NRL Salmonella POLAND, National Veterinary Research Institute Puławy, Poland

Emilia Mikos-Wojewoda - Department of Microbiology,

Presentation to EURL Salmonella workshop

Kinga Wieczorek - Department of Food Safety

Tomasz Grenda - Department of Hygiene of Animal Feedingstuffs

National Veterinary Research Institute

Established in 1945 as a scientific institution of the Ministry of Agriculture and Rural Development.

NVRI is scientific research unit under Ministry of Agriculture.
The Institute includes several scientific units (Dept. of Microbiology hosting NRL for salmonellosis).

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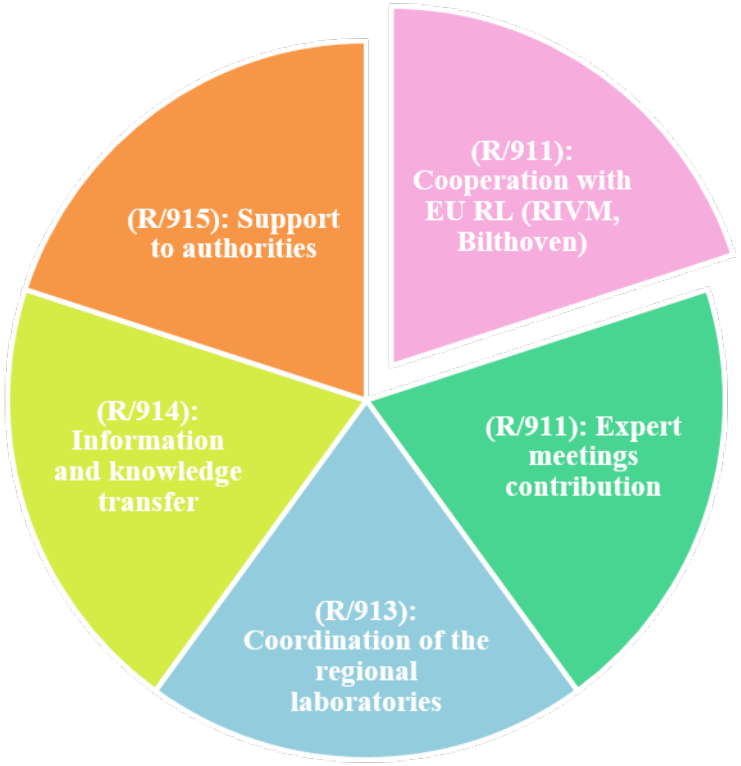
NRL Activities

1. National Reference Laboratory
   (5 tasks in line with Art. 101 Reg. 2017/625)

2. Other official monitoring programmes on *Salmonella* and AMR
3. Research on *Salmonella* detection, characterisation, epidemiology
4. Cooperation with the EURL
5. Distribution of information received from the EURL
6. Scientific & technical assistance to the Ministry of Agriculture, Veterinary Inspection
7. Supervision of Regional Veterinary Laboratories



