



JOINT ECDC-EFSA RAPID OUTBREAK ASSESSMENT

Prolonged multi-country outbreak of *Salmonella* Strathcona ST2559 linked to consumption of tomatoes in the European Union/European Economic Area – first update

23 October 2025

Abstract

A prolonged cross-border outbreak of *Salmonella* Strathcona ST2559 is ongoing in the European Union/European Economic Area (EU/EEA). From 2023 to 30 September 2025, 437 confirmed cases of *S.* Strathcona ST2559 were identified in 17 EU/EEA countries (205 additional cases since the first rapid outbreak assessment published on 12 November 2024): Austria (76), Croatia (3), Czechia (11), Denmark (12), Estonia (2), Finland (5), France (43), Germany (113), Ireland (6), Italy (123), Luxembourg (5), the Netherlands (5), Norway (4), Slovakia (6), Slovenia (10), Spain (3) and Sweden (10). Cases have also been reported in the United Kingdom (73), Canada (10) and the US (24). The most visited country among travel-related cases was Italy.

Tomatoes remain the primary food vehicle in several investigations for this prolonged multi-country outbreak. In 2025, new outbreak investigations in Austria identified small tomatoes from Sicily (Italy) as the source of infection, as was the case for the 2023 outbreak in Austria and the 2024 outbreak in Italy. The same conclusion was reached for a historical *S.* Strathcona ST2559 outbreak in Denmark in 2011.

In response, comprehensive investigations have been carried out by the food safety authority in Italy. The detection of *S.* Strathcona in a sample of irrigation water collected at the site of a tomato producer in Sicily confirmed the role of the environment in tomato contamination. These findings also highlighted the need for a multi-disciplinary strategy integrating environmental assessments to mitigate the risk of *Salmonella* contamination. This need is also confirmed by the detection of the outbreak strain in other matrices connected with aquatic environments.

To prevent new cases from occurring, further investigations should be undertaken to verify whether tomatoes from Sicily are the vehicle of infection and to guide effective control measures during the (pre)harvest period, including irrigation water sources.

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Event background

On 16 August 2025, Norway reported a new case of *Salmonella* Strathcona ST2559 with a sample date in July 2025 (event ID 2023-FWD-00090 EpiPulse, the European surveillance portal for infectious diseases). The case had a travel history to Italy. Following this notification, Italy reported 16 *S.* Strathcona cases with isolation dates between June and August 2025 and 11 other countries have reported *S.* Strathcona ST2559 cases in 2025, confirming an ongoing multi-country outbreak.

This is a re-emergence of the *S.* Strathcona ST2559 strain, which previously caused multi-country outbreaks, as notified by Denmark in 2011 (event ID in EpiPulse 2011-FWD-00034 and RASFF 2011.1630) and in 2020 (event ID 2020-FWD-00032). The vehicle of the first *S.* Strathcona outbreak in 2011 was tomatoes from Sicily (Italy), as shown from several lines of evidence in the outbreak investigation, including patient interviews, a consumer purchase analysis, a case-control study and trace-back/forward analysis from Denmark and the other EU countries involved in the outbreak [1,2].

In October 2023, Germany reported 46 cases of *S.* Strathcona ST2559 infection in the period from August 2023 (event ID 2023-FWD-00090). Sixteen other EU/EEA countries reported linked cases with genetically close *S.* Strathcona ST2559 isolates, confirming a multi-country outbreak. From 1 January 2023 to 2024, 232 confirmed cases of *S.* Strathcona ST2559 were reported in these countries [3]. Investigations in the 2023 outbreak in Austria and in 2024 in Italy confirmed that small tomatoes from Sicily were the vehicle of infection in these two outbreaks [2,3].

Due to the long-term and ongoing risk of infection with this *S.* Strathcona strain in multiple EU/EEA countries and a possible common source in the food chain, in September 2025 the European Commission asked the European Centre for Disease Prevention and Control (ECDC) and the European Food Safety Authority (EFSA) to produce an update of the joint rapid outbreak assessment (ROA) to trigger further public health and food safety investigations.

Outbreak strain characterisation

The outbreak strain is characterised as *Salmonella enterica* serovar Strathcona, with:

- 7-gene sequence type (ST) 2559;
- SeqSphere complex type CT3910 (Enterobase scheme in SeqSphere+); and
- Enterobase hierarchical cluster HC5_26490 [4,5]; or
- a strain sharing the same t10-level SNP address as one of the outbreak strains defined by the UKHSA SNP pipeline [6]: 1.1.1.1.1.% (t10.1 –accession numbers SRR35741503; SRR35412366) [7].

A representative German strain is available in Enterobase: 23-05042 (SAL_ED2423AA_AS).

A representative historical Danish strain from 2020 is available in the European Nucleotide Archive with a code ERR4344279, or in Enterobase with a code 2006F11891.

European outbreak case definition

The European outbreak case definitions are provided below.

A confirmed outbreak case is defined as:

a laboratory-confirmed *Salmonella* Strathcona case with symptom onset on or after 1 January 2023 (date of sampling or date of receipt by the reference laboratory if date of onset is not available);

AND

fulfilling at least one of the following laboratory criteria for an *S.* Strathcona ST2559 isolate:

- the national cgMLST pipeline being within seven cg-allelic differences from the representative German outbreak strain
- clustering within seven cg-allelic differences in a centralised single-linkage analysis
- belonging to the hierarchical HC5_26490 cluster (Enterobase scheme);

OR

fulfilling the epidemiological criterion:

- epidemiologically linked to a confirmed case based on a national outbreak case definition.

A historical outbreak case is defined as:

a laboratory-confirmed *S. Strathcona* case with symptom onset before 1 January 2023 (date of sampling or date of receipt by the reference laboratory if date of onset is not available);

AND

fulfilling at least one of the following laboratory criteria for an *S. Strathcona* ST2559 isolate:

- the national cgMLST pipeline being within seven cg-allelic differences from the representative German outbreak strain
- clustering within seven cg-allelic differences in a centralised single-linkage analysis
- belonging to the hierarchical HC5_26490 cluster (Enterobase scheme).

OR

fulfilling the epidemiological criterion:

- epidemiologically linked to a confirmed case based on a national outbreak case definition.

Epidemiological and microbiological investigations of human cases

EU/EEA countries

This section summarises the epidemiological and microbiological investigations of human cases after the publication of the first rapid outbreak assessment (ROA) on the multi-country outbreak of *S. Strathcona* ST2559 infections linked to consumption of tomatoes, published on 12 November 2024 [3].

In 2025, 14 countries have reported 93 new confirmed cases of *S. Strathcona* ST2559 (Table 1). Although the cases were reported throughout the year, the majority were between June and September. Cases were reported in all age groups, from infants to the elderly and, of the confirmed cases with gender information available, 35 were males and 42 females. The three countries with most cases in 2025 are Austria (22), Germany (16) and Italy (25). The 23 travel-associated cases with known travel destination visited a total of seven countries and the most frequently visited country was Italy (18 cases).

In total, since 1 January 2023 and as of 30 September 2025, 437 confirmed cases of *S. Strathcona* ST2559 have been identified in 17 EU/EEA countries: Austria (76), Croatia (3), Czechia (11), Denmark (12), Estonia (2), Finland (5), France (43), Germany (113), Ireland (6), Italy (123), Luxembourg (5), the Netherlands (5), Norway (4), Slovakia (6), Slovenia (10), Spain (3) and Sweden (10). Among the 379 cases with age and gender data available, females were more frequently affected than males. From the information available on travel history, a total of 86 cases from the EU/EEA countries reported travel to other countries within the incubation period. The most frequently visited country was Italy (57/86 cases; 66%).

Tomatoes were identified as the vehicle of infection in several national epidemiological investigations and patient interviews undertaken in response to this multi-country outbreak during the period 2023–2024, as described in the first ROA, published in November 2024 [3]. This is further supported by the national investigation which included both patient interviews and trace-back investigations in Austria in 2025.

Outside the EU/EEA

UK has reported 73 cases since 1 January 2023 clustering within the outbreak. Cases reported in 2023 (n=20), 2024 (n=21) and 2025 (n=32). Among the cases in 2025, a total of 21 declared travel via laboratory isolate referral forms and questionnaires, with destinations including Italy (n=16) and Malta (n=5).

