocks were examined in accordance with Regulation (EU) No. 517/2011 in 2023. *Salmonella* was detected in 63 flocks (0.9 %) (Table 2). This situation corresponded to a more favourable situation compared to the previous year's value (2022: 1.3 %) and reached the level of 2021 (1.0 %). In 34 flocks of laying hen (0.5 %) (in 2022: 59 flocks, 0.8 %; in 2021: 48 flocks, 0.7 %) *S. Enteritidis* or *S. Typhimurium* were detected in the laying phase. *S. Enteritidis* was found in 24 flocks (0.4 %; in 2022: 0.4 %) and *S. Typhimurium* in 10 (0.1 %; in 2022: 0.4 %) of the flocks examined. It is clear that in 2023, the rate of detection for cases of *Salmonella* was once again more favourable than in the previous year and, furthermore, the detection of control-relevant serovars, *S. Typhimurium* and *S. Enteritidis*, dropped.

Table 2: Examination of laying hens (*Gallus gallus*) according to Regulation (EU) No. 517/2011 in 2023

	Number of flocks examined	<i>Salmonella</i>		<i>S. Enteritidis</i>		<i>S. Typhimurium</i>		<i>S. Enteritidis / S. Typhimurium</i>	
		Positive	%	positive	%	positive	%	positive	%
Sampling (total)	6,840	63	0.9	24	0.4	10	0.1	34	0.5
Of which: Sampling instigated by food business operator	6,702	34	0.5	12	0.2	4	0.1	16	0.2
Of which: Sampling in connection with official control	3,518	43	1.2	19	0.5	7	0.2	26	0.7
Of which: Routine sampling in connection with official control	3,451	32	0.9	12	0.3	3	0.1	27	0.8
Of which: Suspected cases and follow-up investigations in connection with official control	67	11	16.4	7	10.4	4	6.0	11	16.4

In 2023, *Salmonella* spp. was identified in the laying phase in 43 of the 3,518 laying hen flocks (1.2 %) by **official control**. *S. Enteritidis* or *S. Typhimurium* were found in 26 flocks (0.7 %). 19 flocks (0.5 %) exhibited *S. Enteritidis* and 7 flocks (0.2 %) *S. Typhimurium*. In 2022, as part of official control, *Salmonella* spp. was identified in 1.8 % of laying hen flocks and *S. Enteritidis* or *S. Typhimurium* was found in 1.1 % of the flocks. Therefore, the overall *Salmonella* detection rate as part of official monitoring decreased compared to the previous year. While the detection rate of *S. Enteritidis* remained at almost the same level, the rate for *S. Typhimurium* decreased more markedly compared to the previous year. Thus, *S. Enteritidis* was dominant just as in previous years while the shift towards *S. Typhimurium* observed in 2022 did not continue.

The detection rates for laying hen flocks during the laying phase from 2008 to 2023 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.

For 2023, **official controls** were performed in 67 flocks due either to a **suspicion or as follow-up investigations**. *Salmonella* spp. was identified in 11 of these flocks (Table 2).

When laying hens were examined during rearing, detection of *Salmonella* was reported in two of the total of 637 flocks examined (0.3 %). One flock showed evidence of the control-relevant serovar *S. Enteritidis* and one further flock of a non-control-relevant serovar. In 2022, positive detection of the control-relevant serovar *S. Enteritidis* was reported in six flocks (0.8 %). Therefore, the situation with regard regarding *Salmonella* spp. has improved somewhat.

