

# Results of Zoonosen-Monitoring 2022

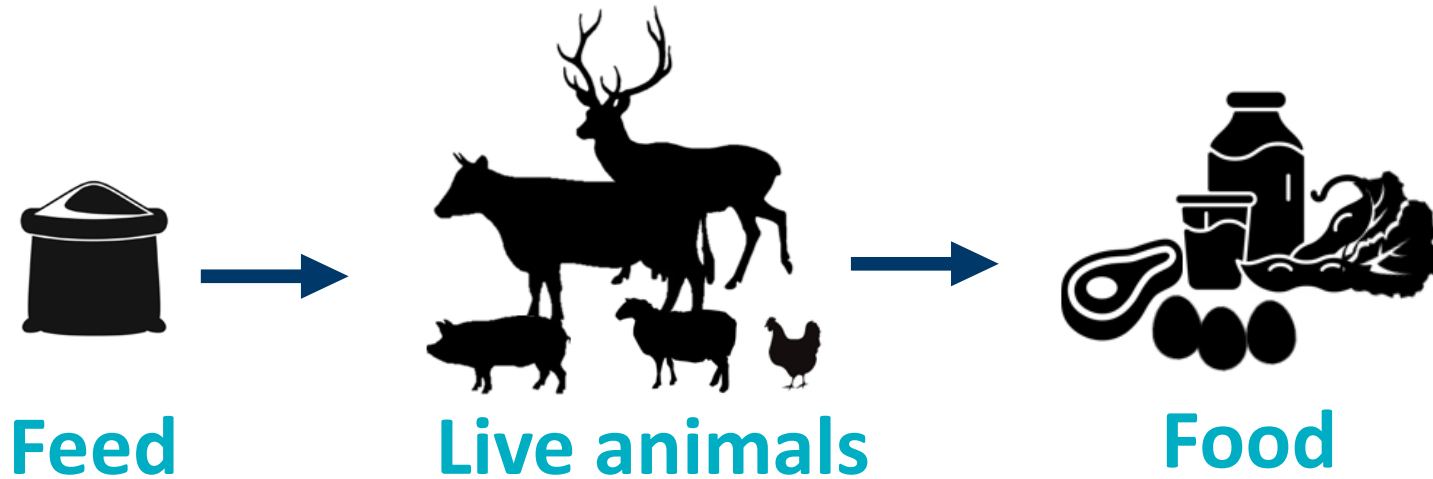
16.11.2023, Symposium Zoonosen und Lebensmittelsicherheit

**C. Plaza-Rodriguez, B.-A. Tenhagen**

Unit Epidemiology, Zoonoses and Antimicrobial Resistance

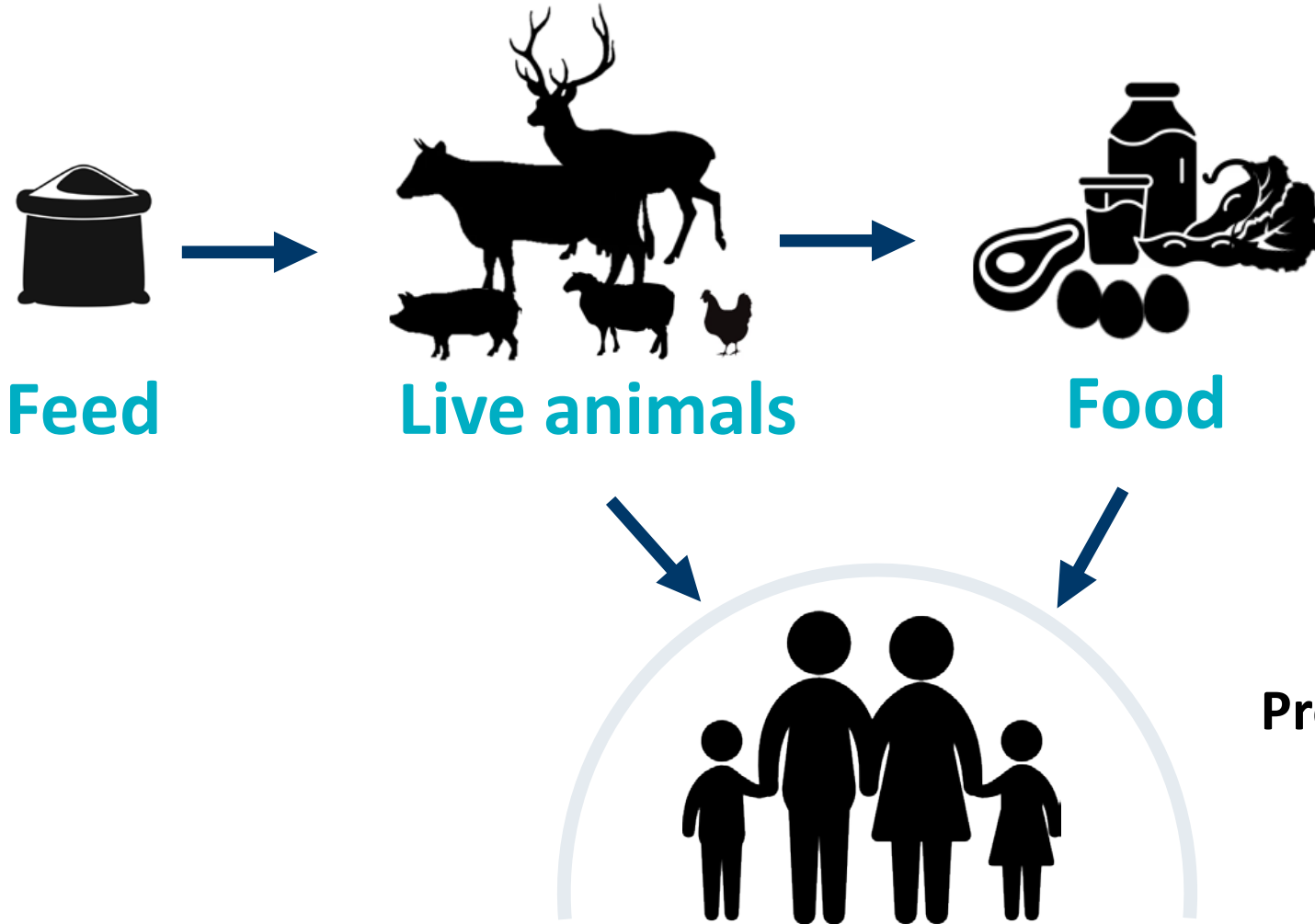
Department Biological Safety

# National Zoonoses Monitoring Presence of zoonotic pathogens



- ❖ Development of trends: zoonoses and zoonotic pathogens
- ❖ Emerging zoonotic pathogens
- ❖ Monitor antimicrobial resistance situation

# National Zoonoses Monitoring Presence of zoonotic pathogens



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# AVV Zoonosen Lebensmittelkette

Based on EU Directive 2003/99/EC

CID 2020/1729/EC (2021 - 2027)

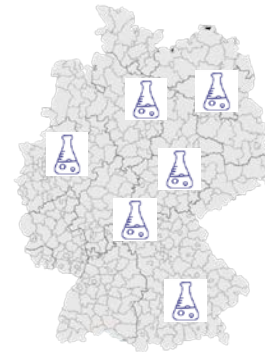


## 1. Proposals for specific programs

## 2. Consultation with the Federal States

## 3. Zoonoses sampling plan:

- Zoonotic agent
- Animal populations
- Stages of the food chain
- Number of samples
- Sampling procedures
- Analytical methods



# German Zoonoses Monitoring 2022



CID 2020/1729/EC (2021 - 2027)

Broilers					
Turkeys					
Ducks					
Others					
	Primary production	Slaughterhouse	Manufacturer and packer	Retail	Border control posts
					Nature

## Pathogenic Bacteria

- *Campylobacter* spp.
- *Salmonella* spp.
- *Enterococcus* spp.
- *Listeria monocytogenes*
- Präsumtive *Bacillus cereus*

## Commensal bacteria

- *E. Coli*

## Multi-resistant bacteria

- Methicillin-resistant *Staphylococcus aureus* (MRSA)
- ESBL/AmpC-*E. coli*
- Carbapenemase-*E. coli*

## Parasites

- *Baylisascaris procyonis*
- *Echinococcus* spp.

