

Investigate, evaluate, protect

NRL *Salmonella* In France

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- **French National Reference Laboratory (NRL)**
*for *Salmonella**

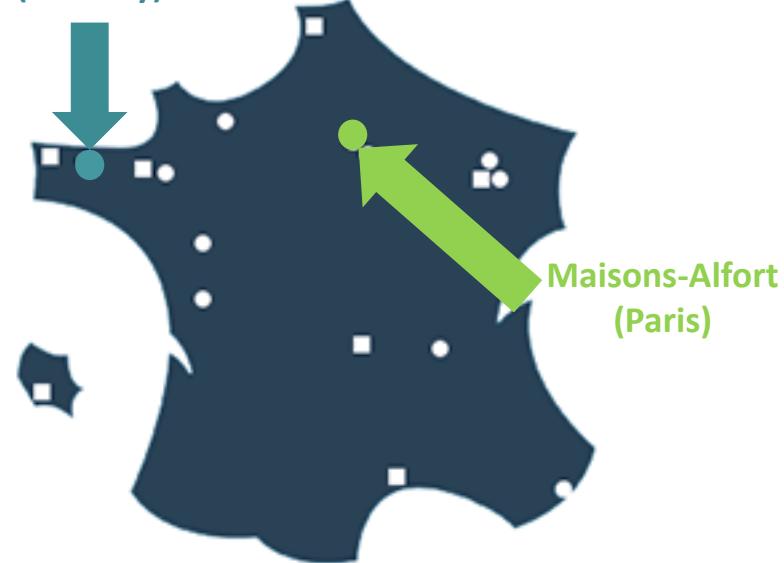
- Nominated by the French Ministry of Agriculture (DGAI)



- **French Agency for Food, Environmental and Occupational Health & Safety**

- Network of nine reference and research laboratories
 - Located throughout France
 - Close proximity to the various sectors associated with their work
- These laboratories operate in three major areas
 - Animal health and well-being
 - Food safety (chemical and biological)
 - Plant health

Ploufragan
(Brittany)



Ploufragan



Maisons-Alfort



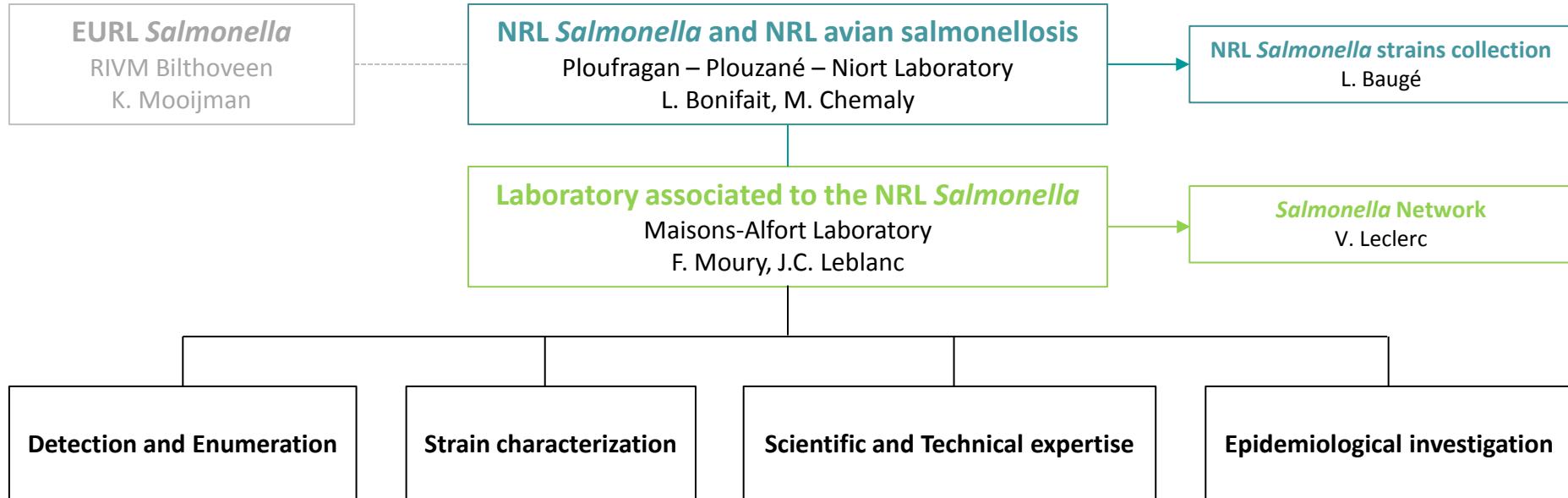
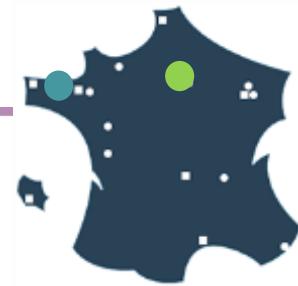
Missions of the French NRL for *Salmonella*

- **NRL for *Salmonella***

- National representative of the EURL
- Daily support and advice to the official lab network
- Contributes to the salmonellosis surveillance program
- Performs confirmatory testing and serotyping of *Salmonella* strains
- Maintain the collection of *Salmonella* isolates and the database of the related data
- Organizes national meetings with the official laboratories
- Coordinates and performs national inter-laboratory comparison assays
- Maintain strong collaboration with the national reference center (NRC) for *Salmonella* and the French Institute for Public Health Surveillance (SPF)