Canada has reported five new cases since the first published ROA (ten cases in total, seven cases with confirmed travel history to Europe). Two new cases were from 2024 and three cases from 2025. Two of these five cases have known information on travel, and both reported having visited Italy.

The US has reported a total of 24 cases: 11 cases from 2024 and 13 cases from 2025. Travel information was available for six of the cases in 2024, the countries visited prior to onset of disease were Italy (5) and Poland (1).

Table 1. Confirmed (and suspected) *S. Strathcona* ST2559 cases by disease onset, gender and age range in 14 EU/EEA countries (n=86 confirmed cases), 1 January 2025 to 30 September 2025

Country	Number of confirmed cases (whole genome sequencing (WGS) pending)	Onset of the disease (timeframe)	Male	Female	Age range (years)	Travel history prior to illness: country (number of confirmed cases)
Austria	22 (9)	One from January 2025 and 30 cases from July–September 2025	12 (5)	10 (4)	10–79 (3–79)	Italy (2)
Czechia	1 (2)	June (suspected cases in September)	0 (1)	1 (1)	30–39 (23–49)	Unknown
Denmark	3	July/September	0	3	30–59	Italy (1) and Italy and Scotland, UK (1)
Finland	1	June	0	1	40–49	Unknown
France	8	July–September	5	3	7–51	Italy (1)
Germany	16 (15)	March–August	7 (8)	9 (7)	0–79 (4–89)	Three cases travelled to Italy (2) and Bosnia and Herzegovina (1)
Ireland	5	July–August	2	3	40–79	Italy (4) and Croatia (1)
Italy	25 (31)	January to September	4 (12)*	8 (17)*	0–99 (0–99)	Unknown
Luxembourg	2	August–September	1	1	30–39	Italy (2)
Netherlands	2	July–August	1	1	15–89	Unknown
Norway	1	July	1	0	50–54	Italy
Slovakia	1	September	(1)	1	10–19 (5–10)	Malta (1)
Spain	2	August–September	1	1	20–69	Türkiye and Croatia (1) and Austria (1)
Sweden	4 (5)	May–September	1*	*	60–69	Italy (4)
Total EU/EEA	93 (62)		35 (27)	42 (29)		

EU/EEA: European Union/European Economic Area.

*Gender information was not available for all cases.

Investigations by country

Austria reported an updated number of confirmed cases from January 2023 and December 2024 (54 cases). Of these, 25 cases were reported in 2023 and 29 cases in 2024, with an equal gender distribution and cases in all age-groups from infants to the elderly (oldest case 102 years). The travel related cases had visited Croatia (1), Montenegro (2), Italy (7) and Slovenia (1). As reported in the first ROA, national outbreak investigations, including case interviews and traceback investigations, identified imported organic cherry tomatoes from one supermarket chain as the suspected vehicle of infection. On 18 January 2024, the food safety authority in Austria issued an RASFF notification (News 2024.0384) based on the food exposure information. Transmission between humans and animals was reported in a laying hen farm that is owned and operated by a person who fell ill with an *S. Strathcona* ST2559 infection in November 2023. As of October 2024, two flocks and one batch of eggs have tested positive for *S. Strathcona*. In 2025, Austria has reported a total of 22 confirmed and nine suspected cases of *S. Strathcona* ST2559, one from January 2025 and 30 cases during the period July–September 2025. The cases were distributed across five provinces with a median age of 35 years (range 3–77). Upper Austria was the region most affected. Fourteen cases are female, and nine cases have been hospitalised. Two cases reported travel history to Italy prior to illness. Epidemiological data were available for eight of 31 cases. All eight cases reported the consumption of small tomatoes. The most recent investigation in Austria related to an outbreak of gastroenteritis in a family in Upper Austria. Small red tomatoes were purchased on 9 August 2025 and consumed by all seven family members on 11 August. All family members fell ill simultaneously, showing symptoms consistent with a *Salmonella* infection. Two individuals in the family submitted stool samples, *Salmonella* isolates were detected in both samples, sequenced and confirmed as outbreak strains. For further information see section Annex 1. 'Traceability investigations and control measures implemented, by country'.

Czechia has no new reported cases from 2023–2024 since the first ROA was published (10 confirmed cases). The patient interview was described in the first ROA, and the food items reported by the case were a ground beef hamburger, chicken meat, ham, paté, scrambled eggs, ice cream, tomatoes, melons, apples and chocolate products during a vacation to Vis island in Croatia [3]. In 2025, four cases of *S. Strathcona* were reported. The *Salmonella* isolates were sequenced from two of these cases, one of which met the definition of a confirmed outbreak case of *S. Strathcona* ST2559. The remaining two cases were classified as suspected cases.

Denmark has not reported new cases from 2023–2024 since the last ROA was published and the number of confirmed cases of *S. Strathcona* ST2559 is still nine. The national outbreak investigations, including case interviews, were described in the first ROA [3]. Three patient interviews were conducted for cases with sample dates in 2023. Two of the cases had been travelling prior to disease onset, one to Montenegro and another to Italy, and both had consumed tomatoes there. One domestic case, with a sample date in December 2023, did not report eating tomatoes. Those involved in the two cases from 2024 that were interviewed had both consumed tomatoes, one specifically mentioned eating cherry or datterino tomatoes. Denmark has reported related clusters and outbreaks of *S. Strathcona* before, and these were also described in the first ROA [3]. In 2011, Denmark investigated a larger outbreak, with 43 cases reported. The confirmed vehicle in this outbreak was tomatoes from Sicily, as shown from several lines of evidence in the outbreak investigation, including patient interviews, a consumer purchase analysis, a case-control study and trace-back/forward analysis from Denmark and the other EU countries involved in the outbreak (RASFF 2011.1630) [1]. In 2020, Denmark reported an outbreak of 27 cases and the suspected vehicle of infection was snack tomatoes (ID 2020-FWD-00032). Finally, in 2022, Denmark once again observed an increase in the number of cases (seven). In 2025, Denmark has reported three new cases to date (6–7 AD from the 2023 reference strain), all of which were in women aged 30–59 years. The first case had disease onset in early July and reported Scotland (UK), Denmark and Italy as possible countries of exposure. The other two cases had a sample date in September, one had a travel history to Italy, and the other reported no travel prior to illness. Two of the three cases from 2025 have been interviewed and both reported consumption of cherry tomatoes.

Estonia has reported one additional confirmed case from the period 2023–2024 since the first ROA (two cases in total). The new case is a young boy with a travel history to Italy. No *S. Strathcona* cases have been reported in Estonia in 2025.

Finland has not reported any new cases from the period 2023–2024 since the first ROA (four cases). In 2025, one *S. Strathcona* ST2559 case was detected in June. The case is a female in the 20–30 years age group, with an unknown travel history.

France has reported 35 new cases for the period 2023–2024 (updated number of cases since the first ROA, with 24 cases in 2023, and 11 cases in 2024). The cases range in age from 0–82 years (median age 24 years), 25 are females and ten males. Most of the cases (n=31) were diagnosed between August and December. Information on country of exposure was available for 16 cases: Italy (6); Spain, Tunisia and Italy (1); Montenegro and Croatia (1), with the rest being domestic cases (8). According to patient interviews from 13 cases, as reported in the first ROA, the following food items were mentioned: chicken (13), cherry tomatoes (10), salad (9) and eggs (9). In 2025, France has reported eight cases of *S. Strathcona* ST2559, diagnosed between mid-July and September. Cases range in age from 7–43 years (median age 25 years), three are females and five are males. Of the cases reported in 2025, three are confirmed as domestic and one is travel-related (Italy). Country of exposures is unknown for the remaining cases.

Germany reported 97 confirmed *S. Strathcona* ST2559 cases from February 2023 to November 2024 (updated number of cases since the first ROA). The cases were reported from all age groups (0–90 years), with 46 males and 51 females. Travel histories reported are to Croatia (8), Italy (15), and both Montenegro and Croatia (1). Germany has also reported 81 historical cases during the period 2011–2022 [3]. As reported in the first ROA, 24 patient interviews from cases in 2023 reported consumption of tomatoes (21/24; large tomatoes (16/24) and small tomatoes (14/24)), eggs (17/24), cucumbers (16/23), apples (16/23), gouda cheese (15/23), leaf lettuce or leafy vegetables (15/23), iceberg lettuce (14/24), salami (12/21) and peppers (13/23) [3]. The patient interviews conducted in 2024 revealed consumption of different kinds of tomatoes by all five cases interviewed. Other food items frequently mentioned were cucumbers (3/4) and leafy salad (5/5) [3]. In 2025, 16 confirmed cases have been reported (seven males and nine females, age 0–80 years). The date for disease onset is known for eight of the confirmed cases and ranges from June to August 2025. The country of exposure has been reported for six cases and three of them are considered domestic, while the other three had travelled to Bosnia and Herzegovina (one case) and Italy (two cases) prior to illness. In addition, Germany has also reported 15 cases of *S. Strathcona* that have not yet been sequenced. In 2025, no interviews have been conducted.