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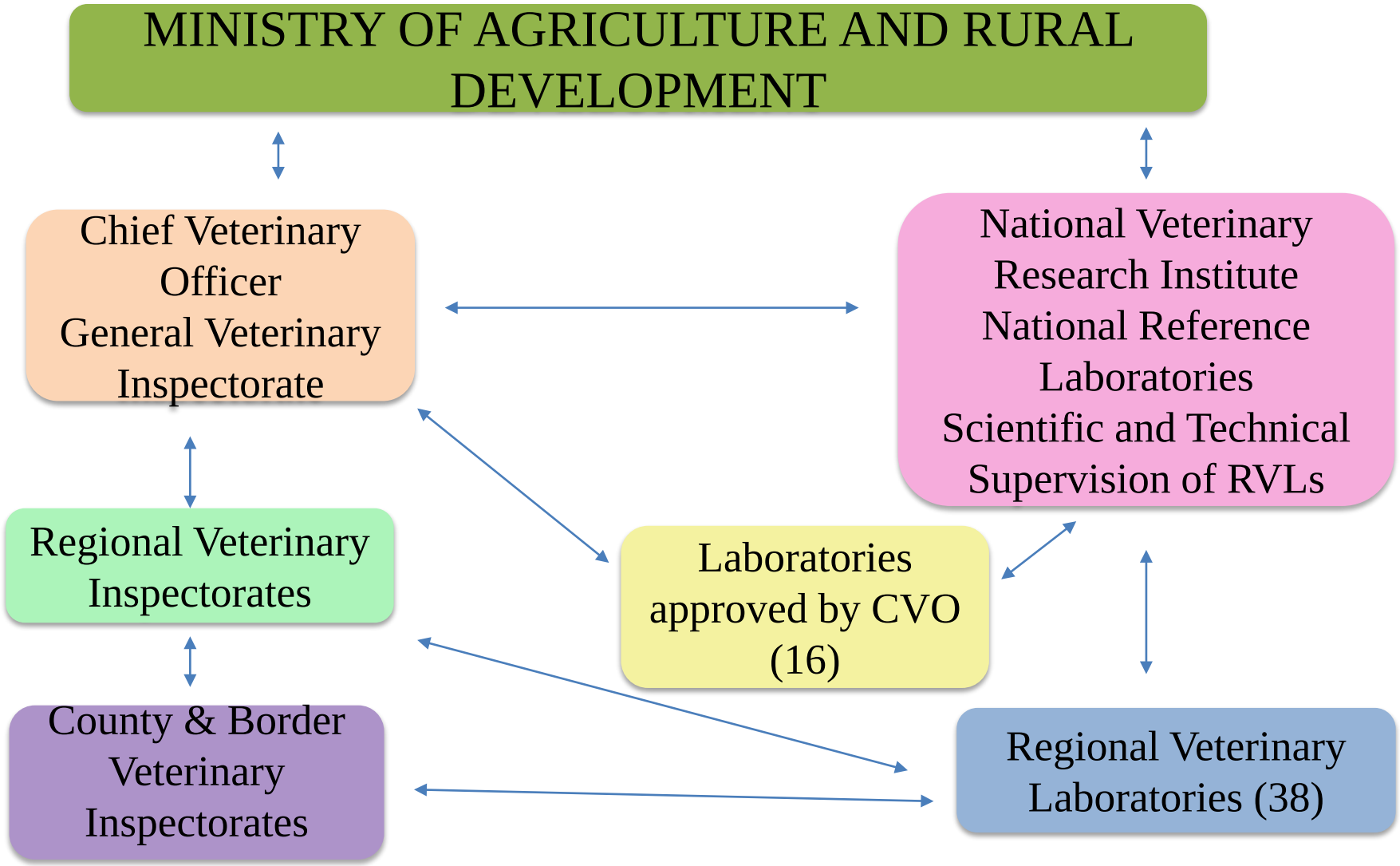
Organisation of Veterinary Laboratory diagnosis in Poland



Cooperation with EURL

- Participation in proficiency tests organised by EURL
  - detection of *Salmonella* in samples from the Primary Production Stage (PPS)
  - typing of *Salmonella*

Performance

EURL-*Salmonella* PT Serotyping 2023

EURL *Salmonella*

Evaluation:

Number of penalty points: 0 **Good Performance**

	Reference Results				**Results labcode:**			**12**
Strain	O-antigens	H-antigens (phase 1)	H-antigens (phase 2)	Serovar	O-antigens	H-antigens (phase 1)	H-antigens (phase 2)	Serovar
S1	6,8	z10	e,n,x	Hadar	6,8	z10	e,n,x	Hadar
S2	6,7,14	z10	e,n,z15	Mbandaka	6,7	z10	e,n,z15	Mbandaka
S3	6,8	z10	e,n,z15	Glostrup	6,8	z10	e,n,z15	Glostrup
S4	6,7,14	r	1,2	Virchow	6,7	r	1,2	Virchow
S5[a]	6,7	l,z13,[z28]	e,n,z15	Neukoelln	6,7	l,z13	e,n,z15	Neukoelln
S6	1,9,12	g,m	-	Enteritidis	9,12	g,m	-	Enteritidis
S7	6,7	r	1,7	Colindale	6,7	r	1,7	Colindale
S8	3,{10},{15}	l,v	1,6	London	3,10	l,v	1,6	London
S9	6,7,14	r	1,5	Infantis	6,7	r	1,5	Infantis
S10	3,10	z35	z6	Cairina	3,10	z35	z6	Cairina
S11	1,4,[5],12	f,g	[1,2]	Derby	4,12	f,g	-	Derby
S12	1,4,[5],12	e,h	e,n,x	Chester	4,12	e,h	e,n,x	Chester
S13[a]	6,8	e,h	e,n,x	Fillmore	6,8	e,h	e,n,x	Fillmore
S14	13,23	d	l,w	Putten	13,23	d	l,w	Putten
S15	1,3,19	g,[s],t	-	Senftenberg	1,3,19	g,s,t	-	Senftenberg
S16	1,4,[5],12	i	1,2	Typhimurium	4,5,12	i	1,2	Typhimurium
S17	9,12	l,v	1,7	Kapemba	9,12	l,v	1,7	Kapemba
S18	1,9,12[Vi]	g,p	-	Dublin	9,12	g,p	-	Dublin
S19[b]	1,4,[5],12	i	-	1,4,[5],12:i:-	4,5,12	i	-	4,5,12:i:- (mST)
S20	28	i	1,5	Cotham	28	i	1,5	Cotham
S21[c]	41	z	1,5	II 41:z:1,5	41	z	1,5	41:z:1,5 (II)