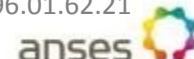
French NRL : Organisation chart



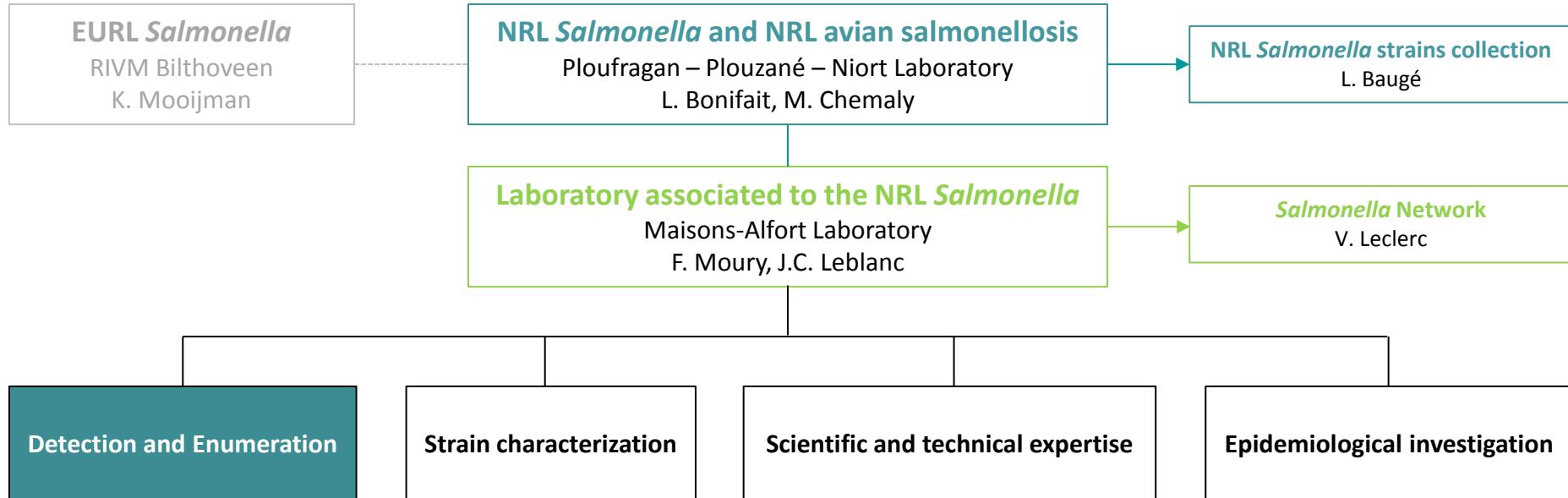
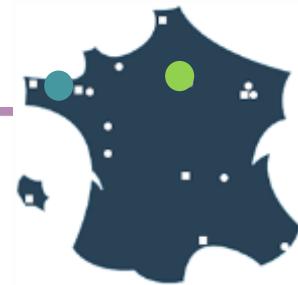
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French NRL : Organisation chart



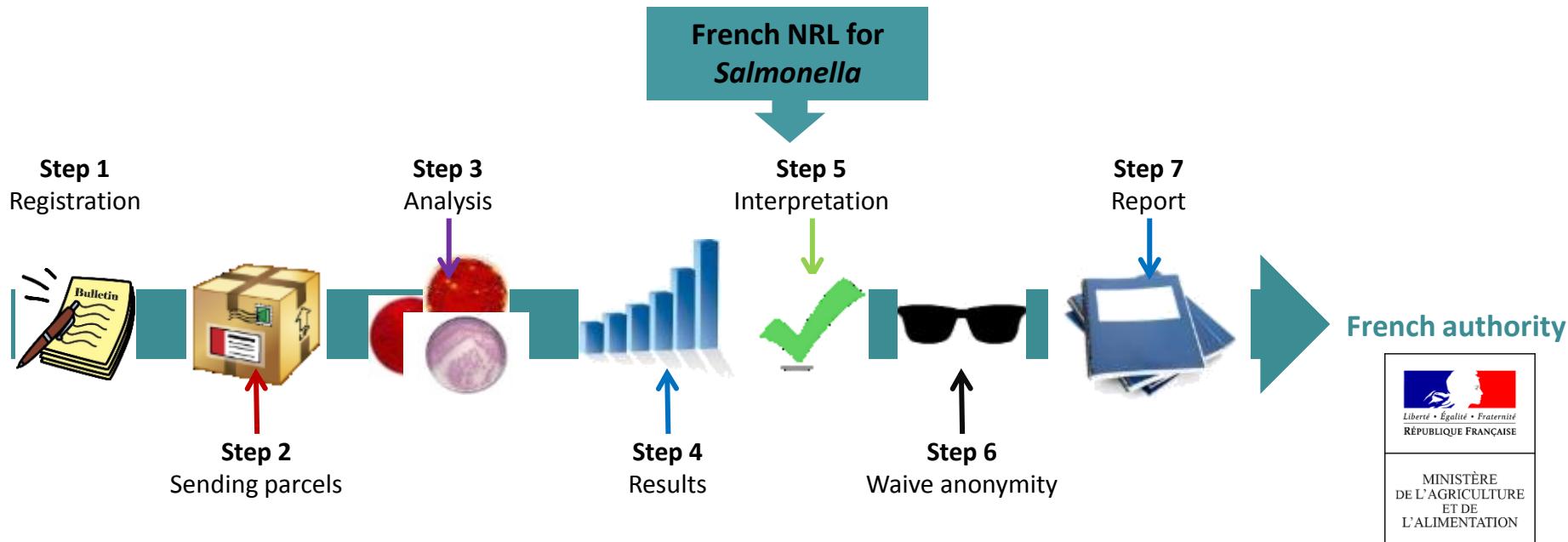
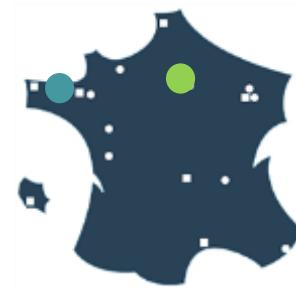
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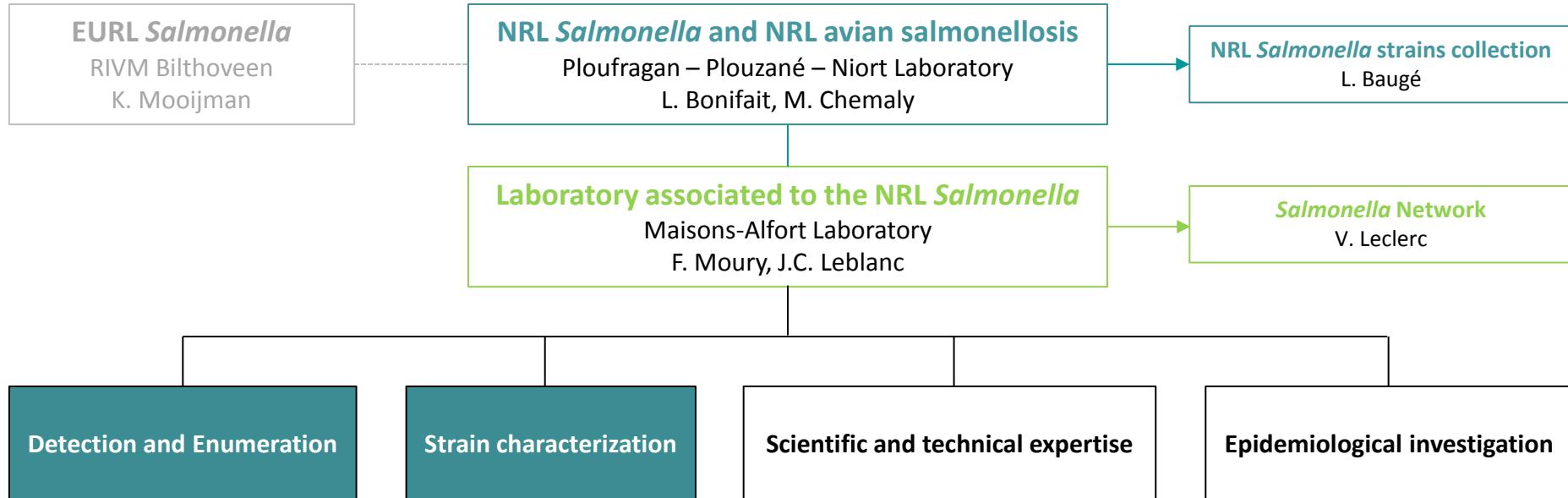
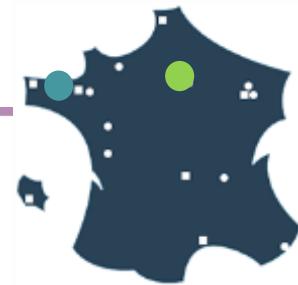
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Detection and Enumeration : Organization of PTs