Ireland has not reported any new cases for the period 2023–2024 since the first ROA (one case in 2024, and two historical cases from 2020 and 2021). As stated in the first ROA, the preparation and consumption of chicken and raw leafy salad were reported in the patient interview. In 2025, Ireland has reported five cases of *S. Strathcona* ST2559, with sampling dates between July and September. Cases range in age from 40–73 years, three are females and two are males. Two of the cases are in the same family and both travelled to Italy. Of the remaining three cases, two single cases travelled to Italy and one single case travelled to Croatia.

Italy has reported an updated number of cases since the first ROA, with 42 and 41 sporadic cases of *S. Strathcona* ST2559 in 2023 and 2024, respectively. More than 90% of the isolates had sampling dates between late July and mid-December in 2023 and most cases had sampling dates between July and September in 2024. From late September to early October 2024, two Italian regions (Tuscany and Umbria) reported *Salmonella* outbreaks, with an additional 56 confirmed *S. Strathcona* cases in 2024.

- In the Tuscany region, a total of 248 cases of gastroenteritis have been identified (93 confirmed as salmonellosis and 14 identified as *S. Strathcona*) affecting 240 children aged 1–10 years, seven food workers and one teacher in 39 schools, with exposure to meals prepared at a single catering facility. The date of symptom onset ranged from 19 September to 4 October 2024, with 20 September reported for most cases (n = 103). Of these cases, 130 were in females and 103 were in males. Among the adults, the age range for cases was 24–65 years. Fourteen clinical isolates, selected from different schools and across the period of symptom onset, were identified as *S. Strathcona* serovar and fully sequenced: they show 10–11 AD with the reference German outbreak strain with the national cgMLST pipeline. In addition, a food isolate (composite food spelt with tomatoes and pesto)

resulted in the identification of *S. Strathcona* ST2559, showing 2-3 AD with the outbreak strains (see 'Annex 1. Traceability investigations and control measures implemented, by country').

- In the Umbria region, a total of 63 cases of salmonellosis (n=42 confirmed as *S. Strathcona*) were identified among individuals attending education establishments that shared a catering facility and the staff working there. Of these cases, 56 were in children aged 1–10 years (16 male, 16 female and 24 without gender information) from nine different schools, where a total of 624 children were enrolled. Four were in food workers (of the total 21 people working at the catering facility). One child from a primary school was not served by the same catering facility. Two cases did not attend these schools; one was a sibling of another case who did and the other attended a secondary school where meals from the catering facility were not consumed. The secondary student also did not have any kinship link to the other cases. The date of symptom onset ranged from 26 September to 17 October 2024, with 27 September reported for most cases (n=16). Fifteen representative strains were fully sequenced and confirmed as *S. Strathcona* ST2559 cases. Comparison with the outbreak strains from Tuscany showed 9–10 AD with the national cgMLST pipeline. In this outbreak the food vehicle was not identified.

Between January and 15 September 2025, a total of 59 *S. Strathcona* cases were reported in Italy (27 female, 16 male and 16 unknown gender information; age ranging from eight months to 92 years). It is interesting to note that 52 cases were detected between June and September 2025 and 31 isolates were reported in one region. Whole genome sequencing (WGS) data are available for 28 of 59 isolates confirming *S. Strathcona* ST2559, while sequencing is still pending for the remaining 31 isolates. The sequences of 25 isolates showed closed genomic correlation (≤ 7 AD) with the 2023 German reference strain with national cgMLST pipeline. Among the 31 cases reported from one region, WGS data were available for seven isolates which clustered within 0–10 AD, indicating a relatively wide range of genetic distance. Interestingly, five isolates tested positive for lactose fermentation, which is atypical for *Salmonella*. WGS is available for four of these isolates and shows 6–8 AD to the 2023 reference strain. This uncommon characteristic could cause an underestimation of *Salmonella* isolates. For 2025, epidemiological data are only available for 12 of 59 cases as investigations are still ongoing. Of these 12 cases, six were confirmed and the other six were suspected. Three cases reported having consumed raw tomatoes and one cooked tomatoes. One case is in an infant for whom consumption of formula milk, vegetable broth and baby food were reported and another case reported consuming tiramisù.

Luxembourg has reported one additional confirmed case from the period 2023–2024 since the first ROA (in total three cases). One case in 2023 did not report travel, whereas the two cases reported in September and October 2024 both had a recent history of travel. The first case had visited Italy, Greece, and Türkiye as part of a cruise itinerary, while the second had travelled to Italy. In addition, four historical cases have been reported from Luxembourg (one in 2022 and three in 2021). The patient interviews from 2023–2024 (two cases) were reported in the first ROA, and mention vegetables from various sources, buffet food on the cruise ship, fresh fruit and scrambled eggs. In addition, one case had contact with a younger brother who had experienced diarrhoea a few days before, but was not tested. In 2025, Luxembourg has reported two new cases of *S. Strathcona* (4-5 AD from the 2023 reference strain), both cases being reported in September. The first case is a male in the age group 30–40 years with a sample date of 9 September. The second case is a 40-year-old female, with a sample date of 25 September. Both cases reported travel to Italy and consumption of tomatoes prior to disease onset. One case reported consumption of different kinds of fresh tomatoes every day during the visit, and the other case consumed cherry tomatoes the day before symptom onset.

The Netherlands reported three *S. Strathcona* ST2559 cases with unknown travel history between September 2022 and December 2024. In 2025, two additional confirmed cases (6–7 AD to the 2023 reference strain) have been reported. The cases were reported in July (one woman aged over 80 years) and August (one male in the age group 15–25 years). Travel history is unknown for both cases.

Norway has not reported any new cases for the period 2023–2024 since the first ROA (three cases with sampling dates in September 2023 and 2024). In addition, Norway has three historical *S. Strathcona* ST2559 cases with sampling dates in 2019, 2020 and 2021, and reported travel to Italy (two cases) and Denmark (one case). In 2025, Norway has reported one confirmed case (3 AD to the reference strain from 2023). The case has a sample date in July 2025 and is a male in the 50–60 years age group. The case reported travel to Italy prior to symptom onset.

Slovakia has not reported any new cases for the period 2023–2024 since the first ROA (five cases). In 2025, Slovakia has reported two new cases, one of which has been confirmed, with a sample date in September. The cases are two children aged six and 12 years, one with a travel history to Malta and the other to Italy. The strain from the child who travelled to Malta was sequenced, ST 2559, closely related to reference strain (AD=5). WGS from the second case (with travel history to Italy) is pending.

Slovenia has reported eight additional confirmed cases for the period 2023–2024 since the first ROA (ten cases in total). No new cases have been reported in 2025.

Spain has not reported any new cases for the period 2023–2024 since the first ROA (one case). In 2025, Spain has reported two confirmed cases (one female and one male in the age group 20–70 years). Both cases are travel associated. The female had disease onset on August 22 and travelled to Turkey (11–18 August) and Croatia (18–21 August). She reported consumption of cherry tomatoes at the airport in Turkey. She travelled together with her partner, and they shared foods and the partner also developed symptoms on 20 August but has not been tested. The second confirmed case from Spain reported travel to Austria with the family prior disease onset on 14 September. He bought a salad with tomatoes from a supermarket, and he did not share the salad with the family. He was the only one in the family who developed symptoms.

Sweden has not observed any additional cases for the period 2023–2024 since the first ROA (six cases). In 2025, Sweden reported four additional cases. The first case in 2025 was reported in May and is a male in the age group 60–70 years with a travel history to Italy. The other three cases in 2025 were part of a group that travelled to Italy in mid-September. In addition, five more cases of salmonellosis have been reported in the same group of travellers, although these strains have not been further analysed.