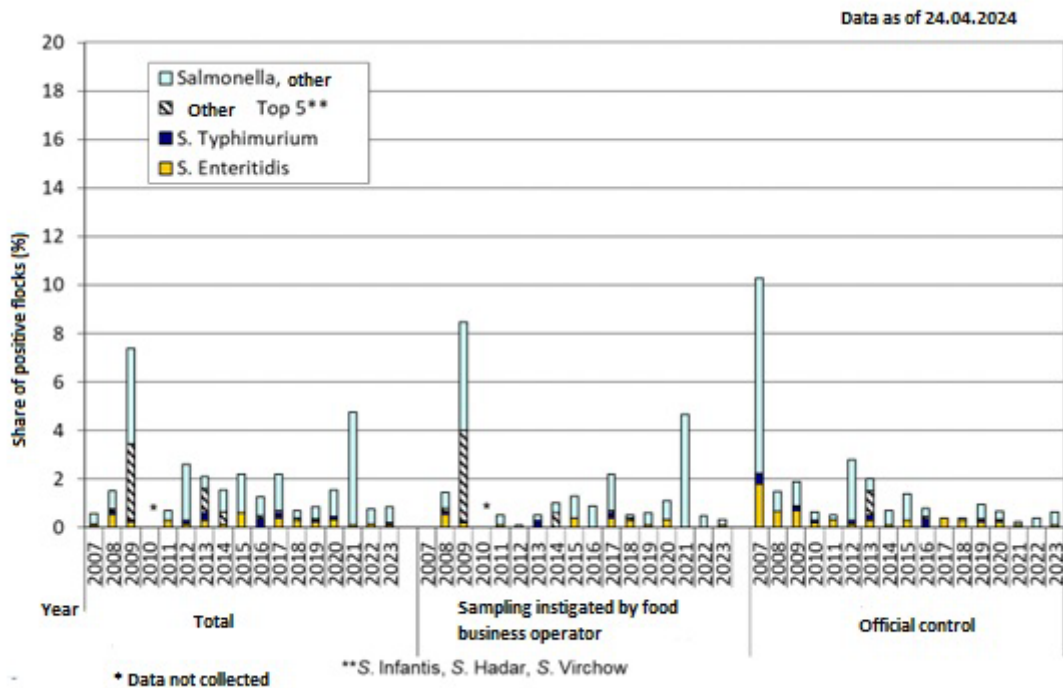


Figure 2: Proportion of laying hen flocks during the laying phase from 2008 to 2023, in which *Salmonella* was detected according to examination reason and year

2.3 *Salmonella* control programme in broilers

A total of 20,486 flocks were examined. *Salmonella* was detected in 204 flocks (1.0 %) (Table 3). In 2022, 0.9 % of the flocks examined also tested positive for *Salmonella* spp. Serovars *S. Enteritidis* or *S. Typhimurium* were found in six flocks (0.03 %) in 2023 (2022: 9 flocks, 0.03 %). *S. Enteritidis* was detected in two (0.01 %) and *S. Typhimurium* in four (0.02 %) of the flocks examined. *S. Enteritidis* (5 flocks, 0.02 %) and *S. Typhimurium* (4 flocks, 0.02 %) were also detected in 2022 (Figure 3). Therefore, in 2023, the detection rate for *Salmonella* spp. as well as for the control-relevant serovars remained at a level similar to that of the previous year. Detection of *S. Infantis* continued to decrease. While in 2022 this serovar was reported in 32 flocks, in 2022 this was the case in only four flocks.

If we consider the detection rates in the context of self-monitoring and official testing separately, differences in the development of *Salmonella* detection rates can be seen in each case (Figure 3).

If we only consider **officially** examined flocks, five of the 294 (1.7 %) examined flocks were found to be positive for *Salmonella*. A control-relevant serovar was not detected in any of

the flocks. Compared to the previous year, the detection rate for *Salmonella* overall and for control-relevant serovars as part of the official investigation in 2023 continued to decrease (1.7 % vs. 2.6 % in 2022). In 2022, *S. Enteritidis* and *S. Typhimurium* had also been detected.

Table 3: Examination of broilers (*Gallus gallus*) according to Regulation (EC) No. 200/2012 in 2023

	Number of flocks examined	<i>Salmonella</i>		<i>S. Enteritidis</i>		<i>S. Typhimurium</i>		<i>S. Enteritidis / S. Typhimurium</i>	
		positive	%	positive	%	positive	%	positive	%
Sampling (total)	20,486	204	1.0	2	0.01	4	0.02	6	0.03
Of which: Sampling instigated by food business operator	20,484	204	1.0	2	0.01	4	0.02	6	0.03
Of which: Sampling in connection with official control	294	5	1.7	0	0	0	0	0	0