- **Regulation (EU) 2017/625** : Verify the technical performance of official laboratories
- **French NRL *Salmonella***
 - Detection of *Salmonella* spp. in samples at the stage of Primary Productions
 - Detection of *Salmonella* spp. in food
 - Serotyping of *Salmonella*



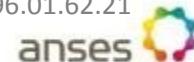
French NRL : Organisation chart



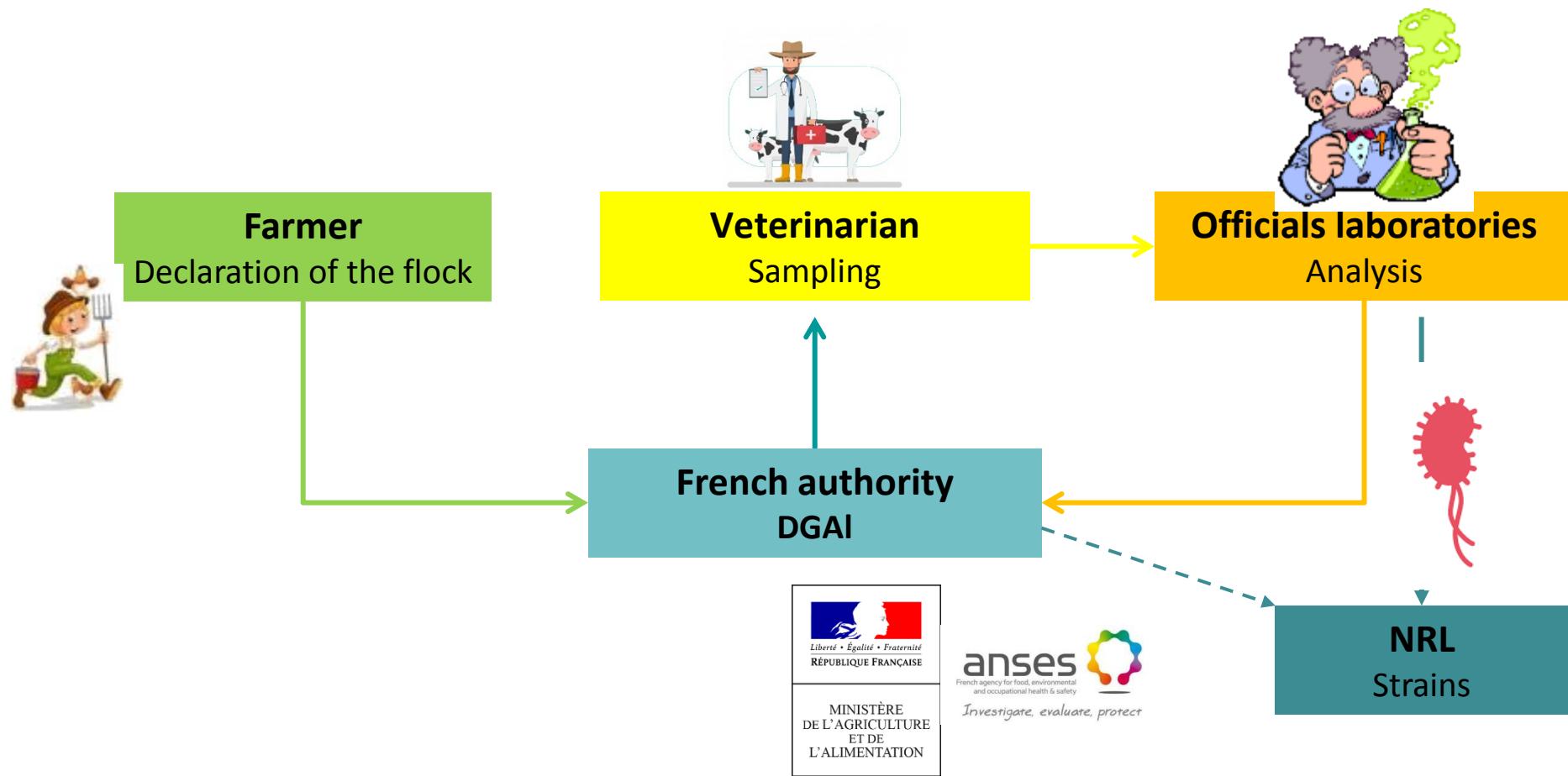
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Flow chart of *Salmonella* control in poultry flocks in France