Microbiological and environmental investigations of food and control measures

This section summarises the food investigations and control measures implemented by the Member States involved after the publication of the first rapid outbreak assessment on the multi-country outbreak of *S. Strathcona* ST2559 infections linked to consumption of tomatoes on 12 November 2024 [3].

On 7 April 2025, the food safety authority in Italy shared in RASFF the outcome of the national sampling plan announced on 7 October 2024, during the publication of the first rapid outbreak assessment, and completed on 31 December 2024 (*fup13*, *fup15*, *fup23*, 2024.0384).

This section describes the national sampling plan and the results of the sampling activities (*fup23*, 2024.0384). The national sampling aimed to collect the cherry tomatoes available on the national market and test them for *Salmonella*, including those originating from the suspected region in Italy (Sicily) (*fup13*, *fup15*, 2024.0384).

In addition, the section summarises the extensive activities carried out in Sicily by the food safety authority to gather useful data for outbreak management (*fup23*, 2024.0384). The key activities included an audit carried out by the Ministry of Health during which various matrices were collected (18–21 November 2024); a target sampling plan performed by the local authorities, focusing on agricultural farms producing tomatoes and basil and epidemiologically and microbiologically linked to the outbreaks in Tuscany and Umbria (2–5 December 2024); and additional investigations following the detection of *Salmonella* in a cherry tomato sample collected as part of the national sampling plan (*fup23*, 2024.0384).

Description of the national sampling plan, results of sampling activities and recommendations

The national food safety authority provided the regional authorities with the following operational instructions on the sampling plan: at least one sampling of tomatoes would be carried out by each competent authority (local health unit across the country) by 31 December 2024 in accordance with the requirements of the official control legislation (EU Reg. 2017/625 and its national transposition Decreto Legislativo 2021/27). The products would be sampled in a single aliquot, possibly consisting of five sample units, to increase the probability of detecting *Salmonella*, given its heterogeneous distribution in the matrix analysed. The reference method ISO 6579-1:2017/Amd1:2020 would be used and any *Salmonella* isolates would be serotyped. In the event of samples testing positive, an RASFF notification would be issued in accordance with Article 14 of Regulation (EC) No. 178/2002. Data deriving from the plan would be transmitted through the national IT platform (RaDISAN) (*fup23*, 2024.0384).

Overall, 122 samples were collected, spanning the period 30 September to 10 December 2024. The 122 official samples consisted of 71 cherry tomatoes and 51 plum tomatoes. Samples were taken from the market in Italy and therefore not at primary production level. The highest number of samples was collected in Sicily, followed by other Italian regions (*fup23*, 2024.0384). Of the 122 tomato samples, one sample of cherry tomatoes, originating from Sicily and detected in northern Italy, tested positive for *Salmonella* Infantis. This finding consequently led to further food investigations, detailed in a new RASFF notification (2025.0618) (Annex 1). The trace back analysis of the sample that tested positive for *S. Infantis* allowed the identification of the Italian Producer I, which was further inspected (*fup23*, 2024.0384; 2025.0618). The official sampling carried out at this primary producer (Italian Producer I; sampled on 22 November 2024) led to the detection in January 2025 of *S. Strathcona* (Table 3) from a sample of irrigation water taken from a well (*fup1*, *fup2*, *fup3*, 2025.0618) (Annex 1).

As a result of the national sampling plan, the food safety authority in Italy considered it useful to collect further samples at primary production level, proportionate to the tomato production capacity in each region (e.g. number of tomato producers), and at distribution level, proportionate to the population in each region (*fup23*, 2024.0384).

Results on the audit carried out in Sicily (18–21 November 2024) and recommendations

The national food safety authority (Ministry of Health), supported by the National Institute of Health, ISS, performed an audit in Sicily to assess the effectiveness of the regional and local system of official controls in relation to the production and commercialisation of food of non-animal origins (specifically cherry tomatoes), as per Regulation (EU) No. 2017/625.

Overall, the audit identified significant areas for improvement in personnel, regional coordination, data management, and official control activities. Some of the main issues found by the audit team were staff shortages, lack of systematic inspections and management plans for irrigation water, and inconsistencies in the documentation and control procedures compromising the effectiveness of the official controls and the compliance with Regulation (EU) No. 2017/625.

The national food safety authority made several recommendations, including addressing the staff shortage, increasing staff training, promoting the sharing of information among the local institutions, enhancing the IT system for faster data sharing, implementing a planned sampling and analysis of the irrigation water used by the food operators, and establishing procedures for timely interventions in emergencies, particularly in response to health alerts.

Results of the target sampling plan performed by the local authorities in response to the Tuscany and Umbria outbreaks (2–5 December 2024)

The local food safety authority in Sicily carried out further official controls at the premises of the tomato producers identified as part of the outbreak in Tuscany and Umbria (*fup23*, 2024.0384; *fup7*, 2024.7763; *fup5*, 2024.8497) (Annex 1). Testing revealed no *Salmonella* detection. Table 2 summarises the results of the official sampling efforts.

Table 2. Results of the microbiological investigations as part of the official controls at the premises of tomato and basil producers identified in the outbreak in Tuscany and Umbria

Producer	Total number of samples	Matrix (number of samples)	Link to the regional outbreak	<i>Salmonella</i> detection
Producer D	46	Picadilly tomatoes (n=30) Cherry tomatoes (n=1) Soil (n=9) Organic Fertiliser (n=2) Water (n=4)	Tuscany	None
Producer J	58	Datterino tomatoes (n=30) Soil (n=20) Water (n=8)	Tuscany	None
Producer E	44	Tomatoes (n=20) Soil (n=20) Water (n=4)	Tuscany	None
Producer C	16	Tomatoes (n=0)* Soil (n=10) Organic Fertiliser (n=2) Water (n=4)	Tuscany	None
Producer F	46	Cherry tomatoes (n=30) Soil (n=10) Organic Fertiliser (n=2) Water (n=4)	Tuscany	None
Producer G	44	Cherry tomatoes (n=15) Datterino tomatoes (n=15) Soil (n=10) Dry manure (n=2) Water (n=2)	Umbria	None
Producer H	44	Basil (n=30) Soil (n=10) Water (n=4)	Umbria	None

* Tomato samples could not be collected as the plants were not yet in production.

Results of the additional sampling activities, performed by the regional authorities at the premises of livestock operators (December 2024)

The local food safety authority in Sicily also included livestock plants in the outbreak investigation. Testing revealed *Salmonella* detection. Table 3 summarises the results of the official sampling efforts (*fup23*, 2024.0384).

Table 3. Results of the microbiological investigations as part of the official controls at the premises of livestock-related operators

Plant	Total number of samples	Matrix (number of samples)	<i>Salmonella</i> detection
Poultry farm*	28	Faeces (n=8) Internal environmental swabs (n=10) External environmental swabs (n=4) Feed (n=1) Water (n=5)	<i>S. Goldcoast</i> (one sample of faeces)
Dairy farm**	13	Faeces (n=5) Environmental swabs (n=4) Water (n=3) Feed (n=1)	None

* This farm is the origin of a broiler carcass (collected at the slaughterhouse during an official control on 21 October 2024) which tested positive for *S. Strathcona* and was detected prior to the reported additional sampling activities.

** *S. Strathcona* detected prior to the reported additional sampling activities (30 October 2023).

Results of further additional sampling activities

The national food safety authority shared in RASFF the outcome of further official controls (*fup*23, 2024.0384) carried out in November 2024. Testing revealed the *Salmonella* detection. Table 4 summarises the results of the sampling efforts.

Table 4. Results of the microbiological investigations as part of further official controls

Food Operator	Total number of samples	Matrix (number of samples)	<i>Salmonella</i> detection (type of positive sample)
Producer I*	15	Tomatoes (n=8) Water (n=7)	<i>S. Strathcona</i> , <i>S. Cerro</i> , <i>S. enterica</i> subsp. <i>salamae</i> 41:z10:1,2 (all isolates from three water samples).
Producer L	6	Tomatoes (n=2) Water (n=3) Substrate (n=1)	<i>S. Enteritidis</i> (one substrate sample used for tomato cultivation).
Producer F	4	Tomatoes (n=1) Water (n=3)	<i>S. Braenderup</i> (one water sample)
Producer J	1	Water (n=1)	None
Producer A**	4	Tomatoes (n=1) Water (n=3)	None***

* Identified as part of the national sampling plan as a primary producer of the tomatoes that tested positive for *S. Infantis* (2025.0618).