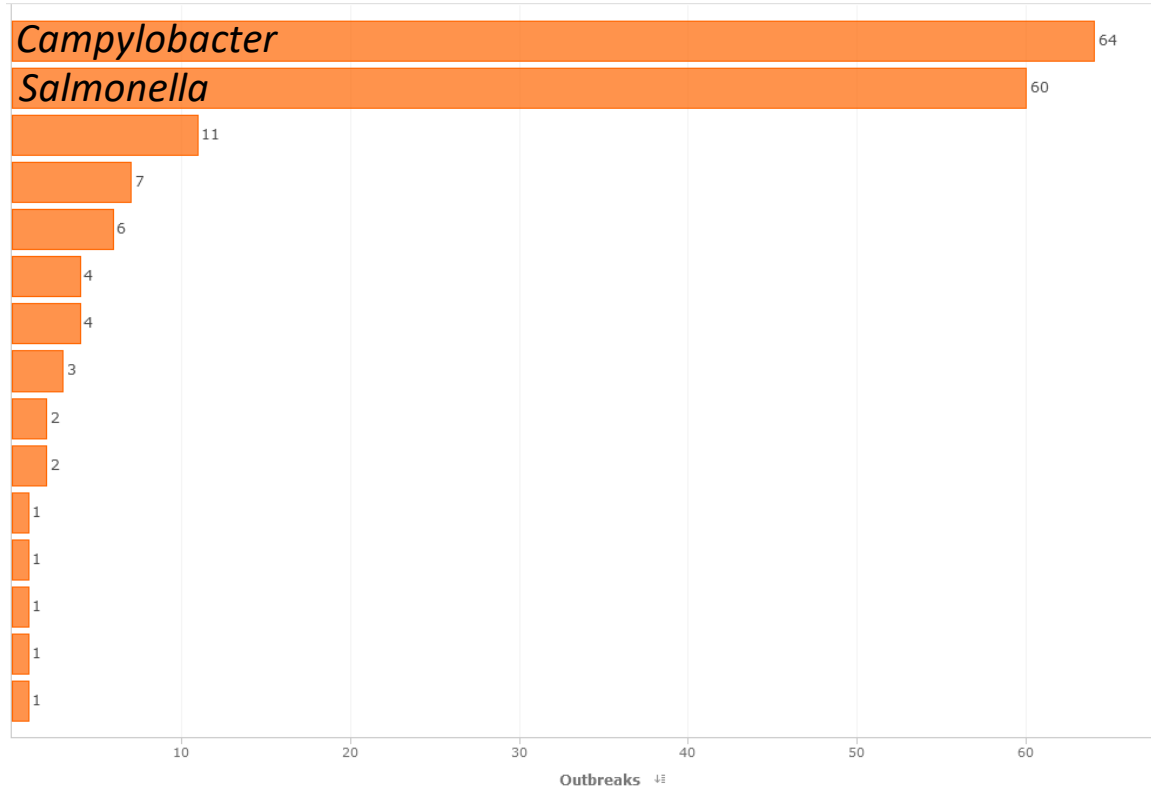
## Virus

- Hepatitis-E-Virus

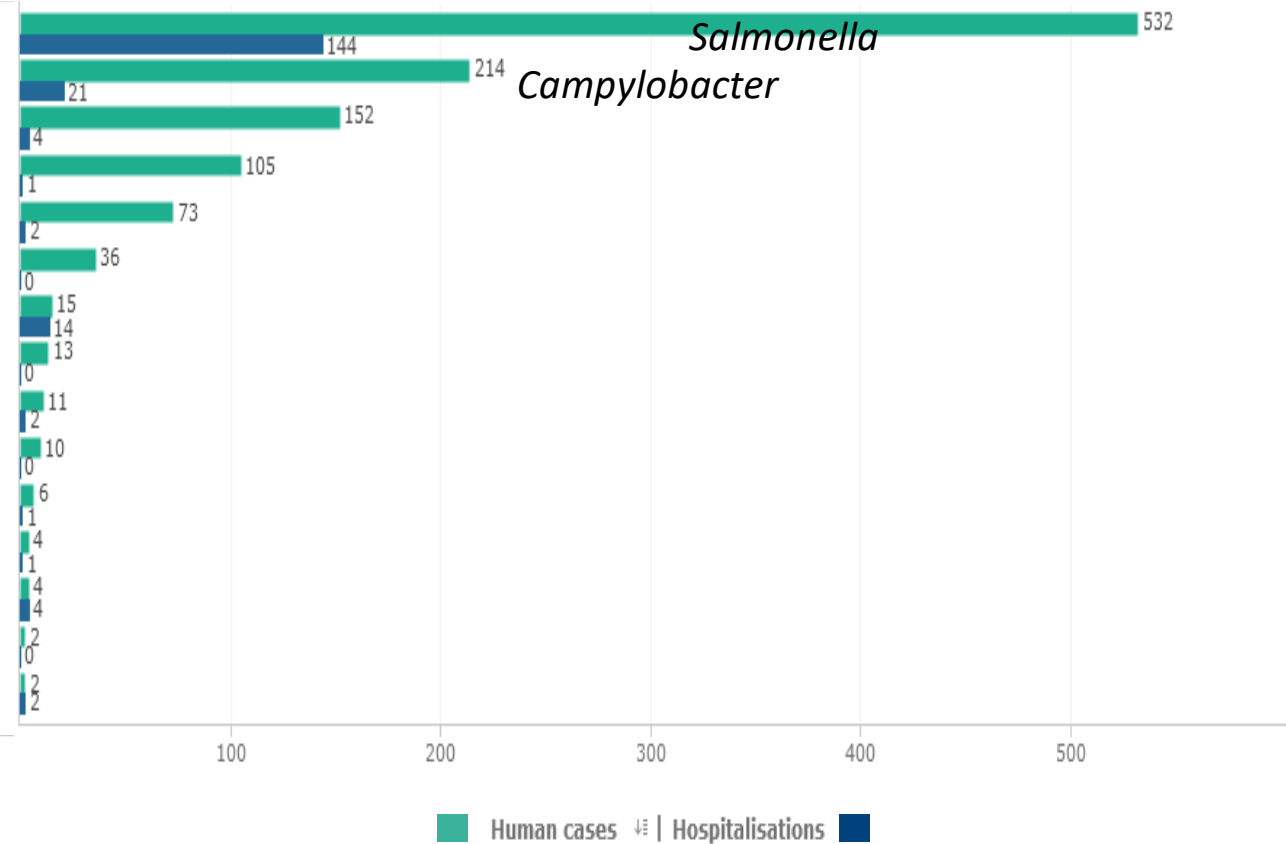
- Prevalence
- Typification
- Antimicrobial resistance

# Data from Germany 2021

Number of outbreaks by causative agents



Number of human cases and hospitalisations by causative agent












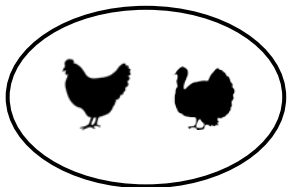

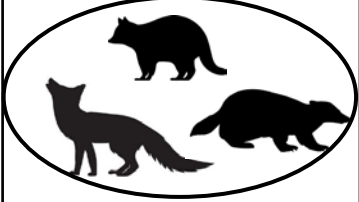


<https://www.efsa.europa.eu/en/microstrategy/FBO-dashboard>

# German Zoonoses Monitoring 2022

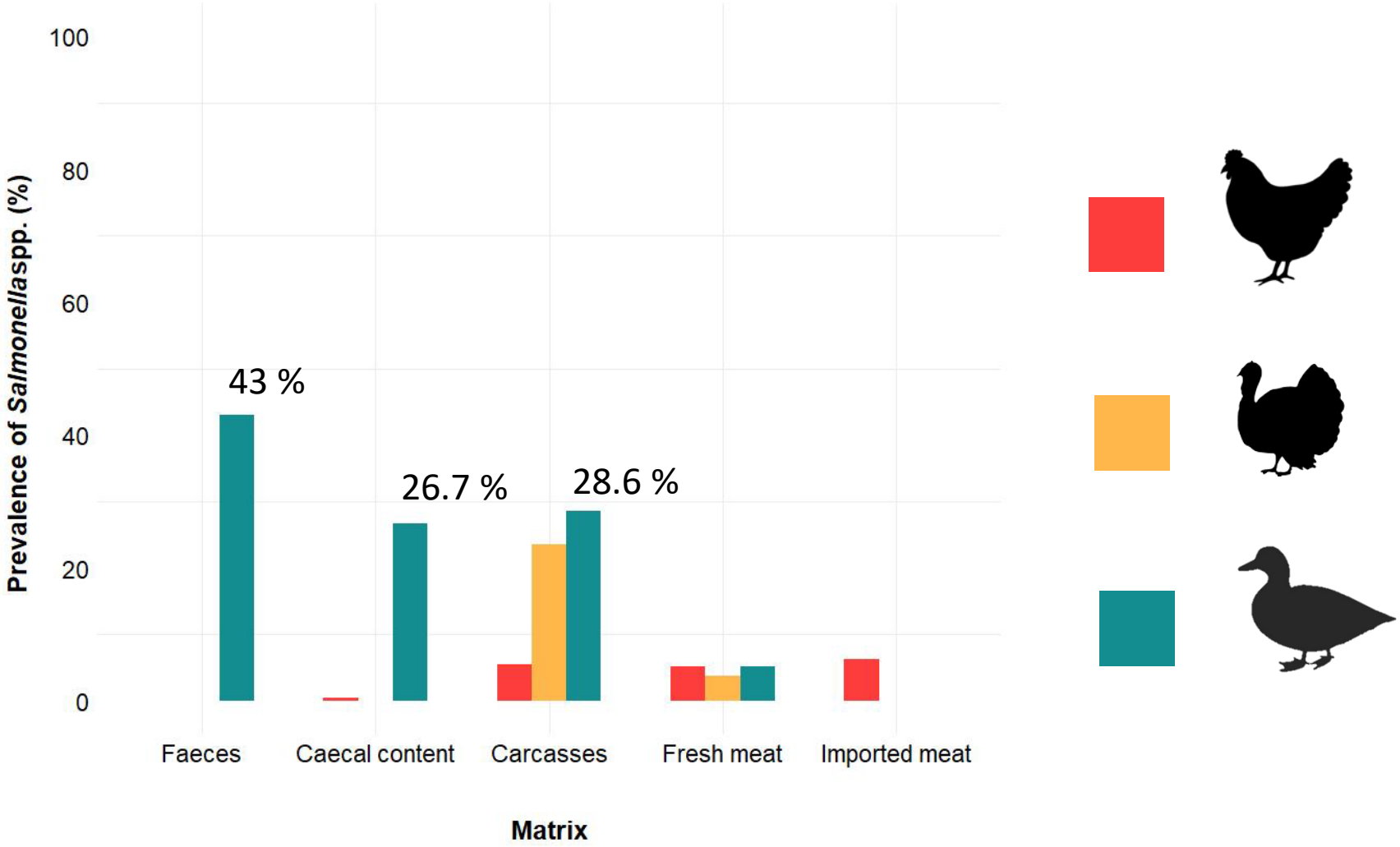


CID 2020/1729/EC (2021 - 2027)