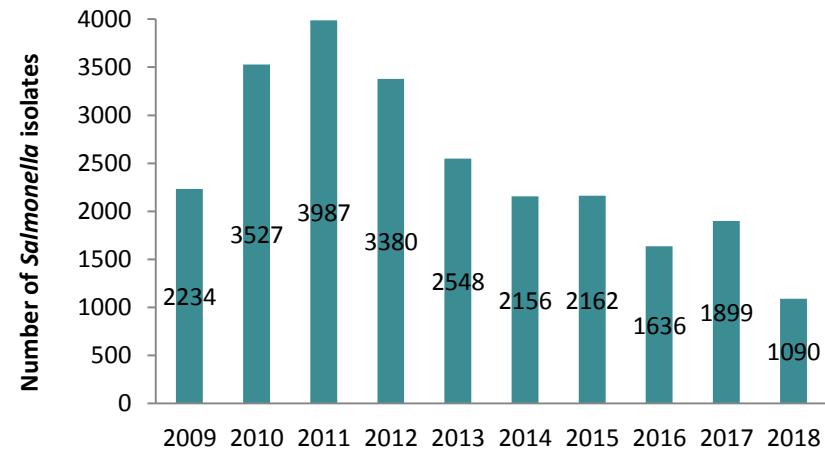


- Monitoring of *Salmonella* in poultry flocks is laid down by the regulation (EC) 2160/2003

NRL *Salmonella* strains collection

- All *Salmonella* strains

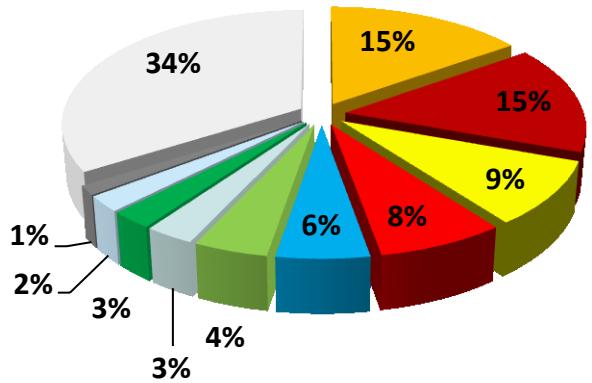
- Isolated from poultry farms positives controls
 - Different origins
 - Different steps
 - Different source samples
 - Isolated and identified (NF EN ISO 6579-1 / NF U 47-100)
 - Sent to the NRL
 - Appointed to keep all strains for at least 2 years
 - Allows the selection and the follow up of *Salmonella* antibiotic resistance
- Each strain is sent with a cover note for traceability



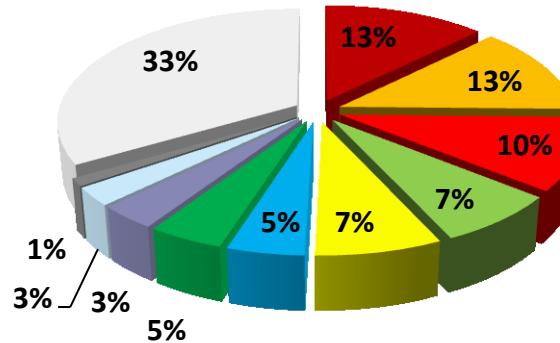
- Assessment of the strains number received per year at the French NRL *Salmonella*
- Trend of *Salmonella* infections in the poultry flocks in France