** Identified in the previous ROA and linked to the outbreak in Austria.

*** One water sample taken at the greenhouse outlet had an *E. coli* value of 1100 cfu/100 ml.

Figure 1 below presents an overall visual representation of the traceability of the suspected organic cherry tomatoes, microbiological investigations, and related updates, as reported by the countries involved in RASFF (2025.0618, 2024.0384, 2024.7763 and 2011.1630).

Annex 1 provides a summary of the traceability updates (only) for the food investigations performed by the countries involved and shared after the publication of the first ROA on 12 November 2024. Previous investigations remain available in the previous ROA¹.

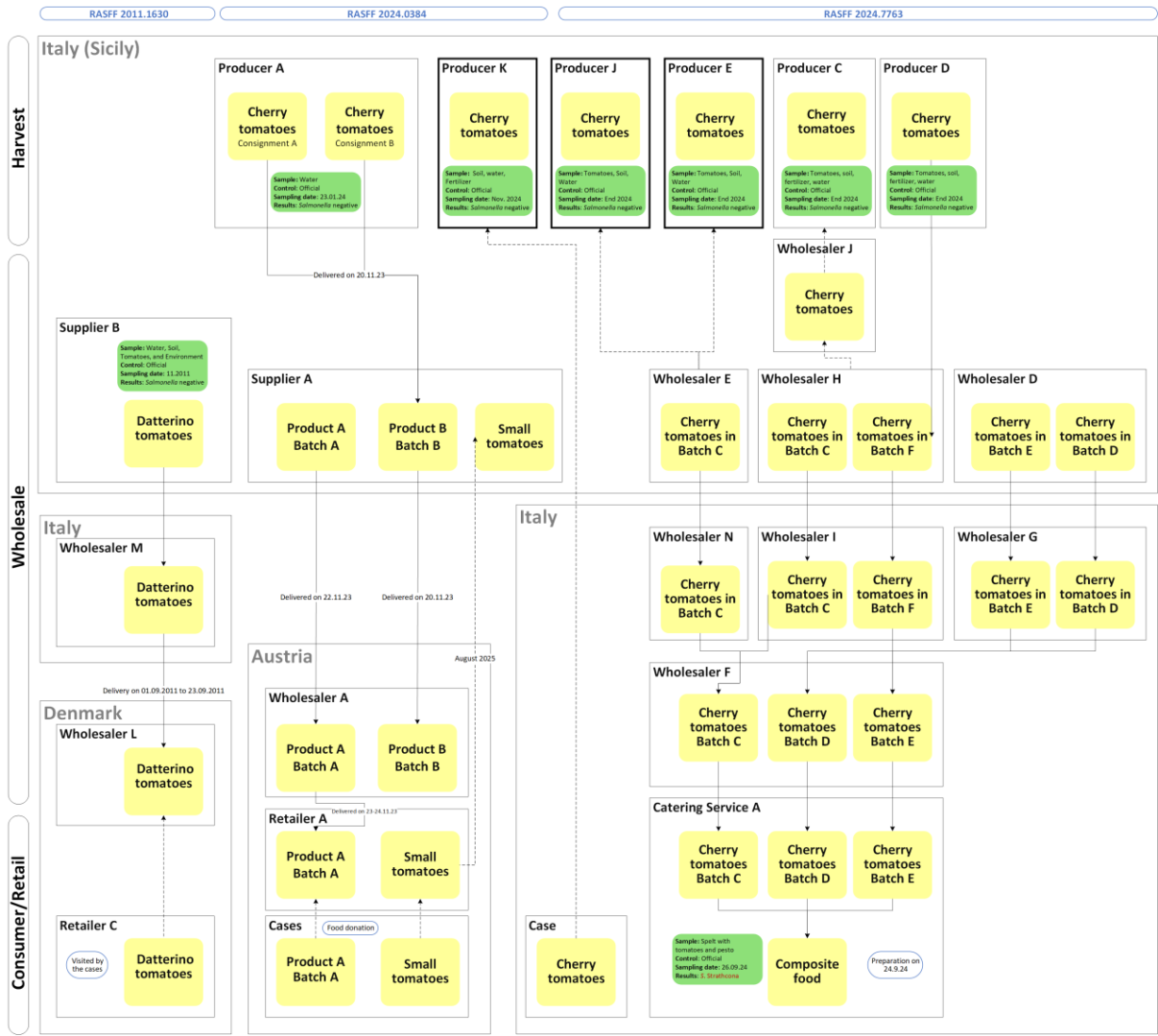
As of 15 October 2025, five RASFF notifications were included:

- RASFF 2025.0618 Information Notification for Attention (11 European Commission (EC)-validated follow-ups (*fup*) and 4 Member States (MS) -validated *fup*)
- RASFF 2024.0384 News (25 EC-validated *fup*)
- RASFF 2024.7763 Information Notification for Attention (8 EC-validated *fup* and 5 MS-validated *fup*)
- RASFF 2024.8497 News (5 EC-validated *fup*)
- RASFF 2011.1630 Alert Notification (13 EC-validated *fup*).

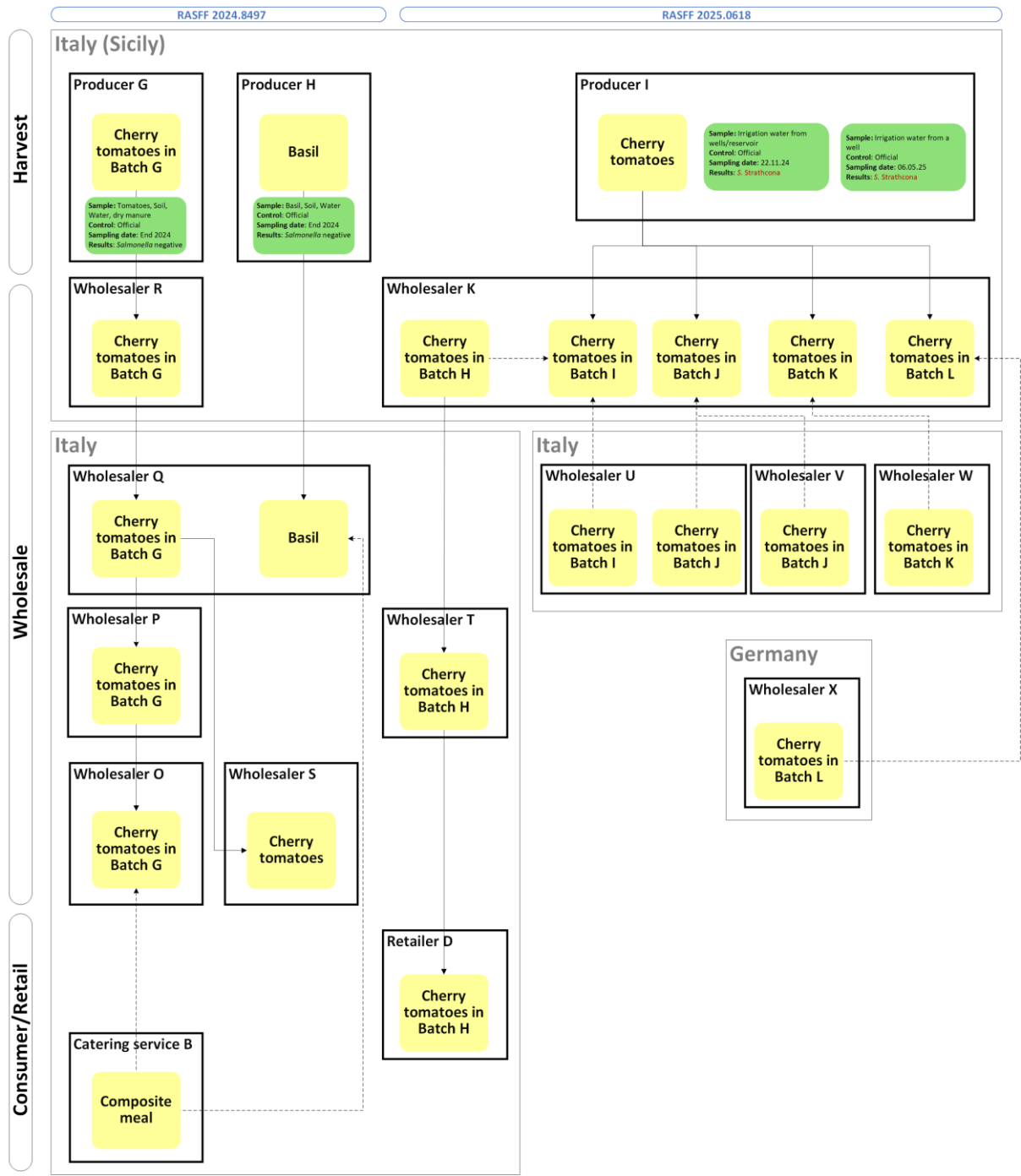
¹ Rapid outbreak assessment – Prolonged multi-country outbreak of *Salmonella* Strathcona ST2559 linked to consumption of tomatoes in the EU/EEA and the UK: <https://www.ecdc.europa.eu/en/publications-data/rapid-outbreak-assessment-prolonged-multi-country-outbreak-salmonella-strathcona>