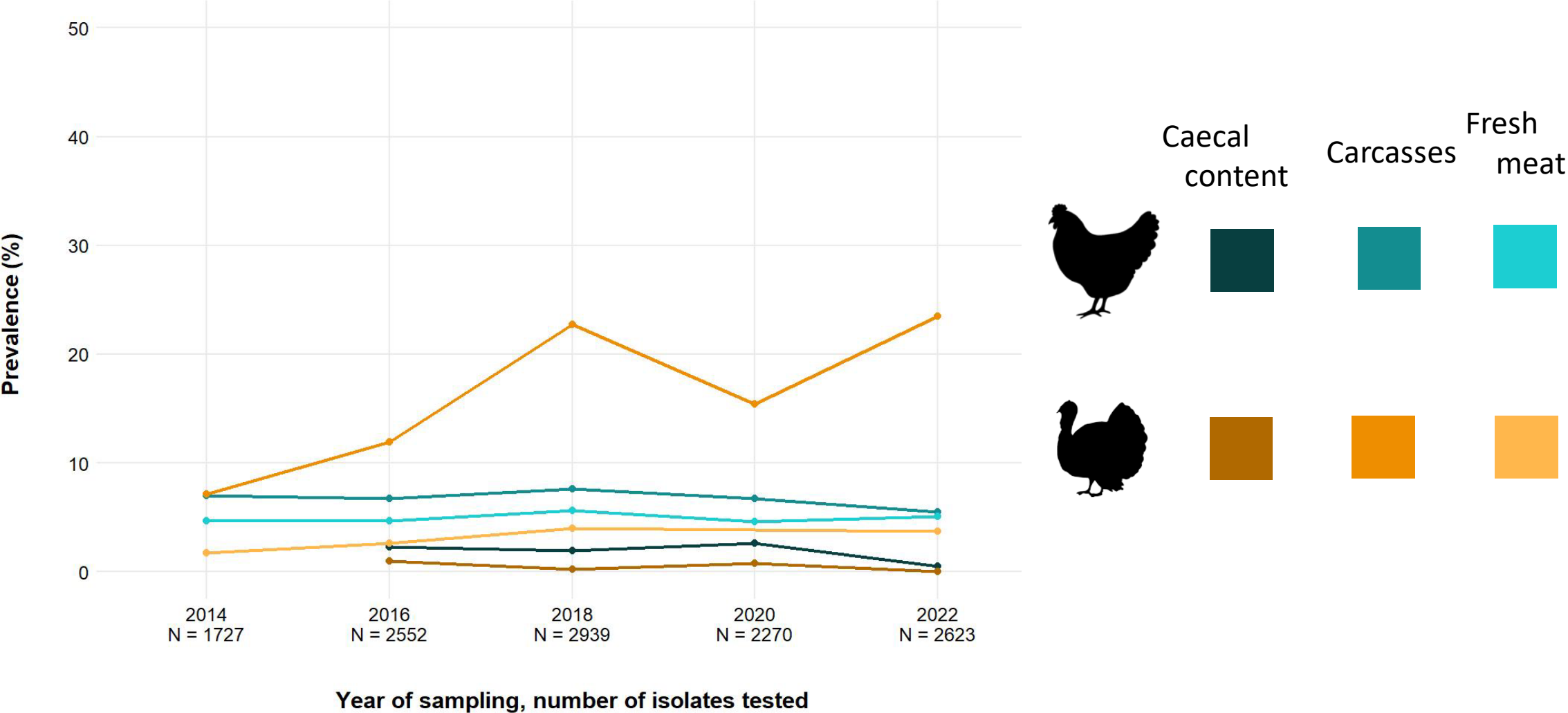
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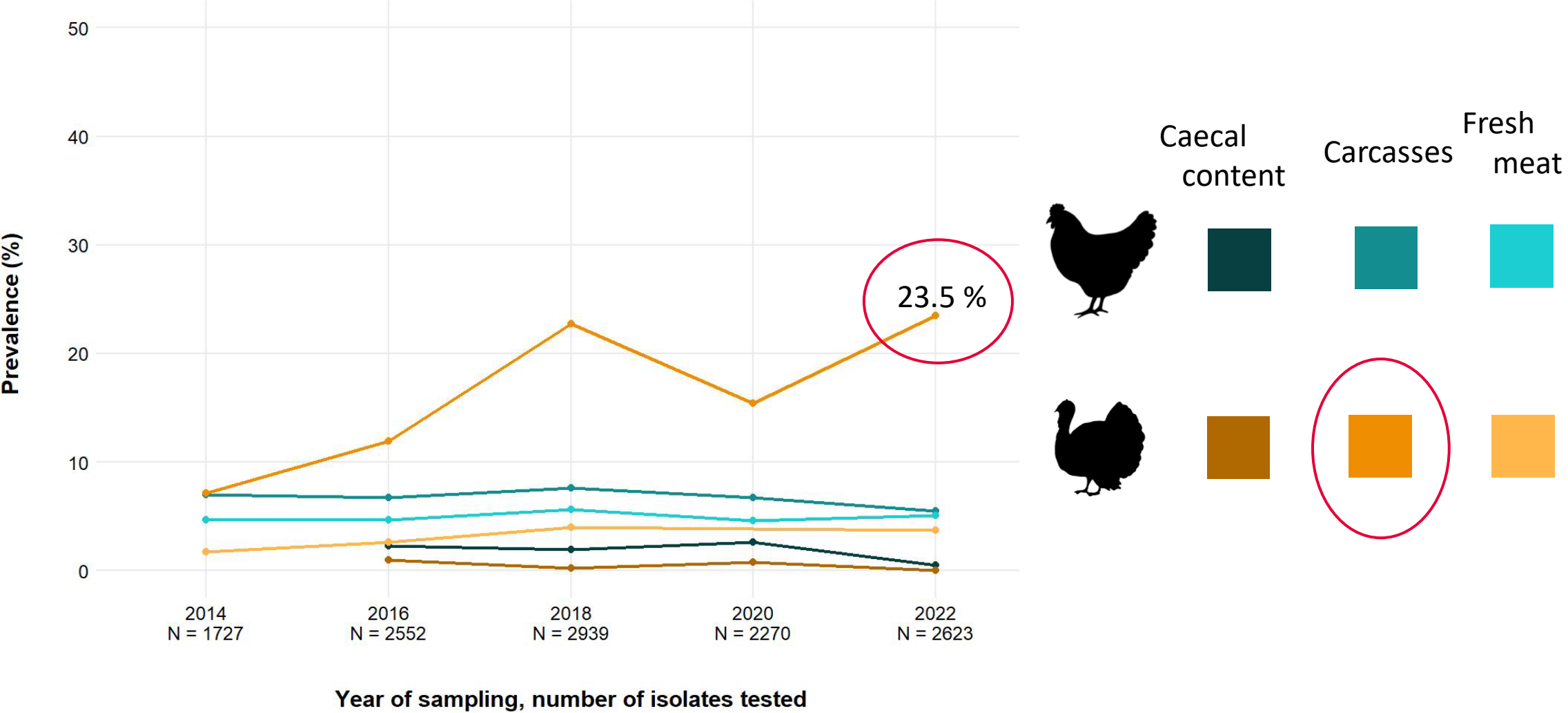
# Zoonoses Monitoring 2022: *Salmonella* spp.