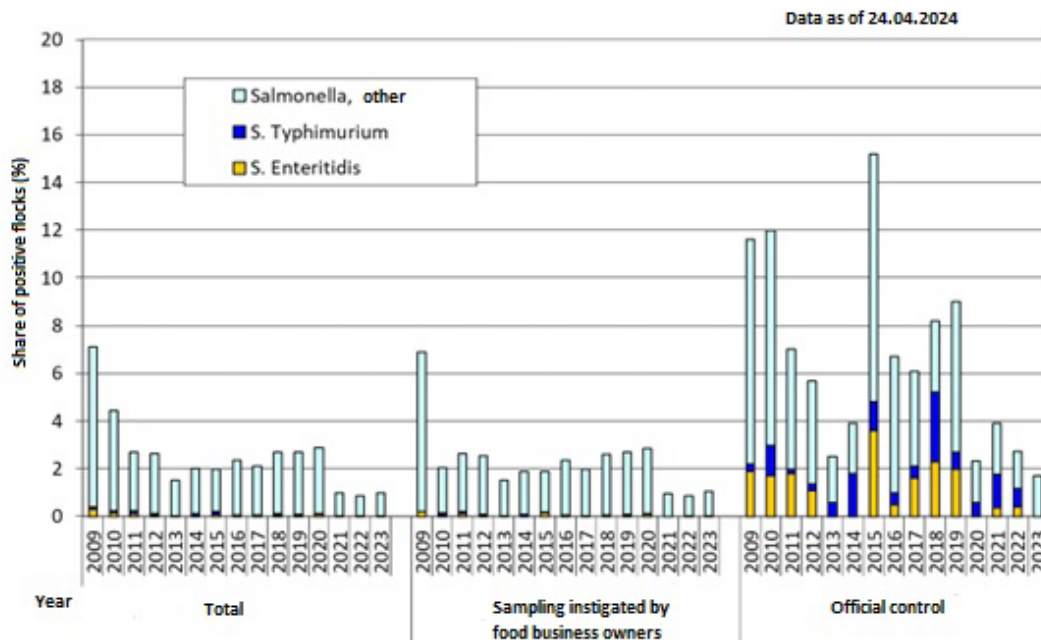


Figure 3: Proportion of broiler flocks from 2009 to 2023, in which *Salmonella* was detected according to examination reason and year

2.4 *Salmonella* control programme for breeding turkeys

In total, examinations of 79 breeding turkey flocks were reported. Of these flocks, two flocks (2.5 %) were positive for *Salmonella* in 2023 (Table 4). The control-relevant serovar *S. Typhimurium* was detected in one of these flocks (1.3 %). These positive flocks were identified in the course of a self-control. In 2022, two positive flocks (2.4 %) were reported. One of the flocks tested positive for the control-relevant serovar *S. Typhimurium* (Figure 4).

During official monitoring, 77 breeding flocks were examined and no *Salmonella* was detected in any of them.

Therefore, no change was observed for *Salmonella* overall.

During rearing, no *Salmonella* was detected in any of the 32 flocks examined. In 2022, two flocks had tested positive for *S. Typhimurium*.

Table 4: Examination of turkey breeding flocks according to Regulation (EC) No. 1190/2012 in 2023

	Number of flocks examined	<i>Salmonella</i>		<i>S. Enteritidis</i>		<i>S. Typhimurium</i>		<i>S. Enteritidis / S. Typhimurium</i>	
		positive	%	positive	%	positive	%	positive	%
Sampling (total)	79	2	2.5	0	0	1	1.3	1	1.3
Of which: Sampling instigated by food business operator	79	2	2.5	0	0	1	1.3	1	1.3
Of which: Sampling in connection with official control	77	0	0	0	0	0	0	0	0