Figure 1a and 1b. Graphical representation of the traceability of the suspected organic cherry tomatoes and microbiological investigations, as reported to RASFF by the involved countries (2011–2025)

1a



1b



RASFF: Rapid Alert System for Food and Feed. RASFF 2011.1630 refers to a historical outbreak that occurred in Denmark in 2011. Text in red indicates *Salmonella* Strathcona findings. Bold lines indicate newly identified operators.

European whole genome sequencing analysis of human and non-human isolates

Whole genome sequencing data collection and cross-sectoral analysis

Human isolates

In a cluster analysis of *S. Strathcona* isolate sequences collected in 2024 and 2025, ECDC identified a total of 144 human isolates within six allelic distances in a single linkage analysis. Nine countries are included in the cluster: Germany, France, Ireland, Italy, the Netherlands, Slovakia, Sweden, the UK and the US.

Non-human isolates

EFSA launched a call for data on 17 September 2025. EU Member States were invited to submit genomic information on *S. Strathcona* ST2559 isolates matching the representative outbreak strain to the EFSA WGS System. As of 13 October 2025, the EFSA WGS system contained 18 sequences of *S. Strathcona* non-human isolates shared by the EU countries (Italy: 14 isolates; Germany: three isolates; Austria: one isolate).

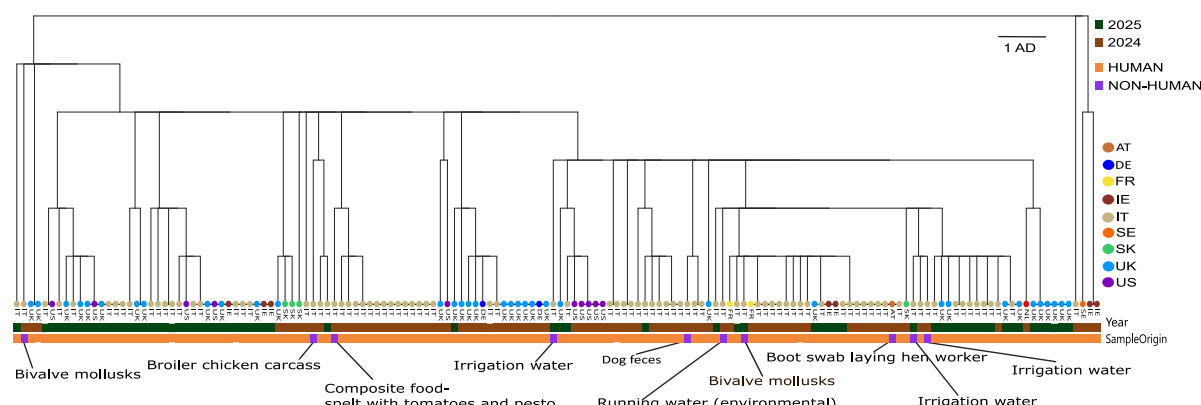
Details of the 18 isolates are set out below.

- Eight isolates derived from environmental samples:
 - three from sludge (collected in Germany in 2012, 2018 and 2022);
 - one from river water (collected in Italy in 2023);
 - one from running water (collected in Italy in 2024);
 - three from irrigation water (collected at the premises of the Italian Producer I (Sicily) in 2024 (Table 4) and in 2025).
- Four isolates derived from animal samples:
 - one from a wild boar organ (collected in Italy in 2022);
 - one from bovine faeces (collected in Italy (Sicily) in 2023);
 - one from dog faeces (collected in Italy in 2024);
 - one from a boot swab taken from a worker who owns a laying hen farm linked to the outbreak in Austria (collected in Austria in 2024).
- Six isolates derived from food samples:
 - four from bivalve molluscs (collected in Italy in 2020, 2023, 2024, 2025);
 - one from a composite food (spelt with tomatoes and pesto) sample (collected during the national outbreak in Tuscany, Italy in 2024);
 - one from a broiler chicken carcass (collected in Italy (Sicily) in 2024; Table 3).

For cross-sectoral analysis, the cgMLST analysis was performed at both ECDC and EFSA, as previously described [8]. Genome profiles were calculated from assembled genomes using [chewBBACA version ≥ 2.8.5](#) using the schema described by Rossi et al. 2018 [9] for *Salmonella enterica*, made available by chewie Nomenclature Server [10]. Isolates with more than 10% of missing loci (325 from a total of 3 255 loci) were excluded from the analysis.

Results of cross-sectoral whole genome sequencing analysis

ECDC queried the EFSA WGS system on 14 October 2025 using the cluster of *S. Strathcona* genomic profiles as reference and 10 allelic differences as the threshold. As a result of the query, and specifically for isolates reported in 2024 and 2025, a single linkage cluster totalling 154 isolates was created within six allelic differences (Figure 2).

Figure 2. Single-linkage cluster tree of 144 *S. Strathcona* ST 2559 human isolates (2024–2025) and 10 non-human isolates (2024–2025), by country, year and sample origin

The single-linkage cluster tree was created in the molecular typing tool in EpiPulse (cluster code: 2023-10.SALM.09.STRATHCONA), with data as of 14 October 2025 for sampling years 2024 and 2025.

ECDC and EFSA risk assessment for the EU/EEA

Since 1 January 2023 and as of 30 September 2025, 437 confirmed cases of *S. Strathcona* ST2559 have been identified in 17 EU/EEA countries: Austria (76), Croatia (3), Czechia (11), Denmark (12), Estonia (2), Finland (5), France (43), Germany (113), Ireland (6), Italy (123), Luxembourg (5), the Netherlands (5), Norway (4), Slovakia (6), Slovenia (10), Spain (3) and Sweden (10). In addition, 73 cases have been reported by the UK, ten cases by Canada and 24 cases by US.

Among the 379 cases for which age and gender data are available, females were more frequently affected than males. A total of 86 cases from the EU/EEA countries reported travel history within the incubation period. The most frequently visited country was Italy (57/86 cases; 66%). In addition, Canada reported seven of its ten confirmed cases as having a travel history to Europe during the period 2023–2025. Sixteen of 21 cases in the UK with travel history data in 2025 had also visited Italy.

Tomatoes remain the primary food vehicle in several investigations for this prolonged multi-country outbreak that includes cases spanning a three-year period (2023–2025), with reported consumption of tomatoes or a travel history to Italy.

The outbreak strain has been circulating in the EU/EEA since 2011, when a first historical outbreak was reported in Denmark, with small and elongated datterino tomatoes traded from Sicily (Italy) identified as the source of the infections. In 2025, the outbreak investigations carried out in Austria (epidemiological, microbiological and traceability investigations) identified the small tomatoes traded from Sicily (Italy) as the source of the infections, had been the case for the 2023 outbreak in Austria and the 2024 outbreak in Italy.

In response to the findings in this prolonged multi-country outbreak, comprehensive investigations were carried out by the food safety authority in Italy. These included an extraordinary sampling plan for nationally marketed tomatoes, including those harvested in Sicily, aiming to detect *Salmonella* (September–December 2024); an audit carried out by the Ministry of Health to verify compliance with the EU legislation and the effectiveness of the official controls in Sicily (November 2024); target samplings by the local authorities at the premises of the tomato producers involved in Sicily as a response to the Tuscany and Umbria outbreaks (December 2024); and extra samplings and further official controls (2025).