# Zoonoses Monitoring 2014 - 2022: *Salmonella* spp.

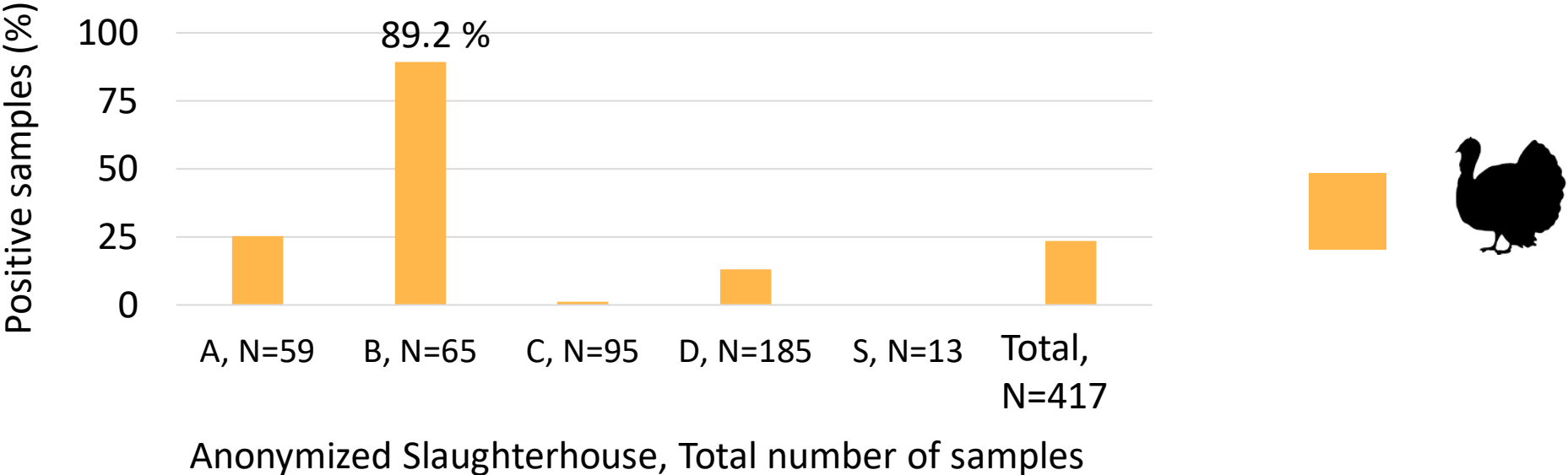


# Zoonoses Monitoring 2014 - 2022: *Salmonella* spp.



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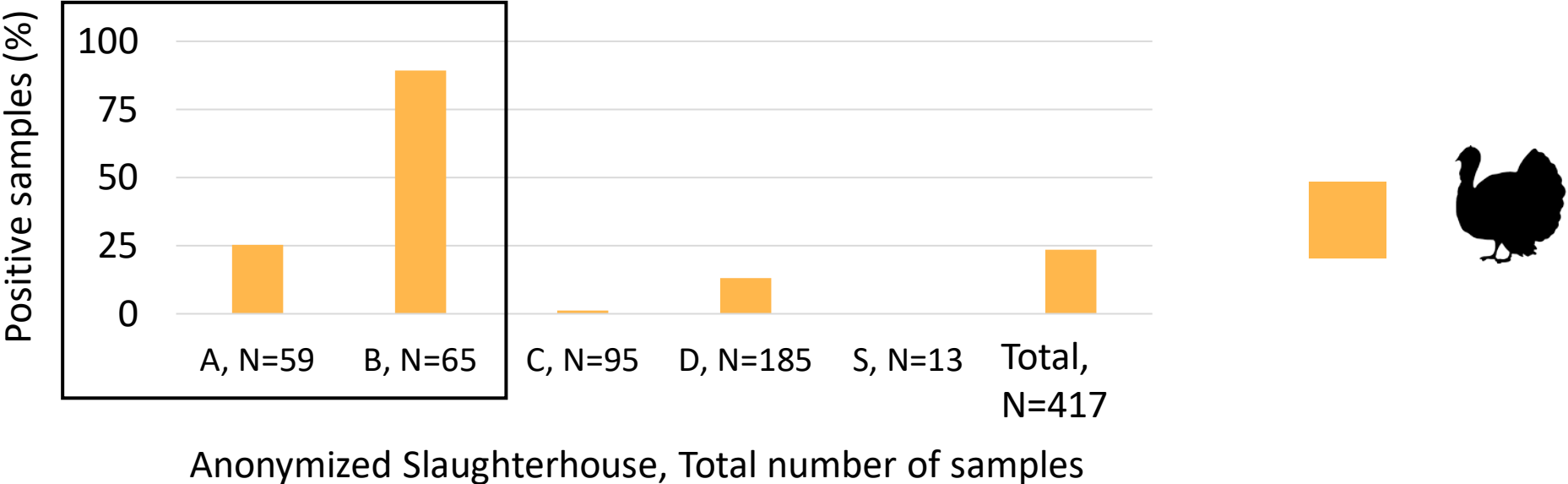
*Salmonella* spp. in carcasses from individual slaughterhouses



## Process hygiene criteria Regulation (EC) No 2073/2005

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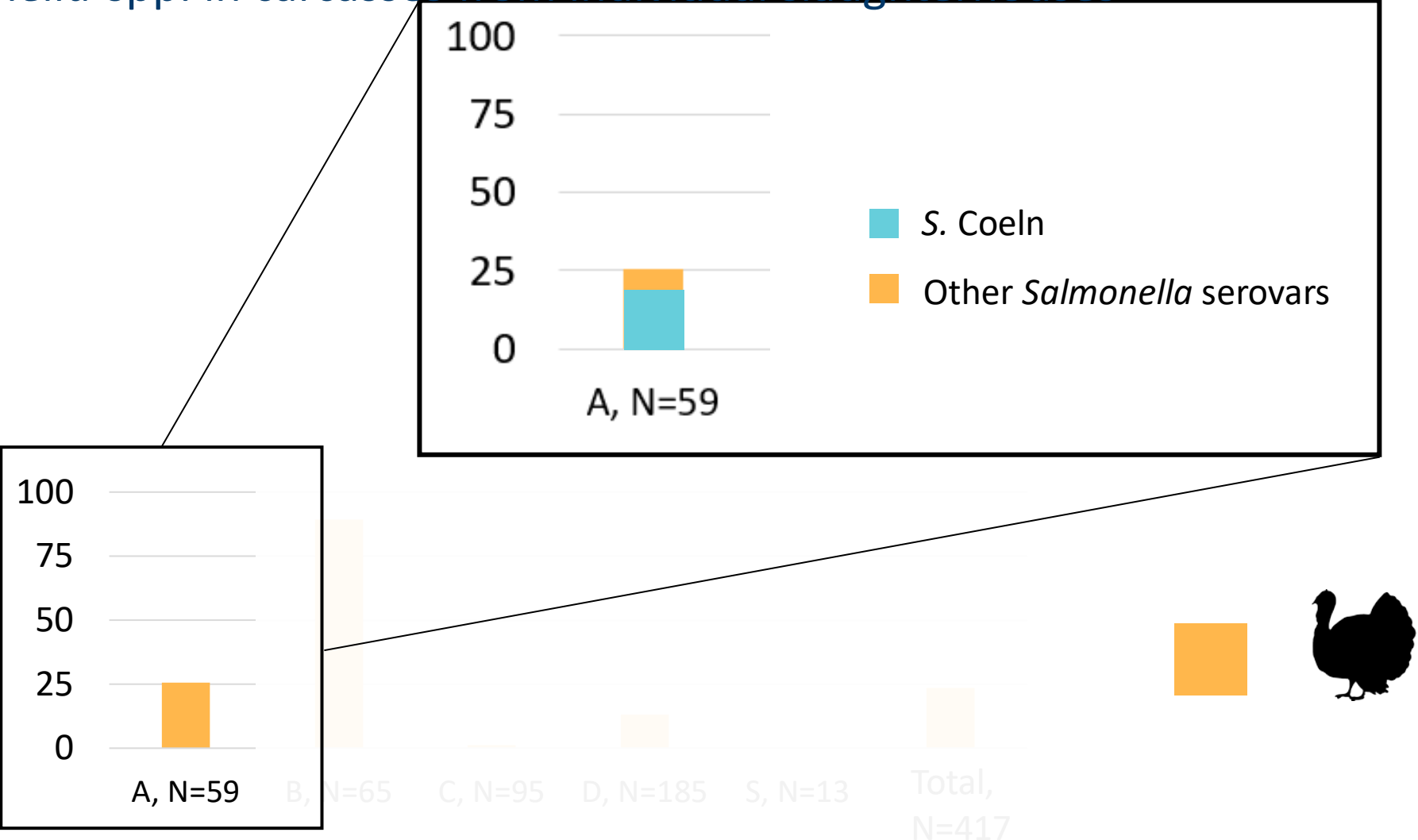
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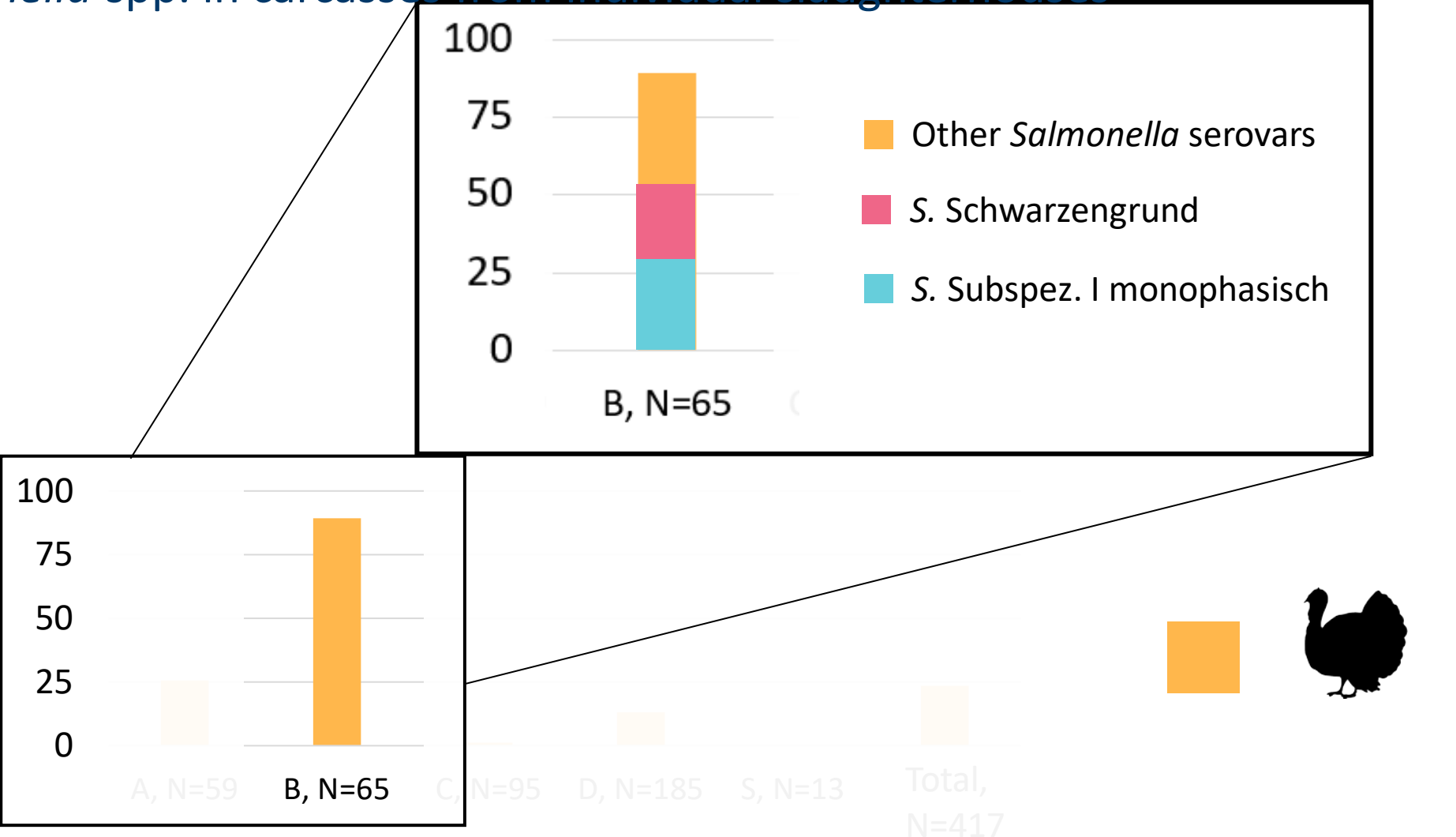
# Zoonoses Monitoring 2022:

## Salmonella spp. in carcasses from individual slaughterhouses



# Zoonoses Monitoring 2022:

## Salmonella spp. in carcasses from individual slaughterhouses



# Zoonoses Monitoring 2022: typification of *Salmonella* spp.



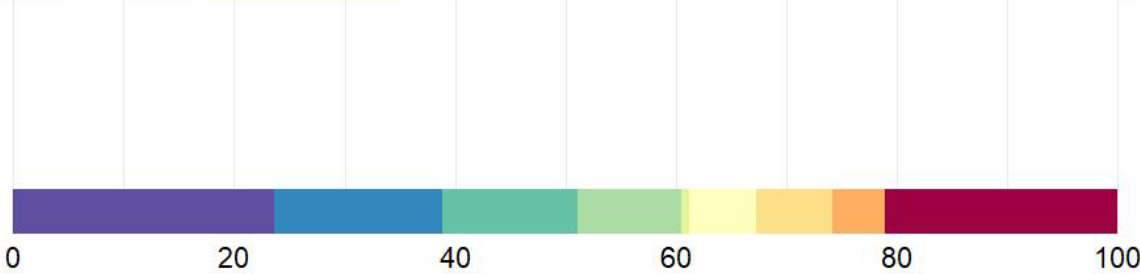
N = 54



N = 119



N = 309



- S. Meleagridis
- S. Hadar
- S. Senftenberg
- S. Newport
- S. Infantis
- S. Indiana
- S. Typhimurium
- S. Enteritidis
- S. Subsp. I monophasisch
- S. Stanleyville
- other Salmonella serovars

Percentage of isolates (%)



# Zoonoses Monitoring 2022: typification of *Salmonella* spp.



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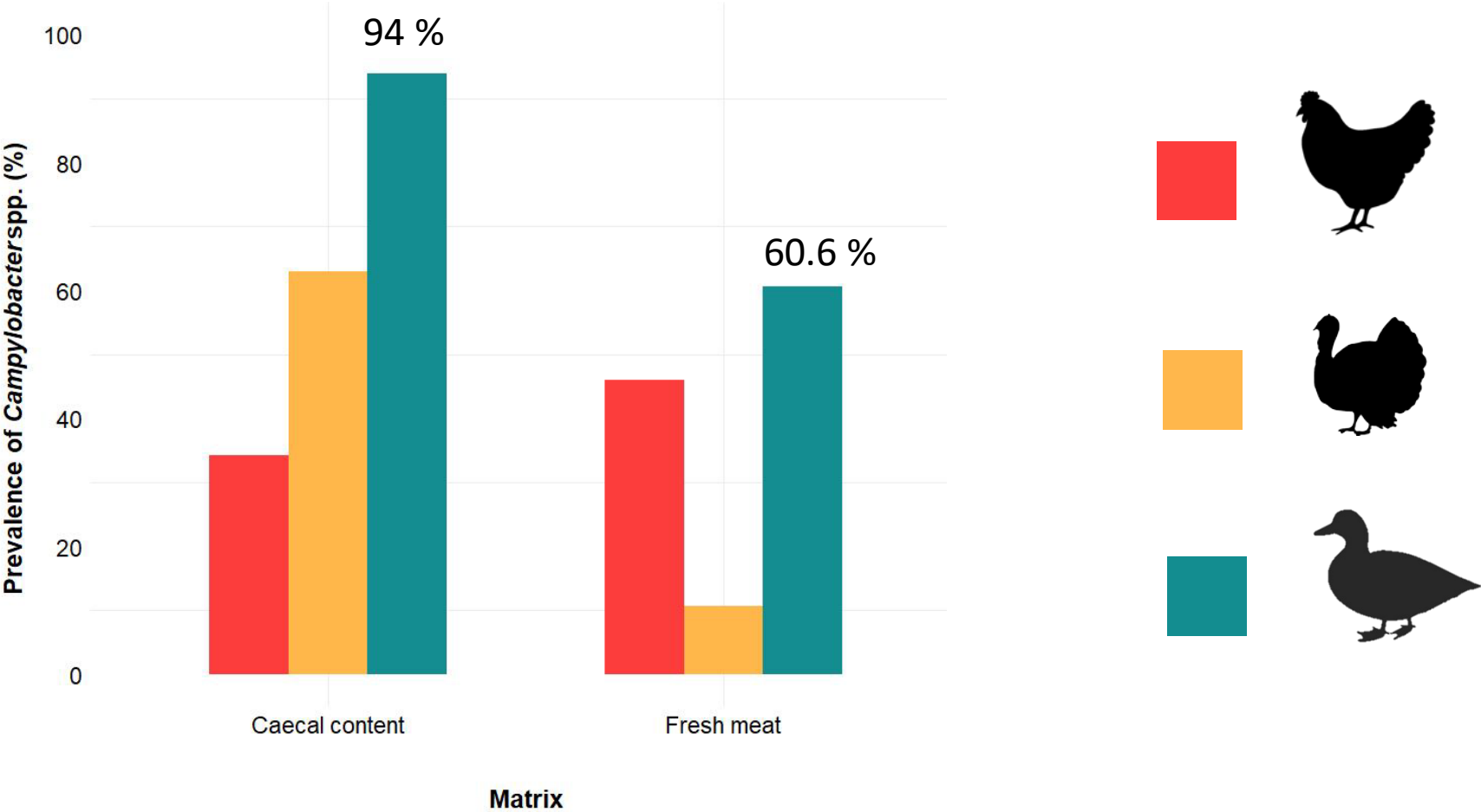
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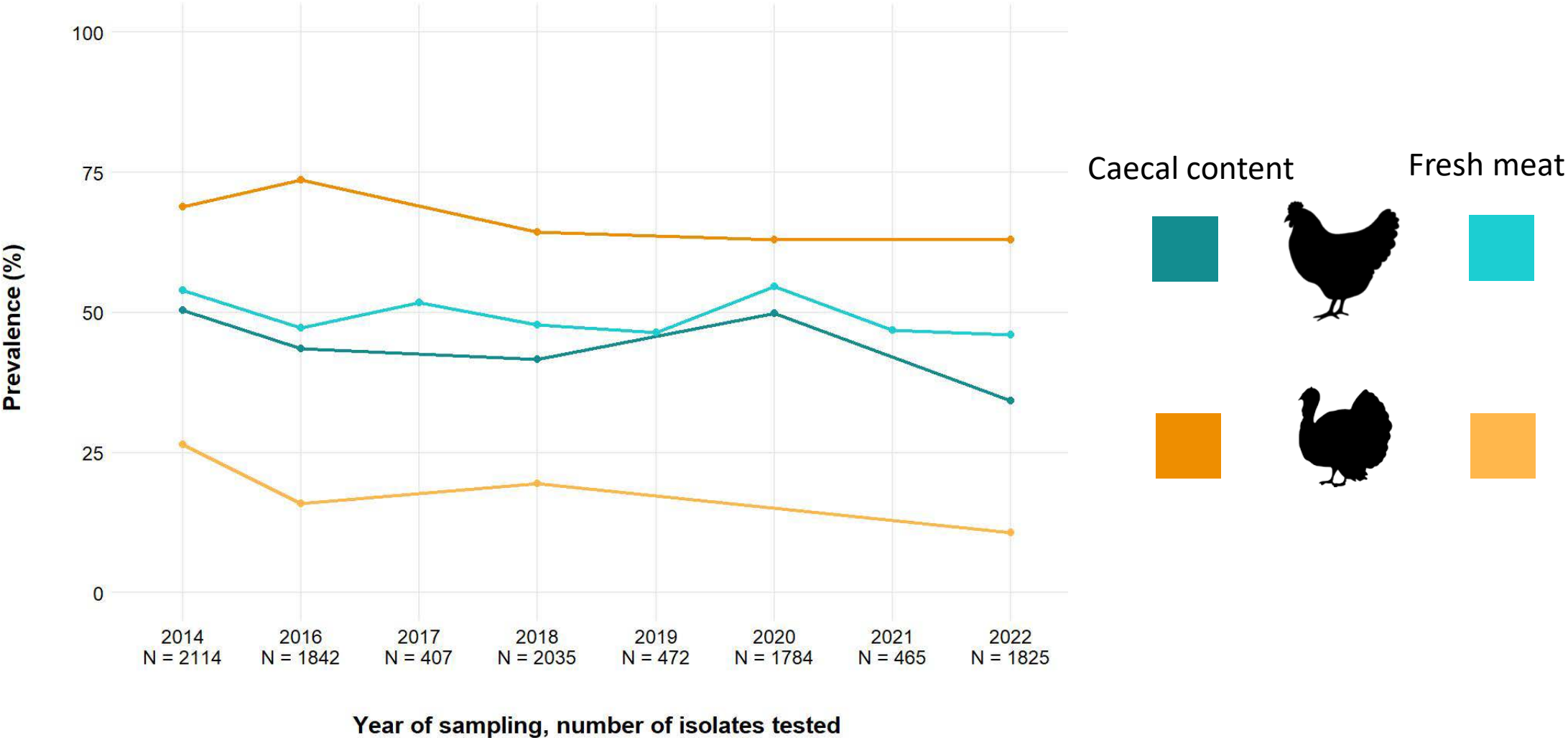
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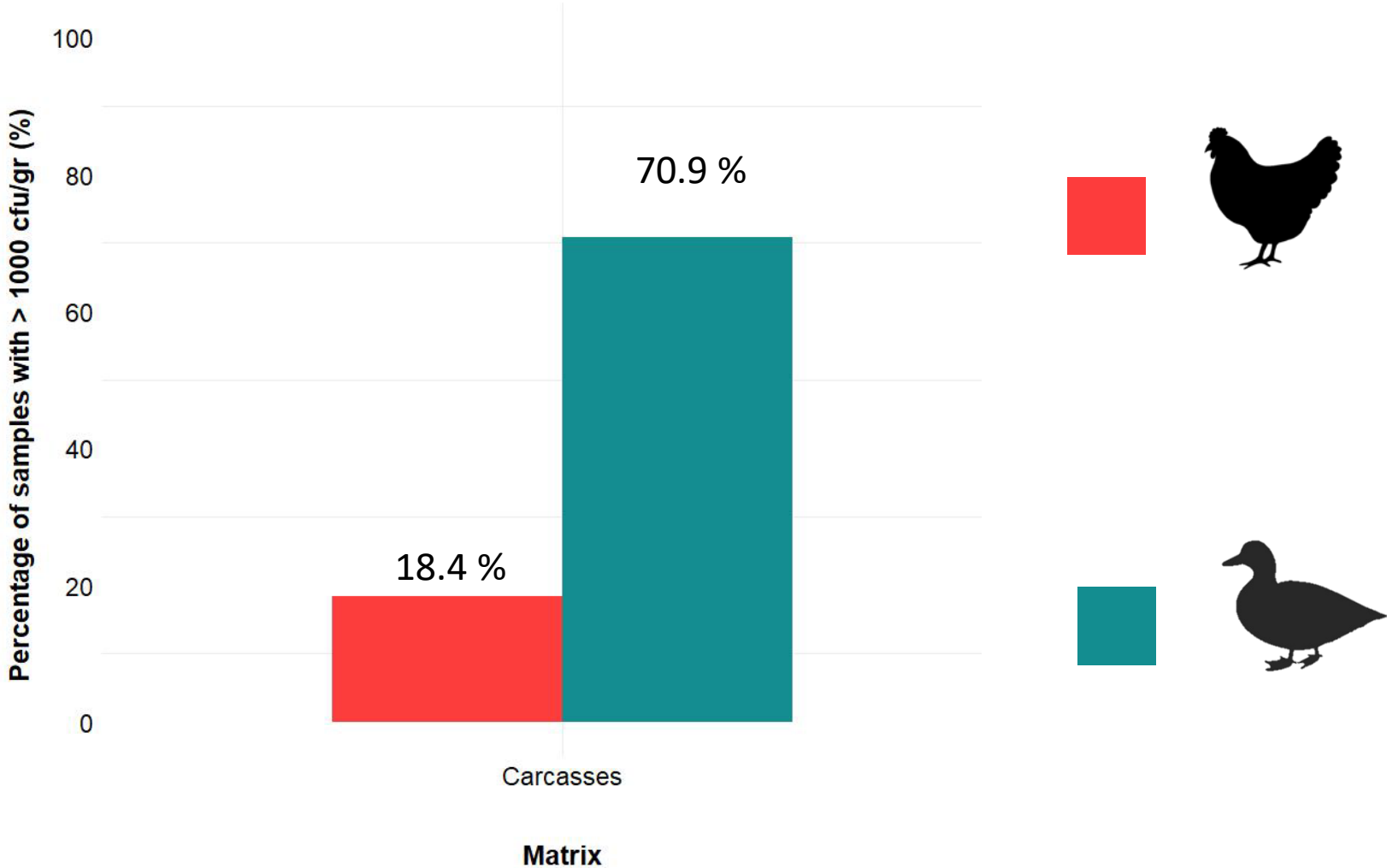
# Zoonoses Monitoring 2022: Qualitative *Campylobacter* spp.