Trend of *Salmonella* contamination in poultry flocks

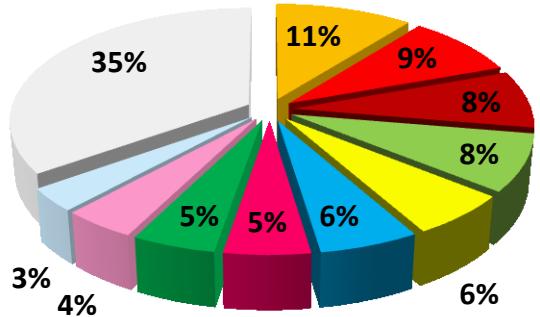
2015



2016



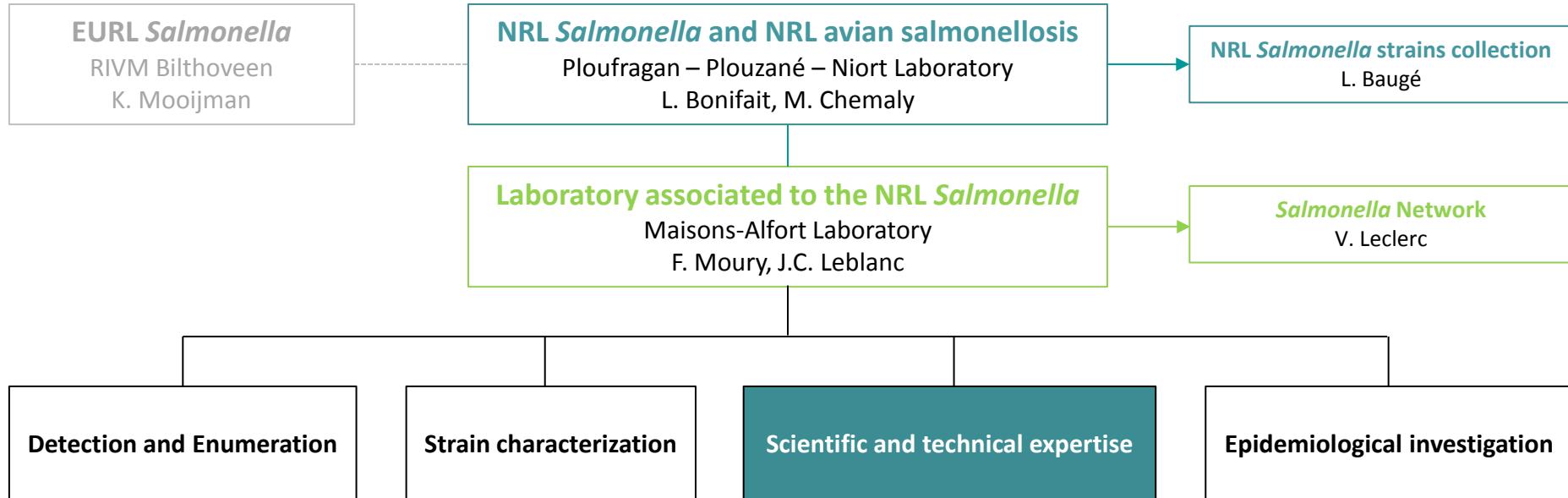
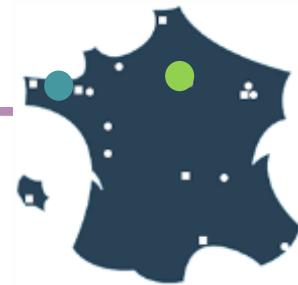
2017



- S. Enteritidis
- S. Senftenberg
- S. Indiana
- S. Typhimurium
- S. Napoli
- S. Montevideo
- S. Agona
- S. Mbandaka
- S. Livingstone
- S. Anatum
- Others

- S. Enteritidis
- S. Typhimurium
- S. Senftenberg
- S. Montevideo
- S. Indiana
- S. Napoli
- S. Coeln
- S. Mbandaka
- S. Saintpaul
- S. Livingstone
- Others

French NRL : Organisation chart

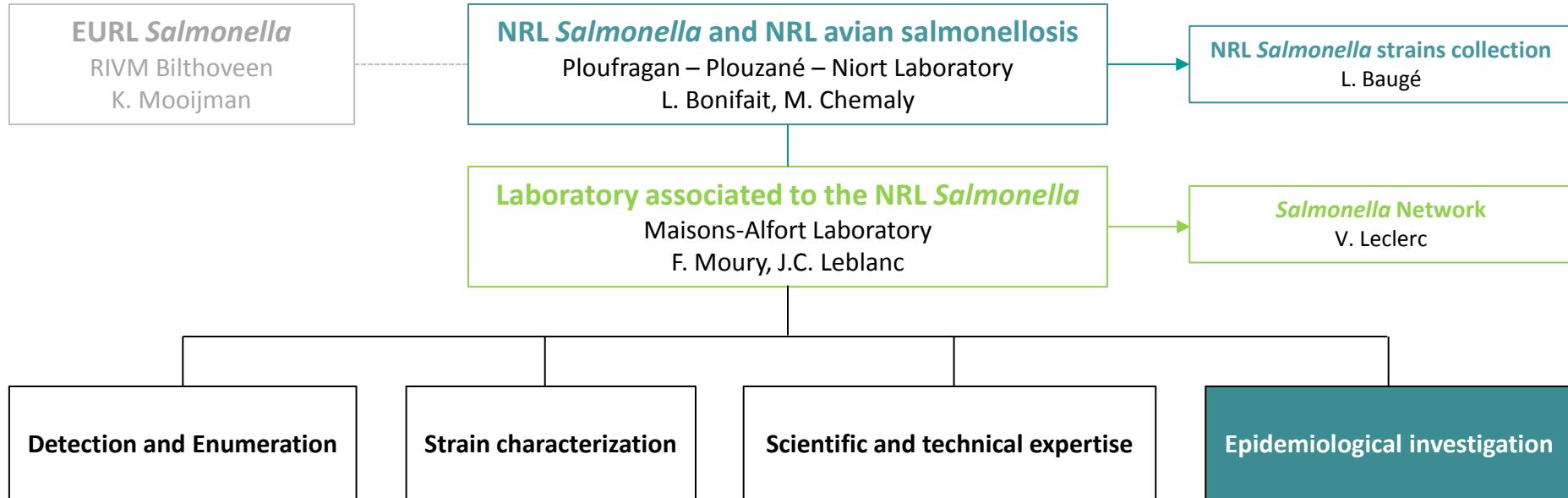
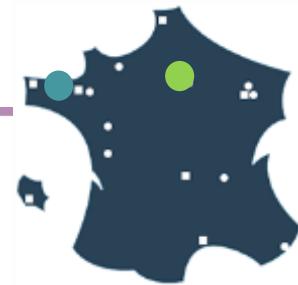