[a] Represented in an EURL-*Salmonella* PT Serotyping for the first time.

[b] Monophasic variant of *S*. Typhimurium based on genomic sequences. Phenotypic result: 4,5:i:-.

[c] *Salmonella enterica* subspecies *salamae* (optional strain).

Remark Lab 12: *mST - monophasic Salmonella Typhimurium*

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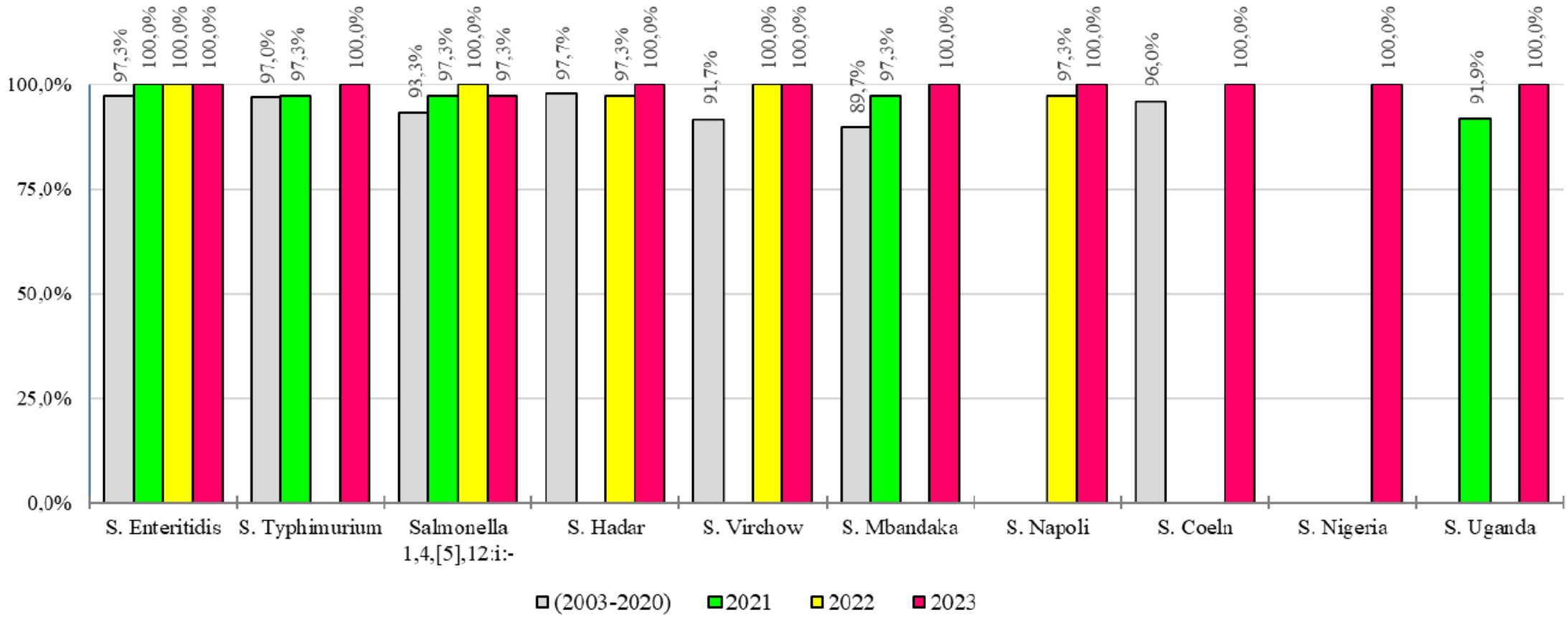
Overall PT performance – *Salmonella* identification



The percentage of correct results in proficiency testing conducted between 2003 and 2023 depending on the *Salmonella* serovar.