# Zoonoses Monitoring 2014 - 2022: Qualitative *Campylobacter* spp.



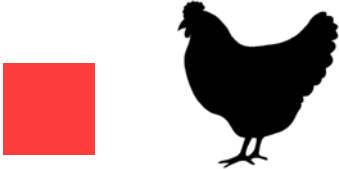
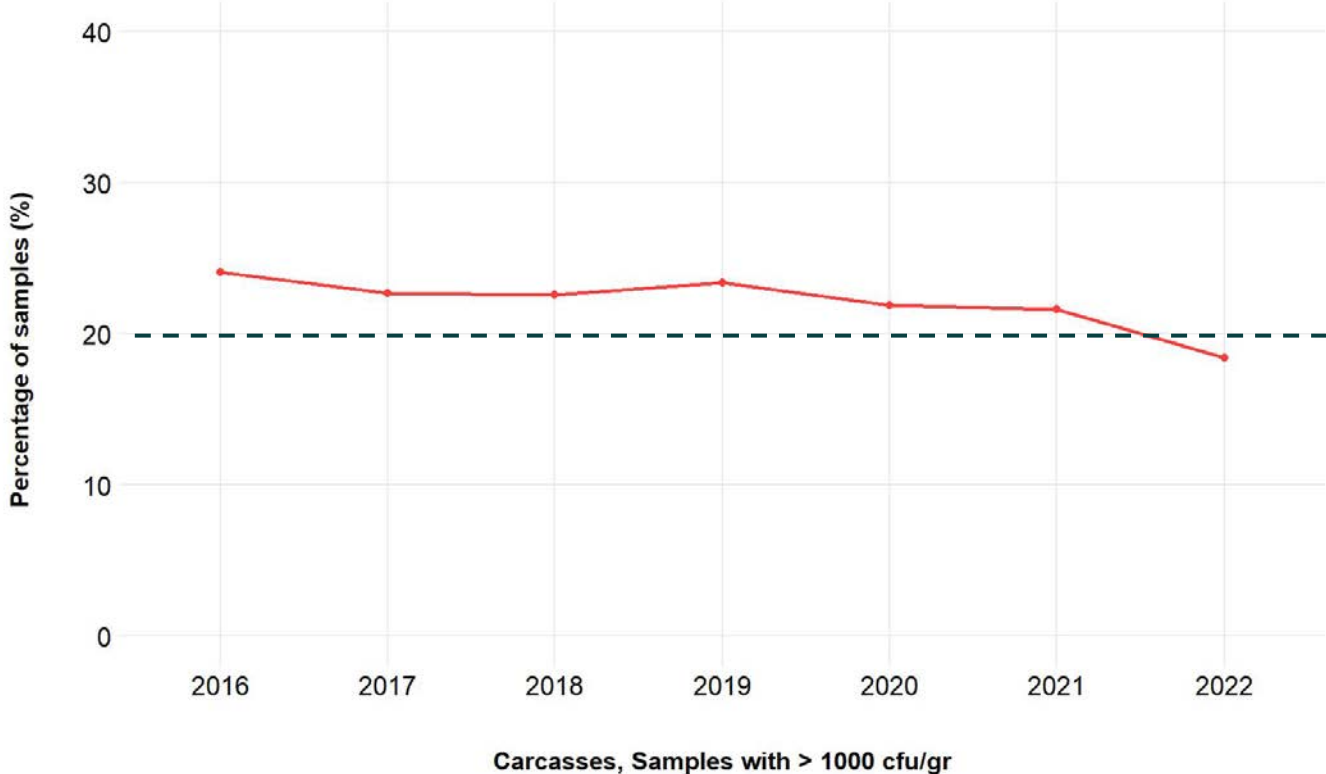
# Zoonoses Monitoring 2022: Quantitative *Campylobacter* spp. > 1000 CFU/g