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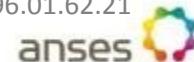
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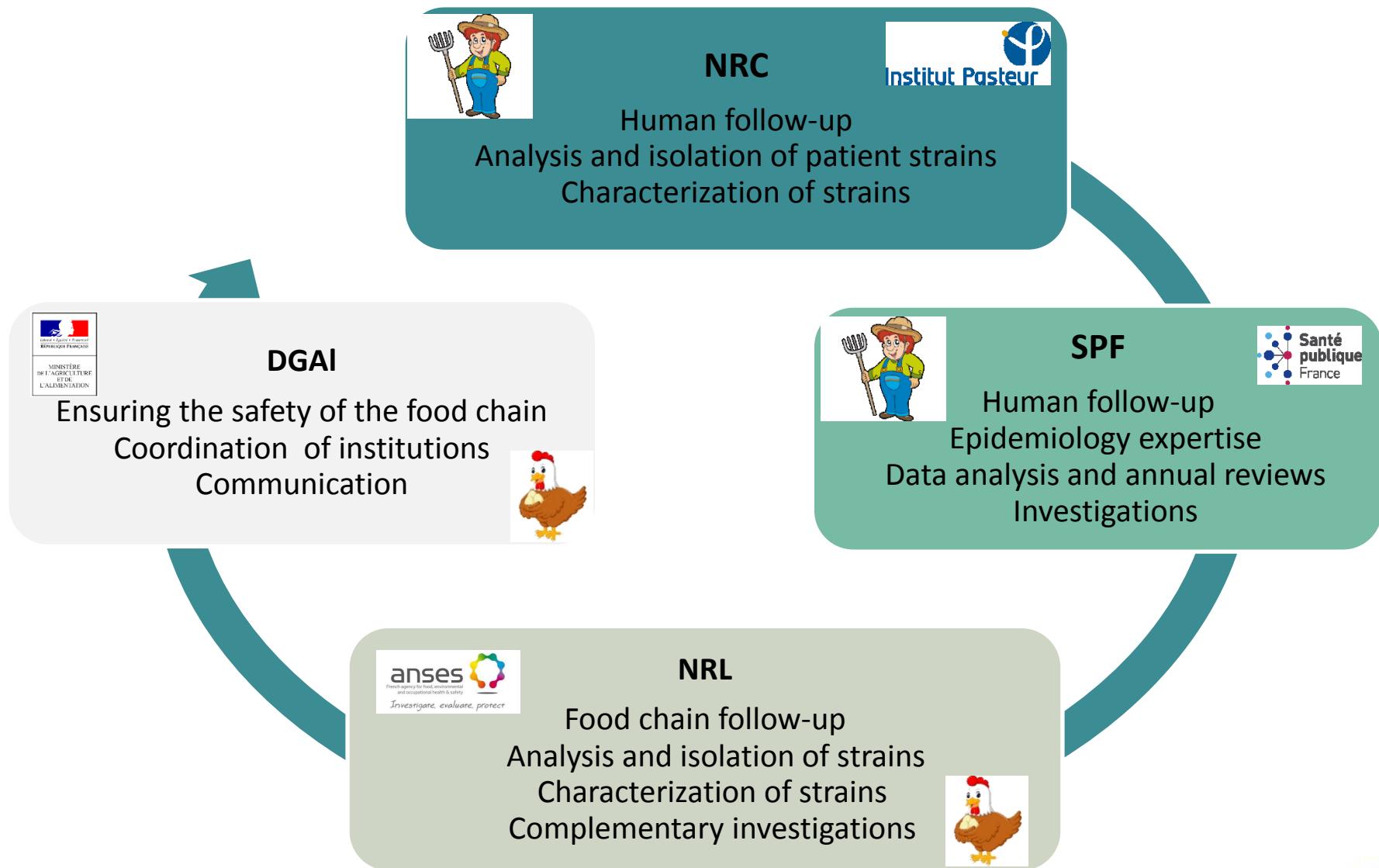


Epidemiological investigations

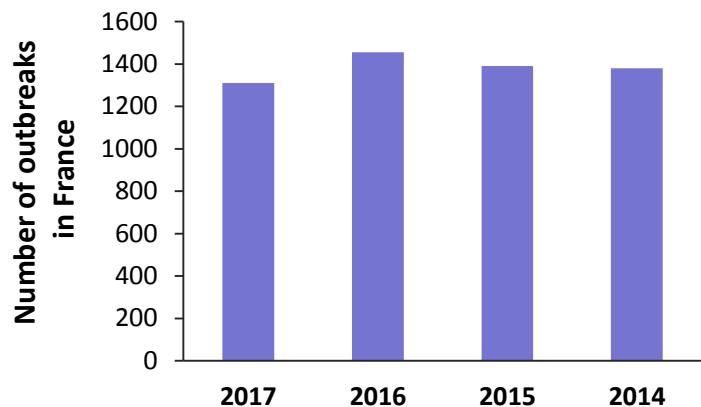
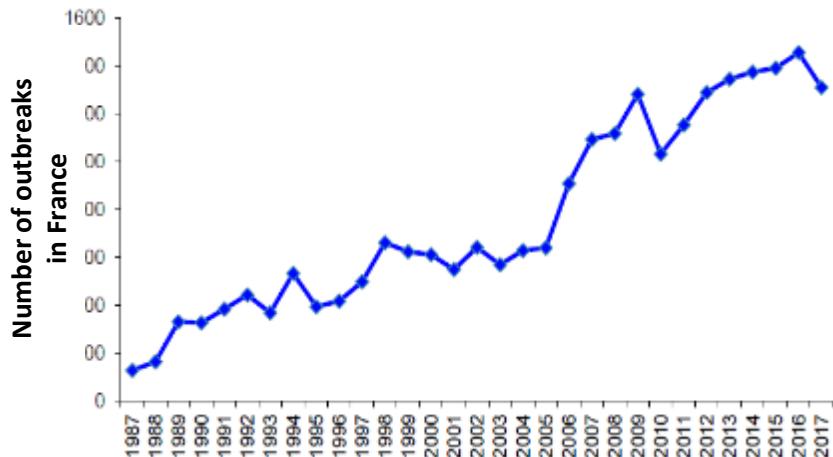
- The French authorities mandate regularly the NRL for *Salmonella* to establish epidemiological investigations
 - Characterize strains of *Salmonella* (*S. Enteritidis*)
 - Establish relationships between isolates
 - Determine the origin of contamination
- *Salmonella* NRL collection strains : Selection and typing of strains involved