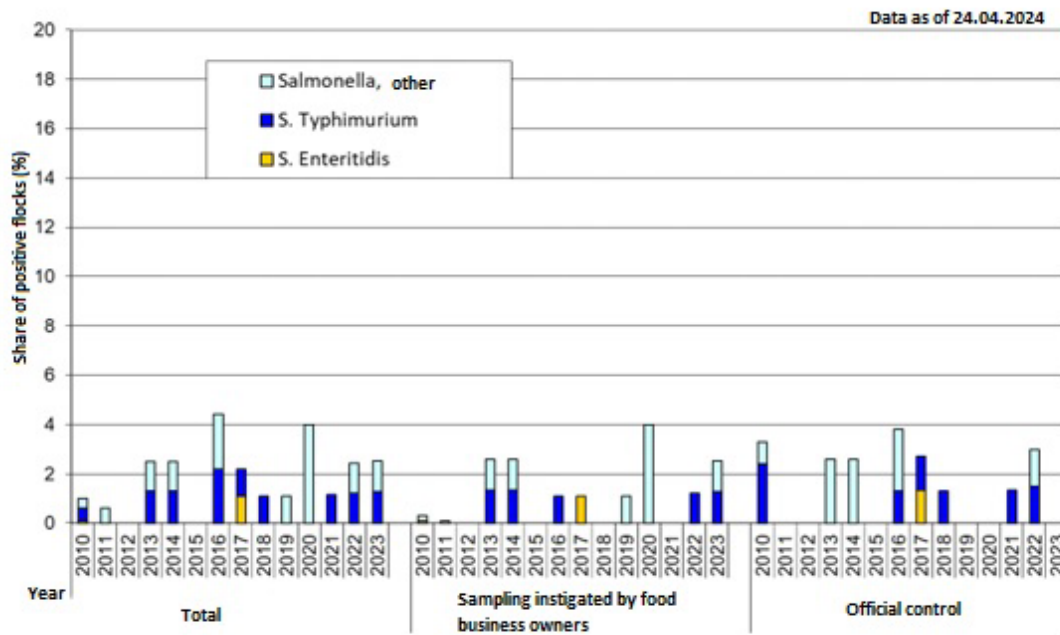


Figure 4: Proportion of breeding turkey flocks from 2010 to 2023, in which *Salmonella* was detected according to examination reason and year

2.5 *Salmonella* control programme in turkeys raised for meat production

A total of 3,819 flocks of turkeys raised for meat production were examined in accordance with Regulation (EU) No. 1190/2012 (Table 5). Of these flocks, 18 (0.5 %) were positive for *Salmonella* spp. In 2023, control-relevant serovars were detected in seven flocks (0.2 %). One flock contained *S. Enteritidis* (0.03 %) and six flocks *S. Typhimurium* (0.2 %). In the previous year, 0.3 % of fattening turkey flocks examined tested positive for *Salmonella*. As regards control-relevant serovars, *S. Typhimurium* (2 flocks, 0.05 %) and *S. Enteritidis* (4 flocks, 0.09%) were detected in 2022 (Figure 5). Therefore, the favourable situation of the last few years with regard to *Salmonella* continued in 2023 and the rate of detection for control-relevant serovars was comparable to the situation in 2022, despite being slightly more unfavourable for *S. Typhimurium*.

Table 5: Examination of fattening turkeys according to Regulation (EU) No. 1190/2012 in 2023

	Number of flocks examined	<i>Salmonella</i>		<i>S. Enteritidis</i>		<i>S. Typhimurium</i>		<i>S. Enteritidis / S. Typhimurium</i>	
		positive	%	positive	%	positive	%	positive	%
Sampling (total)	3,819	18	0.5	1	0.03	6	0.2	7	0.2
Of which: Sampling instigated by food business operator	3,814	12	0.3	0	0	5	0.1	5	0.1
Of which: Sampling in connection with official control	154	5	3.2	1	0.6	1	0.6	2	1.3

A high proportion of positive flocks (3.2 %) was still reported in the **official** investigations, although this is within the range seen in recent years (2022: 3.4 %, 2021: 5.0 %, in 2020: 2.0 %, in 2019: 4.3 %).