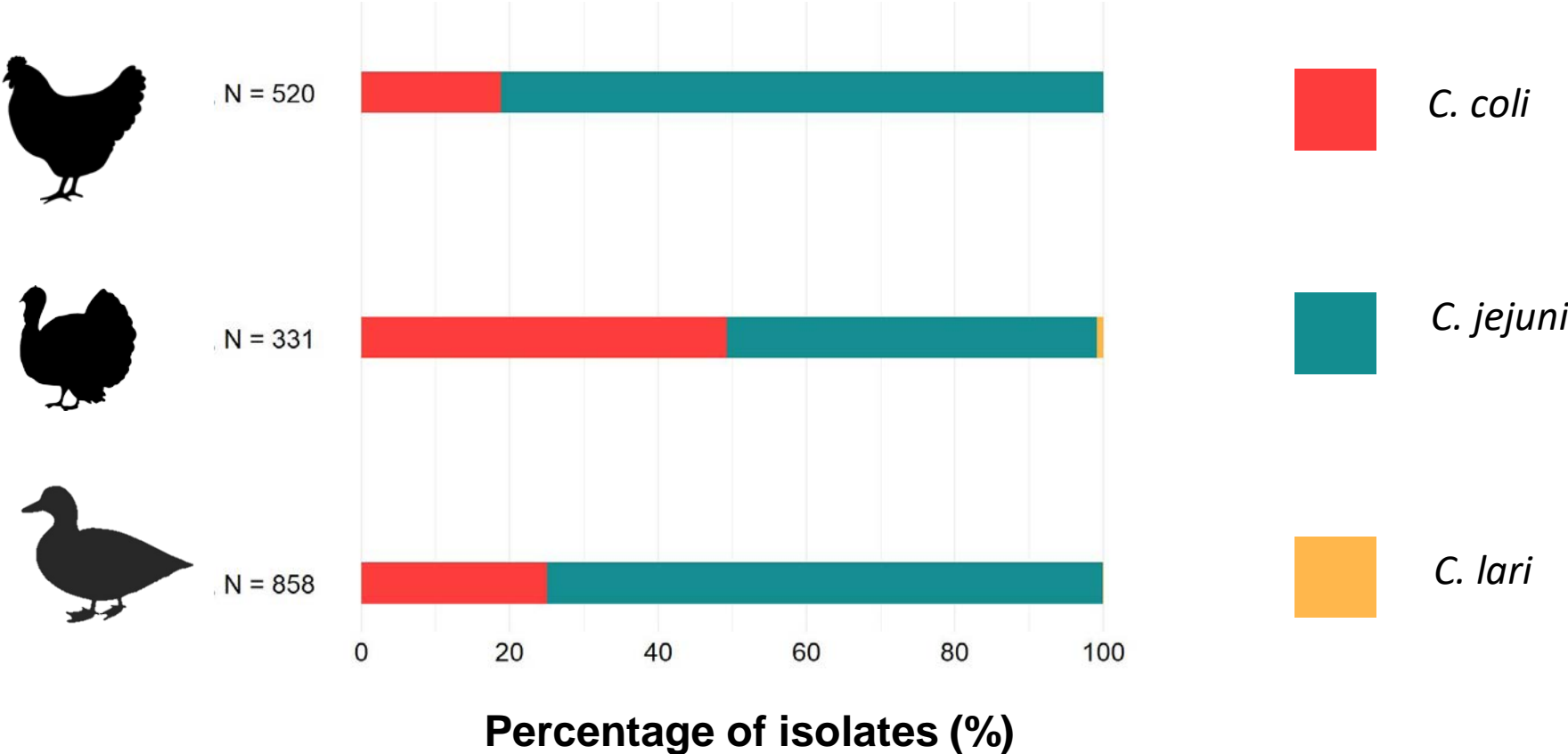
# Zoonoses Monitoring 2016 - 2022: Quantitative *Campylobacter* spp. > 1000 cfu/gr

Process hygiene criterion at the slaughterhouse (EC) No 2073/2005

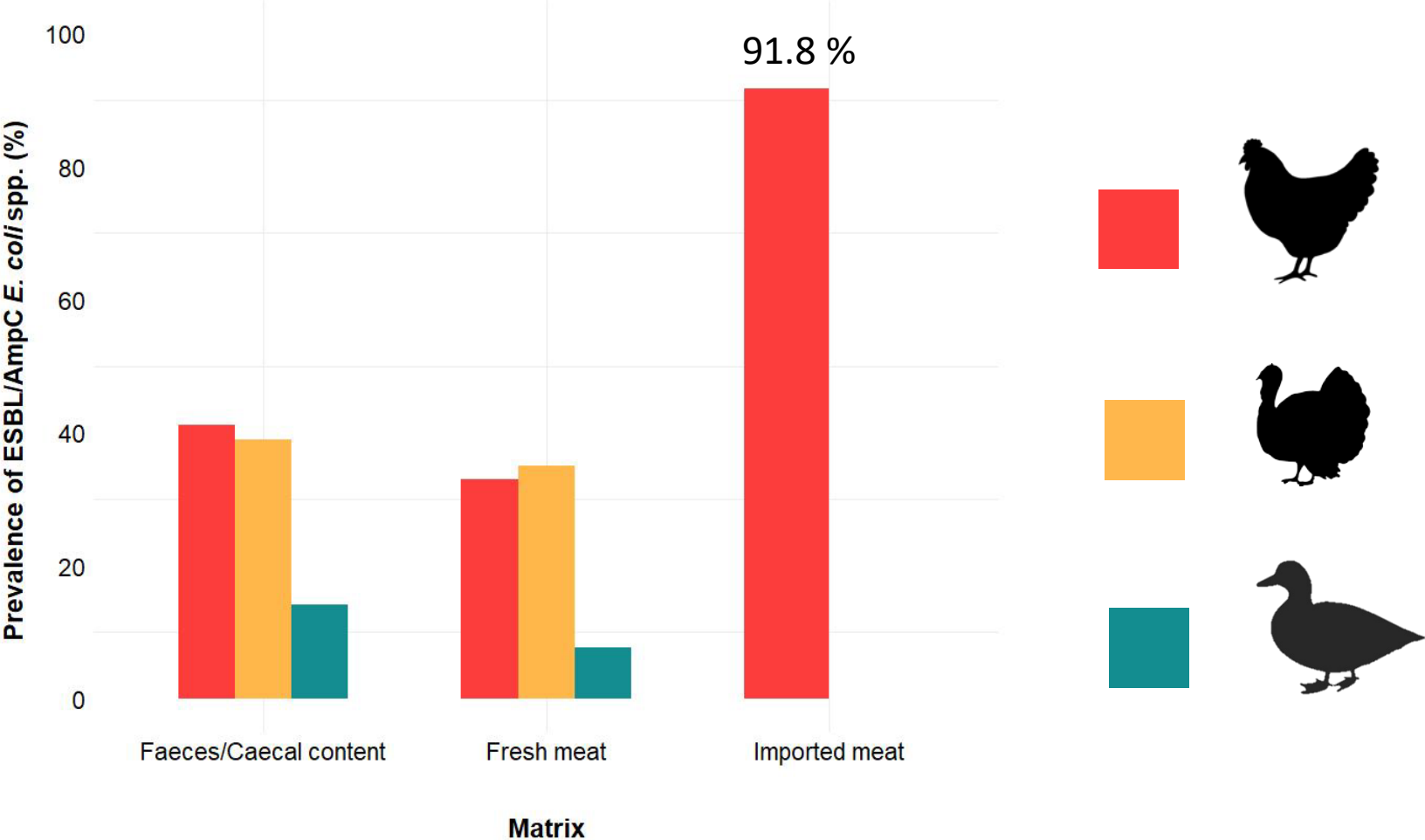
- From 2018 < 40%
- From 2020 < 30%
- From 2025 < 20%



# Zoonoses Monitoring 2022: *Campylobacter* spp.

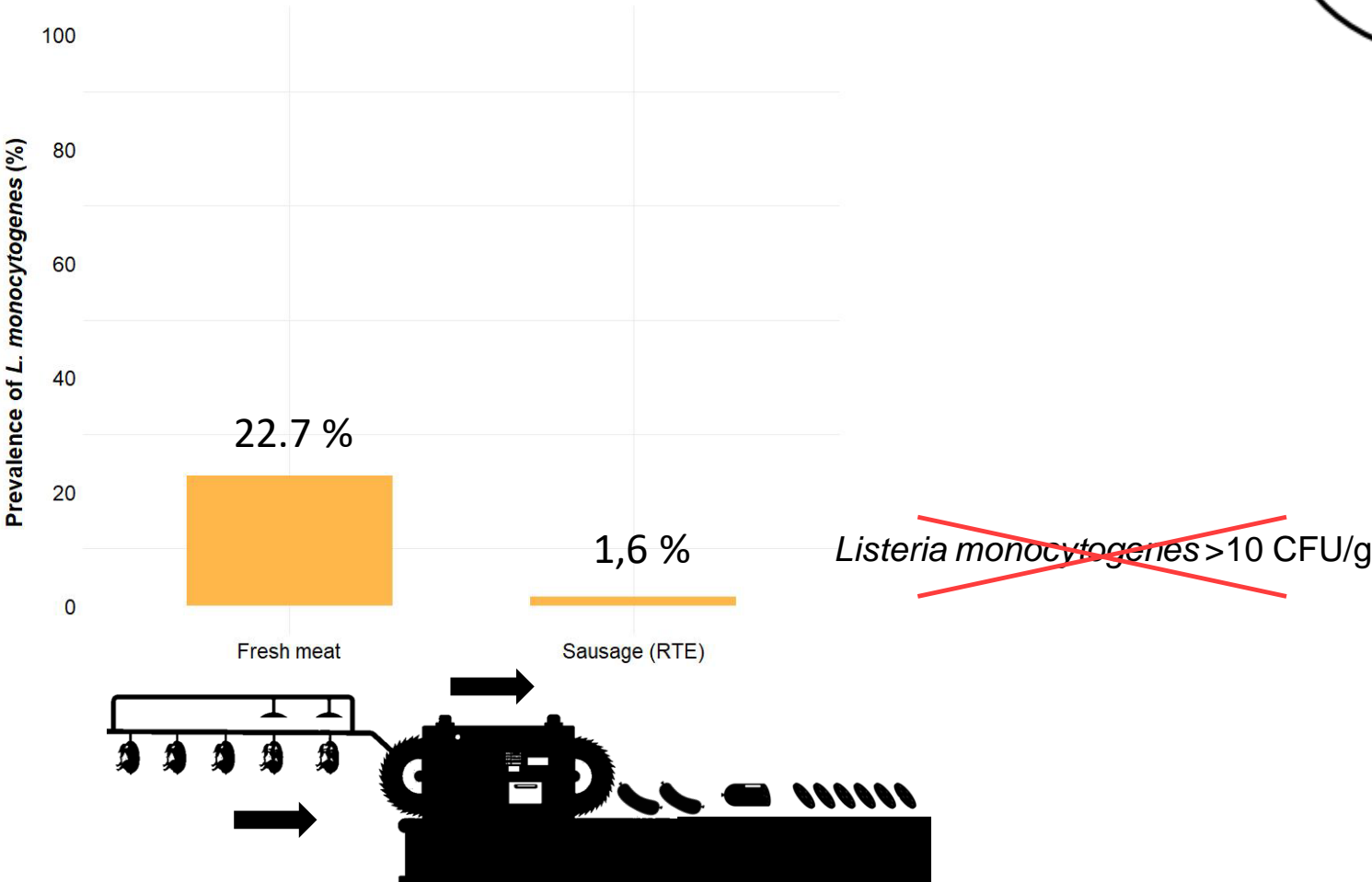
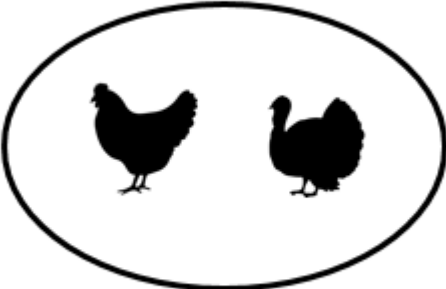