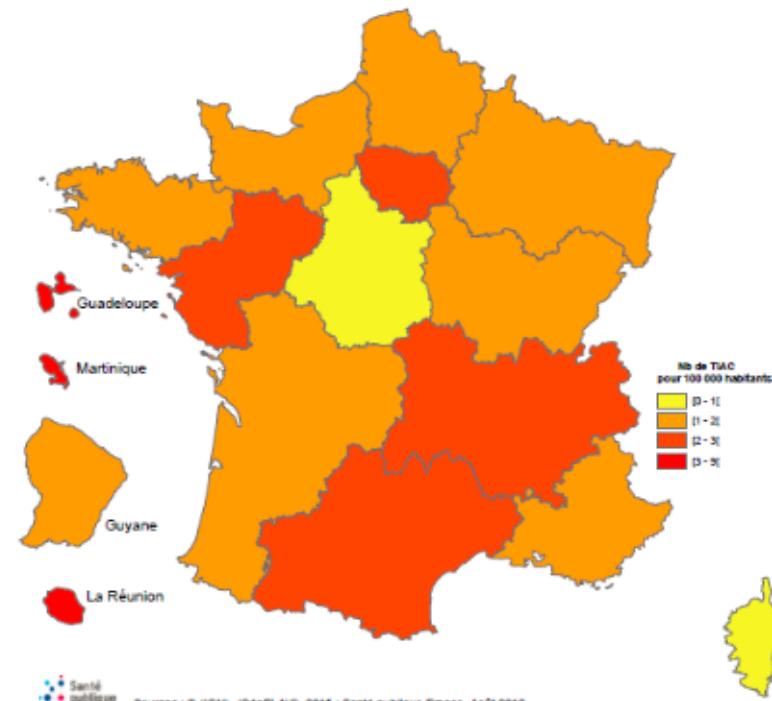
Surveillance system in France



Foodborne outbreaks in France

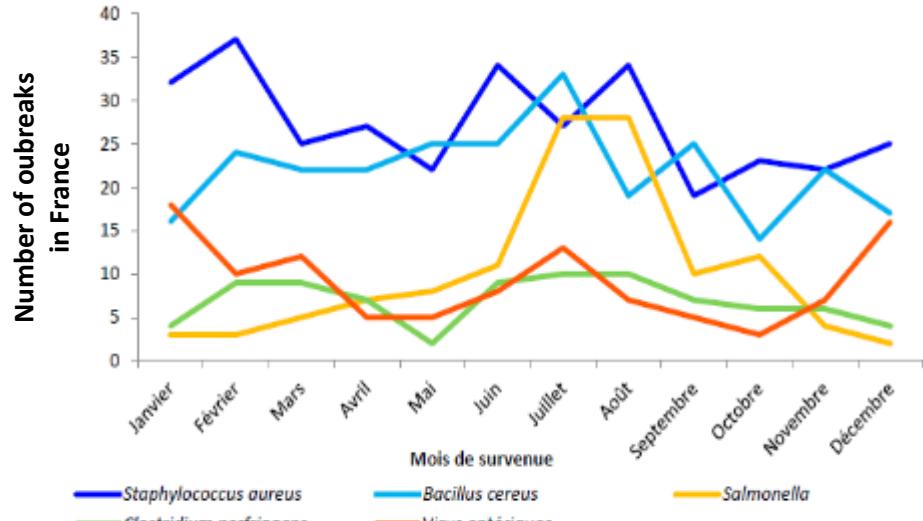
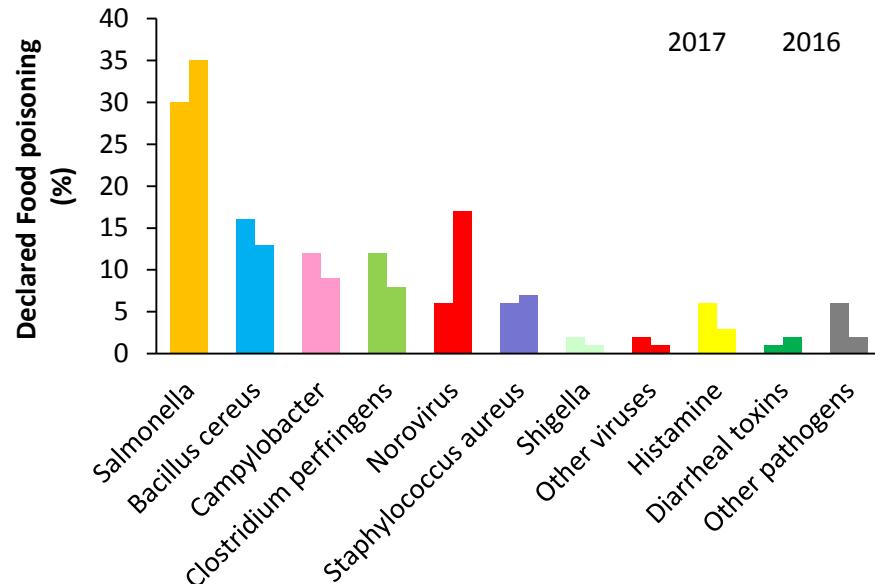