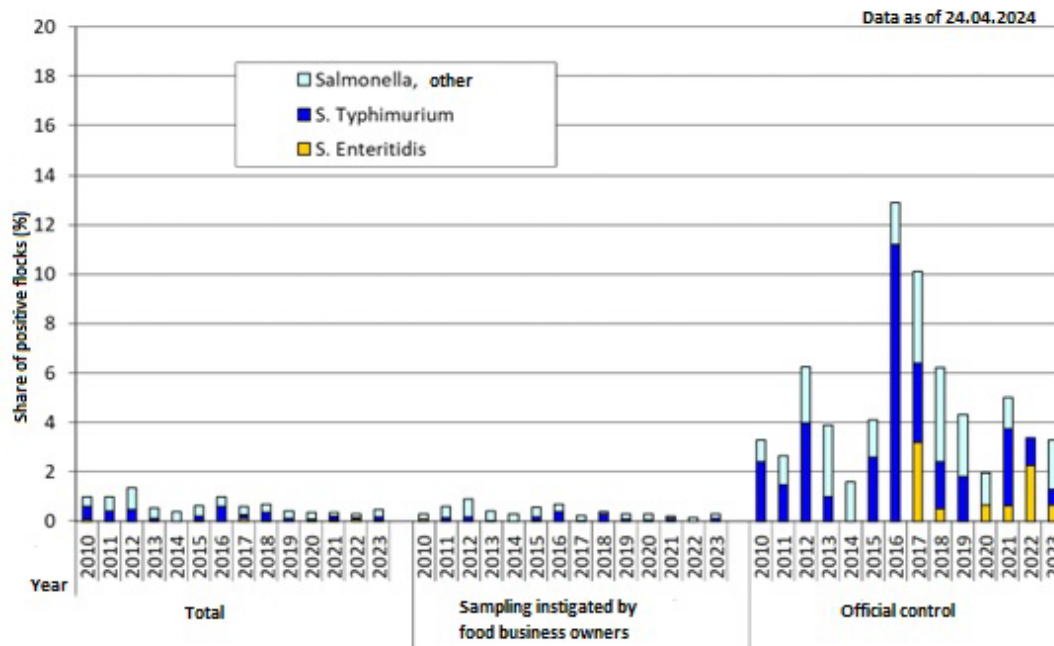


Figure 5: Proportion of fattening turkey flocks from 2010 to 2023, in which *Salmonella* was detected according to examination reason and year

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 2023, they document a favourable situation in terms of the prevalence of *Salmonella* for all animal species and production types considered in the report.

The target values were achieved. 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 0.9 % was below the target value of 2%. Due to the small number of breeding turkey flocks examined, the 1 % threshold is exceeded by the single detection of *S. Typhimurium*, but the number remains in the acceptable range.

The regular investigations of breeding hens and breeding turkeys – including during rearing – show that the serovars *S. Enteritidis* and *S. Typhimurium* can occur there and, if they are not detected in time, may lead to contamination of the following production steps. The detection of *S. Enteritidis* and *S. Typhimurium* in laying hens, broilers and turkeys raised for meat requires continuous monitoring. *S. Enteritidis* and *S. Typhimurium* were reported across all animal species and production types in 2023. The detection of *S. Infantis* in broilers has further decreased; the serovar has not been detected in breeding hens for years. In broilers, this serovar is not one of the control-relevant serovars.

Salmonella was detected in 0.9 % of breeding hen flocks in 2023, 0.2 % of the flocks tested positive for a control-relevant serovar.

In flocks of laying hens, the *Salmonella* prevalence was at 0.9 %; 0.5 % of the flocks tested positive for a control-relevant serovar. For broilers, *Salmonella* was detected in 1.0 % of the flocks, the rate of detection for control-relevant serovars was very low (0.03 %)

In flocks of turkeys raised for meat production, the prevalence of *Salmonella* was at 0.5 %; 0.2 % of the flocks tested positive for a control-relevant serovar.

In the coming years, the situation for poultry is expected to remain stable and the set target values are expected to be met. To this end, it is important that the established procedures and efforts continue to be implemented.

Further information is available on the BfR website

Salmonella topic page:

https://www.bfr.bund.de/en/salmonella_and_their_importance_as_pathogens-10638.html

About the BfR

The German Federal Institute for Risk Assessment (BfR) is a scientifically independent institution within the portfolio of the German Federal Ministry of Food and Agriculture (BMEL). The BfR advises the Federal Government and the German federal states (“Laender”) on questions of food, chemicals, and product safety. The BfR conducts independent research on topics that are closely linked to its assessment tasks.

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Publisher:

German Federal Institute for Risk Assessment

Max-Dohrn-Straße 8–10

10589 Berlin

T +49 30 18412-0

F +49 30 18412-99099

bfr@bfr.bund.de

bfr.bund.de

Institution under public law

Represented by the president Professor Dr Dr Dr h.c. Andreas Hensel

Supervisory Authority: Federal Ministry of Food and Agriculture

VAT ID No. DE 165 893 448

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