# Zoonoses Monitoring 2022: ESBL/AmpC *E. coli*



# Zoonoses Monitoring 2022: *Listeria monocytogenes*

Processing plant: poultry meat vs sliced boiled sausages





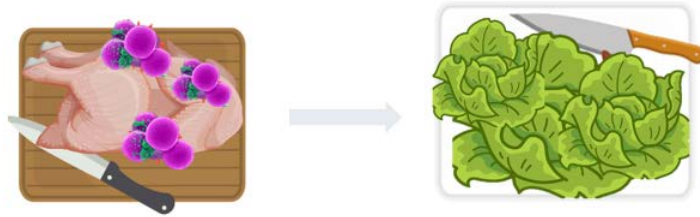
# Conclusions

- ✓ **Zoonoses monitoring** makes an important contribution to consumer health protection
  - ✓ **Fattening ducks** > *Salmonella* spp. and *Campylobacter* spp. than **broilers** and **turkeys**.
  - ✓ **Individual slaughterhouses** - high detection rates -> significant **hygiene deficiencies**
  - ✓ **Fattening ducks** < ESBL/AmpC -*E. coli* than **broilers** and **turkeys**.
  - ✓ **> 90 % Imported chicken meat** -> **ESBL/AmpC - *E. coli***
  - ✓ **Listeria in RTE** poultry products
- ✓ **Zoonotic bacteria** can **reach the consumer** via consumption of poultry meat
  - ✓ Efforts to reduce zoonotic bacteria in the poultry meat chain
  - ✓ Consistent consumer education about the risks associated with fresh poultry meat

# Take-home message:

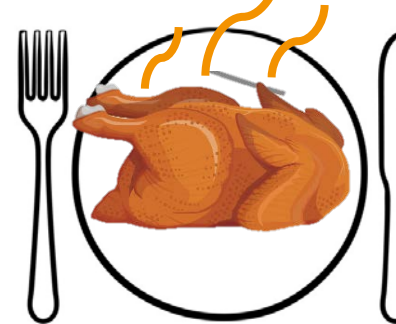
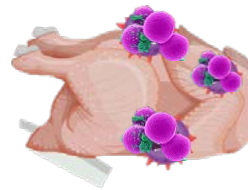
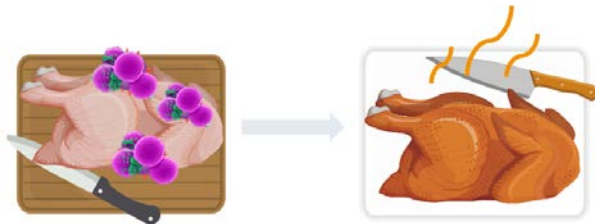


## Microbial growth:



**Cross-contamination:** transfer from a contaminated product to a non contaminated product via kitchen utensils

## Microbial inactivation:

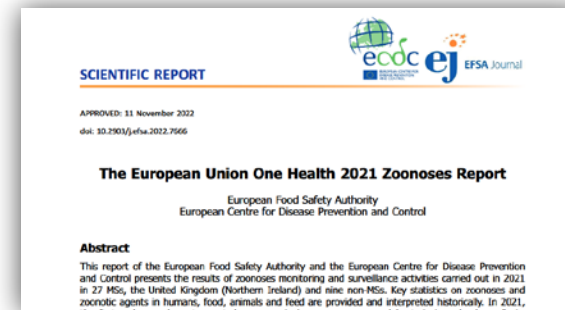
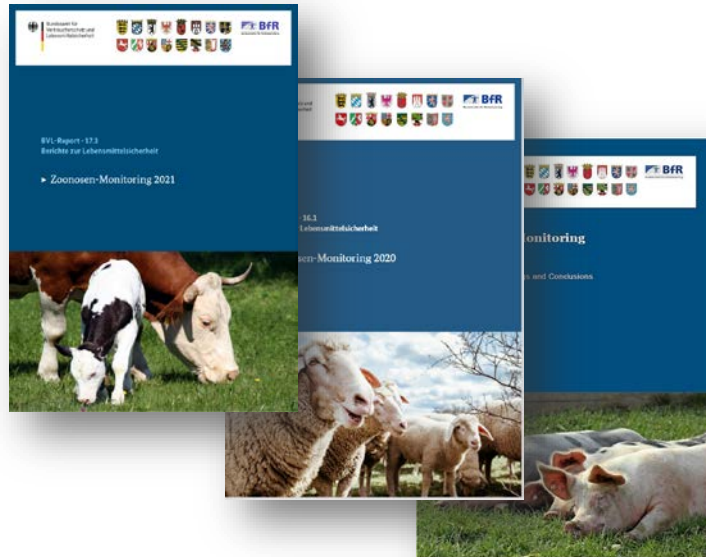


**Recontamination:** food contamination after the inactivation process

<https://images.app.goo.gl/J1EmdfudgLQw7q3X7>

[https://de.freepik.com/vektoren-kostenlos/hintergrundschablone-der-modernen-kueche-innen-cartoon-abendessen-zimmer-mit-moebeln\\_2238444.htm#query=huettenkueche&position=8&from\\_view=keyword&track=ais](https://de.freepik.com/vektoren-kostenlos/hintergrundschablone-der-modernen-kueche-innen-cartoon-abendessen-zimmer-mit-moebeln_2238444.htm#query=huettenkueche&position=8&from_view=keyword&track=ais)

# Where to find more about ZoMo-2022?



# Data sharing?



- ✓ *Salmonella* spp.
- ✓ *Campylobacter* spp.
- ✓ *Listeria monocytogenes*
- ✓ FBO
- ✓ AMR

- ✓ Shiga toxin-producing *E. coli*
- ✓ *Mycobacterium bovis/caprae*
- ✓ *Brucella*
- ✓ AMR

## Story maps

**Where Salmonella is found**

Salmonella is present in many different environments:

- In soil
- In water
- On surfaces

It is extremely hard to fight Salmonella because of its ability to survive even in extreme conditions and with very few nutrients. This allows it to persist for up to several months, also thanks to its ability to form biofilms, which are bacterial communities that protect themselves from stress factors.

A wide range of domestic and wild animals can host Salmonella, and thereby become reservoirs:

- Poultry
- Wild birds
- Swine
- Cattle
- Rodents
- Reptiles and amphibians
- Pets, such as dogs and cats

S. enterica, subsp. enterica serovars are principally associated with warm-blooded animals, whereas the other non-enterica subspecies are generally associated with cold-blooded animals, although they can also be found in warm-blooded animals. Hosts acting as salmonella amplifiers include rodents and pets, which play a crucial role in the introduction and spread of the bacteria at farm level (Foodborne Bioterrorism, 2017).

Given its presence in a wide range of animals, which can spread bacteria through faeces, it is no surprise that Salmonella can be found in food both of animal and non-animal origin (e.g., vegetables) as well as in animal feed. In the case of vegetables, the bacteria can be present as a result of indirect contamination, for example through the spread of contaminated sewage by domestic and wild animals, or due to cross-contamination along the productive chain (EFSA, 2015).

## Dashboards

**Salmonella**  
Summary of Salmonella statistics related to major food categories

EU and non EU: (All) | RTE and non RTE: (All) | Food category: (All)

Number of countries: 37 | Number of sampling units tested: 3,427,533

Each graph can be maximized with the icon that appears in the right corner of the titlebar.

Reporting year	Food category	RTE and non RTE	N countries	N sampling units tested
2021	Fruits, vegetables and juices	non RTE	17	3,204
		RTE	22	6,281
		<b>Total</b>	<b>23</b>	<b>12,485</b>
Egg and egg products	non RTE	24	14,639	
	RTE	6	178	
		<b>Total</b>	<b>25</b>	<b>14,817</b>
Fish and fishery products	non RTE	25	10,338	
	RTE	27	4,921	
		<b>Total</b>	<b>30</b>	<b>15,259</b>
Milk and dairy products	non RTE	15	2,616	
	RTE	30	43,144	
		<b>Total</b>	<b>30</b>	<b>45,760</b>
Meat and meat products	non RTE	35	856,144	
	RTE	27	41,471	

<https://www.efsa.europa.eu/en/microstrategy/salmonella-dashboard>

# Data sharing?



**What about Germany?**

# THANKYOU!

- Personnel who contributed to the samples collection
- Regional laboratories of the German Federal States
- The Federal Office of Consumer Protection and Food Safety (BVL)
- National Reference Laboratories at BfR (NRLs)
- Group 43 (BfR): Epidemiology, Zoonoses and Antimicrobial Resistance



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