The detection of *S. Strathcona* from a sample of irrigation water (well water) collected at a primary production site (a tomato producer in Sicily) confirmed the role of the environment in the contamination of tomatoes. This tomato producer was identified after detection of *Salmonella* (serovar Infantis) in a sample of its marketed tomatoes which had been collected during the national sampling plan. Furthermore, these microbiological findings suggest that inadequate microbiological quality of irrigation water can serve as a direct source of contamination, and that stricter controls are needed on water sources for agriculture water.

These findings also highlighted the need for a multi-disciplinary strategy to mitigate the risk of contamination with *Salmonella*. This need is also confirmed by the detection of the outbreak strain in other matrices connected with the aquatic environments (e.g. river, bivalve molluscs, running water, irrigation water).

Further investigations should continue to verify the hypothesis that small tomatoes from Sicily are the vehicle of the newly-reported infections in all countries, as other foods could also be involved in the transmission.

Finally, a proper microbiological risk assessment should be conducted at the primary production level – (pre)-harvest level – including irrigation water sources for the implementation of effective corrective measures.

The detection of *Salmonella* in one sample of the several tomato samples collected highlights the challenge with the detection of *Salmonella* from this type of matrix, both at production and retail level, probably due to the

uneven distribution and low occurrence of the pathogen. The EU Reference Laboratory for *Salmonella* confirmed that the normal procedure for sample preparation of 'one type of fruit or vegetable' (clause 9.7.2 of EN ISO 6887-4:2017) works properly for the preparation of tomato samples, after which the normal procedure for detection of *Salmonella* can be followed (EN ISO 6579-1). More details can be found in the EURL *Salmonella* document on *Salmonella* detection in/on tomatoes: <https://www.eurlsalmonella.eu/en/methods/specific-products>.

To address microbiological hazards such as *Salmonella*, the primary objective of operators producing tomatoes should be the appropriate implementation of food safety management systems, including Good Agricultural Practices (GAP), Good Hygiene Practices (GHP) and Good Manufacturing Practices (GMP) [11]. Irrespective of their size, growers at primary production sites are encouraged to follow the guidance [Commission Notice 2017/C 163/01] and apply the hygiene requirements for the production and handling of fresh fruit and vegetables in a correct and uniform manner, in conjunction with other relevant national, EU, and international legislation and standards.

Recommendations

- **Public health authorities** are encouraged to:
 - Conduct a case-control study and patient interviews if new *S. Strathcona* ST2559 cases are identified. Small tomatoes should be considered as a likely vehicle of infection.
 - Sequence human isolates of *S. Strathcona*, if possible, and share them in the ECDC WGS system. ECDC can offer sequencing support to countries with limited or no capacity.
 - Update the EpiPulse event 2023-FWD-00090, should new cases of *S. Strathcona* ST2559 be reported.
 - Work closely with food safety authorities on national investigations if new *S. Strathcona* ST2559 cases are identified.
- **Food safety authorities** are encouraged to:
 - Share in the EFSA WGS system any sequences of *S. Strathcona* ST2559 food and environmental isolates linked to the present cluster, either microbiologically (serotype or sequence type) or epidemiologically (e.g. suspected food items reported by patients) and share in RASFF the traceability information related to the foods these sequences were derived from.
 - Submit genomic data of other *S. Strathcona* isolates from any kind of food, feed, animal or environmental samples to the EFSA WGS System.
- **Consumers** are encouraged to follow proper hygiene practices at home, including handwashing, rinsing fresh produce and avoiding cross-contamination (e.g. by keeping raw and cooked foods separate).

Source and date of request

The European Commission sent a request to EFSA on 12 September 2025 to produce an update of joint rapid outbreak assessment (ROA). EFSA sent a request to ECDC on the same day. ECDC accepted the request on 17 September 2025.

Consulted experts and national contact points

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Finland: Ruska Rimhanen-Finne and Anni Vainio (National Institute for Health and Welfare (THL)).

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The UK: Ann Hoban (UK Health Security Agency)

The US: Morgan Schroeder (US CDC).

National experts consulted by the RASFF contact points

RASFF contact points were consulted in Austria, Germany, and Italy.

Italy: Valentina Cambiotti and Fabrizio Lazzara (Italian Ministry of Health), and Lisa Barco, Giulia Baggio, Laura Bortolami and Angelo Sardella (Italian National Reference Laboratory for *Salmonella*, Istituto Zooprofilattico Sperimentale delle Venezie).

Country Officers of the EFSA WGS system

Country Officers of the EFSA WGS system were consulted in Italy.

Disclaimer

This rapid outbreak assessment was written jointly by the European Centre for Disease Prevention and Control (ECDC) and the European Food Safety Authority (EFSA).

ECDC issued this outbreak assessment document in accordance with Article 20 of Regulation (EU) 2022/2371 on serious cross-border threats to health, Articles 7(1) and 8a of Regulation (EC) No 853/2004 establishing a European Centre for Disease Prevention and Control. EFSA's contribution is based on a mandate from the European Commission requesting EFSA to provide scientific assistance in the investigation of multinational food-borne outbreaks (Ares (2013) 2576387, Mandate M-2013-0119, 4 July 2013) in accordance with Article 31 of Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002, laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety.

The specific purpose of an ECDC-EFSA rapid outbreak assessment is to present an analysis of a cross-border food-borne threat to health and to provide science-based recommendations and options for response. The responsibility for the choice of which options to pursue and which actions to take at the national level lies with EU/EEA countries.

All data published in this rapid outbreak assessment were collected by the EU/EEA countries affected by the outbreak up to the date on which this assessment was produced. Maps and figures do not represent statements by ECDC or EFSA on the legal or border status of the countries and territories shown, but represent the information that this rapid outbreak assessment is based on.

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Annex 1. Traceability investigations and control measures implemented, by country

The following sections describe the updates on the traceability investigations performed by the countries involved in this EU multi-country outbreak of *Salmonella* Strathcona, as reported in RASFF after the publication of the first ROA on 12 November 2024².

2023-FWD-00090 and RASFF 2024.0384 and 2024.7763

Austria

Further outbreak investigations carried out in Austria

Following the 2024 *S. Strathcona* national outbreak investigation, the food safety authority in Austria reported the following in RASFF on 7 October 2025 (*fup25*, 2024.0384): Seven members of the same family fell ill simultaneously with symptoms consistent with a *Salmonella* infection after having consumed on 11 August 2025 small red tomatoes purchased at the Austrian Retailer A. The small red tomatoes were supplied between 2 August and 9 August 2025. The tomatoes originated from Italy (Sicily) and Spain. According to the food safety authority, the supplier is the Italian Supplier A (already involved in the previous ROA). The food safety authority will contact the headquarters of the Austrian Retailer A to initiate the discontinuation of imports of small tomatoes from this supplier (*fup25*, 2024.0384).

Italy

Traceability details and further food investigations related to the outbreak in Austria

As part of the 2024 *S. Strathcona* national outbreak investigation, the food safety authority in Austria requested the assistance of the food safety authority in Italy due to 2024 cases with travel history to Italy (*fup18* and *fup19*, 2024.0384). The food safety authority in Italy contacted the hotels visited by the Austrian patients. In one of the two cases, the authority could trace the suspected cherry tomatoes consumed back to wholesalers (*fup19*, 2024.0384) that had sourced the cherry tomatoes from the Italian Producer K, located in Sicily (*fup20*, 2024.0384). At the time of the inspections, tomato production had ceased. However, the food safety authority ordered testing of the irrigation water, soil, and fertiliser used at the production plant for *S. Strathcona* (*fup20*, 2024.0384). The results of sampling carried out on 22 November 2024 did not detect *Salmonella* (*fup22*, 2024.0384).

Traceability details and further food investigation updates related to the outbreak in Tuscany

The national investigations in Tuscany on the outbreak caused by *Salmonella* which occurred in some schools led to the detection of *S. Strathcona* from a composite meal (spelt with tomatoes and pesto) with cherry tomatoes as the common suspected ingredient in the meals consumed by the patients (2024.7763). The traceback investigations carried out by the food safety authority in Italy identified two tomato producers (Italian Producer C and Italian Producer D).