- Decrease of the number of outbreaks, in 2017, in France

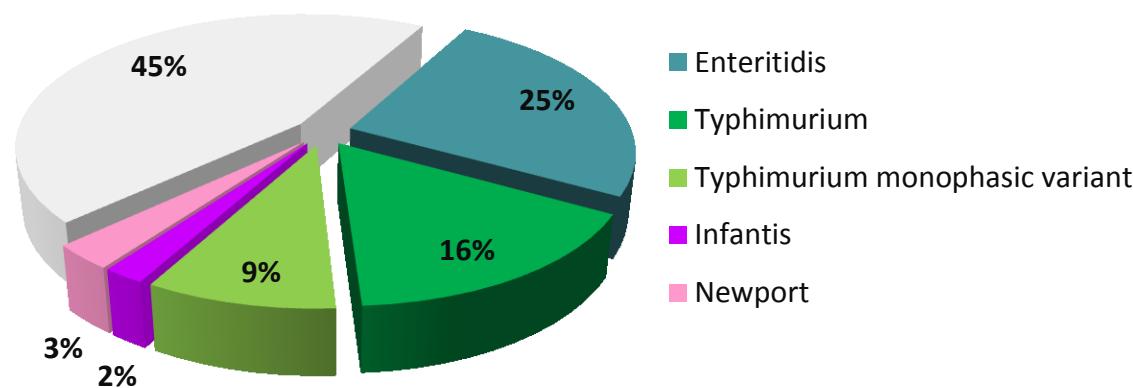


- In 2017, the number of outbreaks reported per 100,000 inhabitants in France was less than or equal to 3

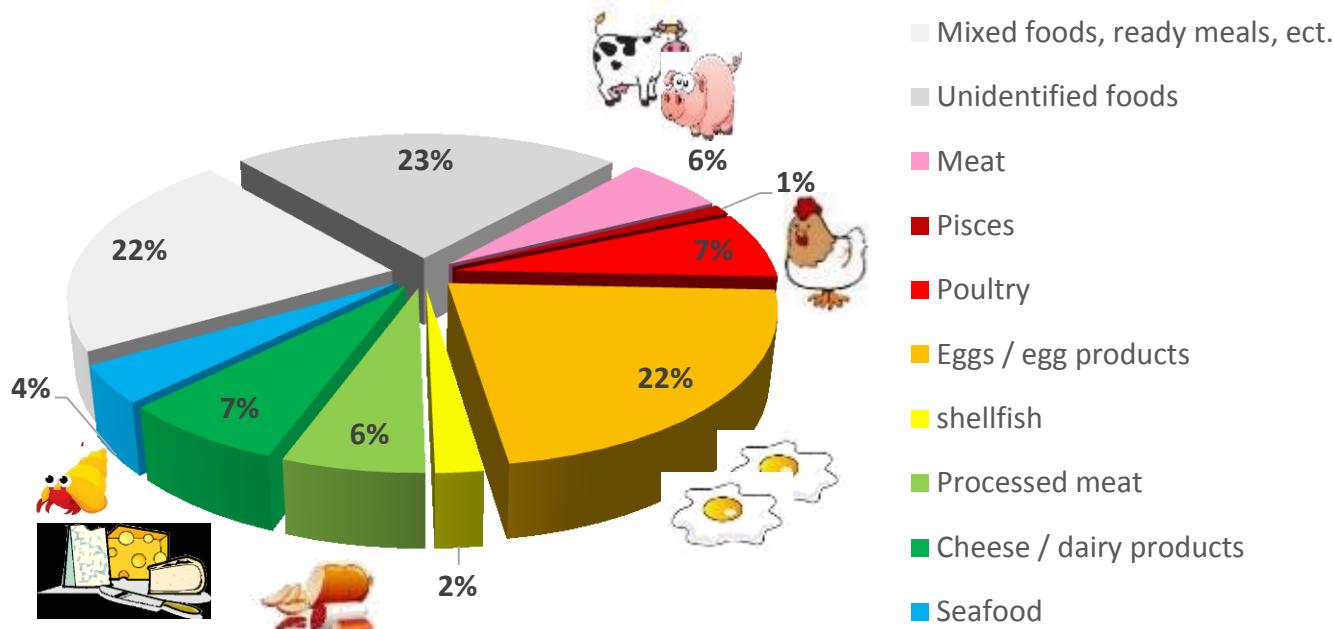
Monitoring of foodborne outbreaks in France



- *Salmonella* is the most frequently confirmed pathogen in outbreaks
 - *S. Enteritidis*
 - *S. Typhimurium*



Monitoring of foodborne outbreaks in France



- Only 33% of the outbreaks have a confirmed or suspected origin
- For *Salmonella* outbreaks
 - Consumption of eggs or egg products are the main source of infection

Epidemiological investigations

- Trace back and map *Salmonella* contaminations in poultry flocks
 - NRL relies on either PFGE or MLVA techniques to address the requested objectives
 - WGS
- The NRL showed thanks to genotyping techniques the persistence of specific strains of *Salmonella*
 - The circulation through poultry rearing steps
 - The circulation through productions (breeding, production flocks of laying hens, broilers)
 - The ability of *Salmonella* contamination across different geographical areas and different animal productions (poultry and cattle)

NRL Conclusions

- The strain collection of the French NRL is an important tool
 - Follow-up of the regulated serovars
 - Detection of the emerging serovars
- Help to adapt the control system to real situations
- Revealed the importance of Epidemiological investigations
- Highlight the importance of strong collaboration with the others members of the surveillance system



Team Anses
Ploufragan



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Maisons-Alfort

Investigate, evaluate, protect