On 6 November 2024, the food safety authority in Italy shared the outcome of further investigations. The official controls carried out at the premises of the Italian Producer D did not identify any non-conformities at the plant (*fup4*, 2024.7763). During the inspection, the tomatoes from the greenhouse were sampled. Tomatoes were collected directly from the crop and microbiological analysis yielded a negative *Salmonella* result (*fup6*, 2024.7763). In December 2024, two official samples of irrigation water were also collected and these tested negative for *Salmonella* (*fup6*, 2024.7763).

Traceability details and further food investigations related to the national sampling plan

In early December 2024, as part of the national sampling plan, four producers of tomatoes located in Sicily (Producer C, Producer F, Producer J, and Producer E) were inspected (#722903, 2024.7763) and samples were taken (*fup7*, 2024.7763). Details are available in Table 1. *S. Braenderup* was isolated from one water sample collected at the premises of Producer F from an irrigation tube carrying the water from the well to the greenhouse. The food safety authority prohibited the use of the water from the positive irrigation tube until appropriate corrective measures had been taken by Producer F (*fup7*, 2024.7763). The food safety authority reported that the new water samples collected on 15 April 2025 at the premises of Producer F yielded a negative *Salmonella* result (*fup8*, 2024.7763).

On 7 May 2025, the authority reported that the soil samples taken at the Italian Producer J and the Italian Producer E tested negative for *Salmonella* (*fup8*, 2024.7763), as well as the soil samples and fertiliser samples taken at the premises of Producer F and Producer C.

On 27 May 2025, the food safety authority reported that the precautionary measures had been implemented by the Italian Producer J and the Italian Producer E concerning the well irrigation water. Testing revealed no *Salmonella* detection and *E. coli* detected was within the acceptable limit (#765994, 2024.7763).

² Rapid outbreak assessment – Prolonged multi-country outbreak of *Salmonella* Strathcona ST2559 linked to consumption of tomatoes in the EU/EEA and the UK: <https://www.ecdc.europa.eu/en/publications-data/rapid-outbreak-assessment-prolonged-multi-country-outbreak-salmonella-strathcona>

2023-FWD-00090 and RASFF 2024.8497

Italy

Traceability details and further food investigation updates related to the outbreak in Umbria

The national investigations in Italy (Umbria region) into the 2024 outbreak caused by *S. Strathcona* and involving a catering facility (Catering Service B) and some schools indicated the consumption of a composite meal (pasta salad with tomatoes and basil) as origin of the infections. The traceback investigations revealed that the cherry tomatoes used as ingredient originated from the Italian Producer G (*fup2*, 2024.8497) which is located in Sicily, Italy.

The catering facility (Catering Service B) had received the cherry tomatoes (Batch G) from the Italian Wholesaler O via the Italian Wholesaler P and the Italian Wholesaler Q (RASFF 2024.8497). The Italian Wholesaler Q sourced the cherry tomatoes in September 2024 from the Italian Wholesaler R, which purchased the cherry tomatoes from the Italian Producer G (*fup2*, *fup4*, 2024.8497). The Italian Wholesaler Q distributed the cherry tomatoes within Italy (Wholesaler S) (*fup2*, 2024.8497).

A second ingredient (basil) was also investigated and the traceback analysis identified the Italian Producer H as its origin. The Italian Producer H had delivered the basil to the Italian Wholesaler Q and is located in Sicily, Italy (*fup2*, *fup4*, 2024.8497).

The food safety authority carried out official controls at the two primary producers that had grown the cherry tomatoes, and the basil used as ingredients in the composite meal (pasta salad with tomatoes and basil). In November 2024, the authority ordered that the Italian Producer G should carry out its own tests for *S. Strathcona* on the water used for irrigation, the fertiliser and the soil. Tomatoes could not be sampled as the production had ceased (*fup2*, 2024.8497). By this time, basil production at the Italian Producer H had already ceased and therefore samples could not be taken (*fup2*, 2024.8497).

On 6 October 2025, the authority reported in RASFF that the samples of tomatoes, soil, organic fertiliser, and irrigation water, collected on 2 December 2024 during an official control at the premises of the Italian Producer G, tested negative for *Salmonella*. On the same date, samples of basil, soil, and irrigation water were collected at the premises of the Italian Producer H and these tested negative for *Salmonella* (*fup5*, 2024.8497).

RASFF 2025.0618

Italy

On 15 November 2024, the food safety authority in Italy issued an RASFF notification (information notification 2025.0618) to report the presence of *Salmonella* Infantis in cherry tomatoes originating from Sicily. The tomatoes originated from the Italian Producer I. The cherry tomatoes belonging to Batch H had been sampled during an official control at the premises of the Italian Retailer D on 4 November 2024.

The Italian Retailer D sourced the positive batch of cherry tomatoes (Batch H) from the Italian Wholesaler T. The Italian Wholesaler T received the cherry tomatoes from Italian Wholesaler K which assigned the batch number Batch H (#727023, 2025.0618).

Batch H was part of a larger batch of tomatoes sourced by the Italian Wholesaler K from the Italian Producer I and distributed to other operators – to the Italian Wholesaler T and the Italian Wholesaler U as Batch I; to the Italian Wholesaler U and the Italian Wholesaler V as Batch J; to the Italian Wholesaler W as Batch K and to the German Wholesaler X as Batch L. The food safety authority also reported that the Italian Wholesaler T distributed the same batch (Batch H) to other food business operators (#727023, *fup11*, 2025.0618).

An official control was carried out at the premises of the Italian Producer I, as reported by the food safety authority in Italy on 25 November 2024. Seven official samples of irrigation water and tomatoes were collected (#727501, 2025.0618). Irrigation water samples previously collected (on 18 November 2024) by the Producer as part of its own check tested negative for *Salmonella* (#729246, 2025.0618). On 29 January 2025, the food safety authority reported that three of the seven official irrigation water samples collected had tested positive for *Salmonella* (*fup3*, 2025.0618). The food safety authority prohibited the use of the wells (#734312, 2025.0618). The serovars identified were *Salmonella* Strathcona, *Salmonella* Cerro and *Salmonella* enterica subsp. salamae 41:z10:1,2 (*fup7*, 2025.0618). All cherry tomato samples tested negative.

Following the positivity of the three water samples, the Italian Producer I implemented corrective measures, including a monthly own check sampling of the irrigation water and the tomatoes for the detection of *Salmonella* spp. and *E. coli*. The samples taken at the premises of the Italian Producer I tested negative for *Salmonella* spp. and *E. coli* (*fup4*, *fup5*, *fup8*, 2025.0618).

On 15 April 2025, the food safety authority carried out another official sampling to evaluate the effectiveness of the corrective measures implemented by the Italian Producer I. *Salmonella* was detected in a sample of irrigation water. The authority prohibited the use of the irrigation well (*fup8*, 2025.0618). On 6 May 2025, this isolate was confirmed to be *S. Strathcona* matching the outbreak strain (2023-FWD-00090) (*fup9*, *fup10*, 2025.0618). As a control measure, the authority prolonged the prohibition of the use of the irrigation well.

Additional official samples of cherry tomatoes at the premises of the Italian Producer I were taken on 21 May 2025 and tested negative for *Salmonella* (*fup9*, 2025.0618).

Food-borne outbreaks caused by *S. Strathcona*

Country-specific data on food-borne outbreaks are reported to EFSA by countries in accordance with the Zoonoses Directive 2003/99/EC. Overall, two strong-evidence and six weak-evidence foodborne outbreaks caused by *S. Strathcona* have been reported in the EU/EEA (2019–2023). Among the strong-evidence outbreaks, there were 71 human cases, 21 hospitalisations, and no deaths reported. The outbreaks were reported in 2023 by Austria and Germany. The reported food vehicles were 'Foods of non-animal origin'. Among the weak evidence outbreaks there were 56 human cases, 20 hospitalisations, and no deaths reported. The outbreaks were reported by Denmark (three outbreaks, in 2020, 2022, and in 2023), France (one outbreak in 2020) and Italy (two outbreaks, in 2019 and 2021). The reported food vehicles were 'Foods of non-animal origin', 'Milk and milk products', 'Meat and meat products' and 'Unknown'.

Occurrence of *S. Strathcona* in food

Country-specific data on the occurrence of *S. Strathcona* is reported to EFSA by countries in accordance with the Zoonoses Directive 2003/99/EC. For all matrices (food, feed and animals) up to 2023, one EU Member State (Italy) reported one total unit tested for the matrix 'Deer - wild - fallow deer', which tested positive for *S. Strathcona* in 2022.