Cooperation with regional laboratories

- Diagnostic preparedness
- Confirmatory testing:
  - diagnostic laboratory
  - NRL
    - runs confirmatory testing (serotyping)
    - uses for other purposes i.e. AMR monitoring, outbreak investigations, general epidemiological studies

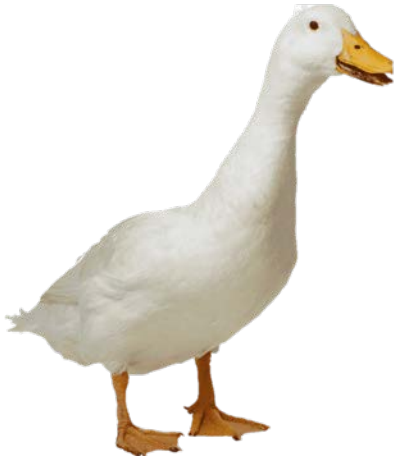
NRL *Salmonella* duties: Support to authorities

- Scientific and technical assistance to the Veterinary Inspection (GLW, WLW) i.e.:
  - contribution to the Country Profile recommendations
  - opinions on the characterization of *Salmonella* strains by genomic sequencing (in line with the CVO guidelines of January 2021)

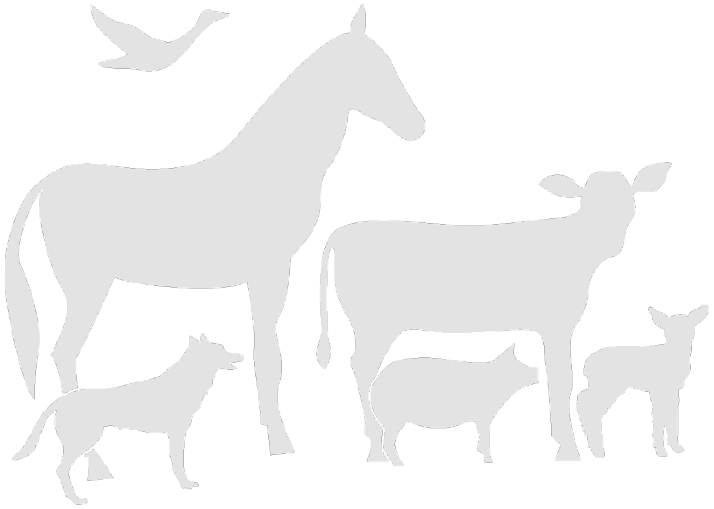
Salmonella activities in the regulated area

Other official monitoring programmes on *Salmonella*

- Consecutive Multiannual Program (currently 4th edition 2024-2028)
  - W/425 Assessment of the epidemiological situation of *Salmonella* infections in animals
    - hatcheries, pigs, cattle, waterfowl, companion animals
    - methodological approach similar to NSCP, rotatory (biannual) basis
  - W/316 (2019 – 2023)
- AMR monitoring of *Salmonella* isolated from imported fresh meat
- Official Feed Control Plan (*Salmonella* serotyping and AMR testing)



Department of Animal Feeding Stuffs National Veterinary Research Institute in Puławy (Poland)



Tomasz Grenda (on-line)

Activities

Our activities:

- If information is received from the EU Reference Laboratory regarding methods of detection and interpretation of *Salmonella* results, it is forwarded to the Chief Veterinary Officer and official laboratories.
- Organization of remote or stationary meetings for official laboratories resulting from current needs/results of proficiency tests.
- Providing current data on methods of microbiological testing of feed, providing ongoing consultations in accordance with the needs of the Veterinary Inspection authorities.
- Providing ongoing scientific and technical support in the scope of the coordinated program of official microbiological feed control, in particular assistance in the preparation of the draft annual plan for official feed control and the preparation and implementation of the national system for reporting the results of official feed control.

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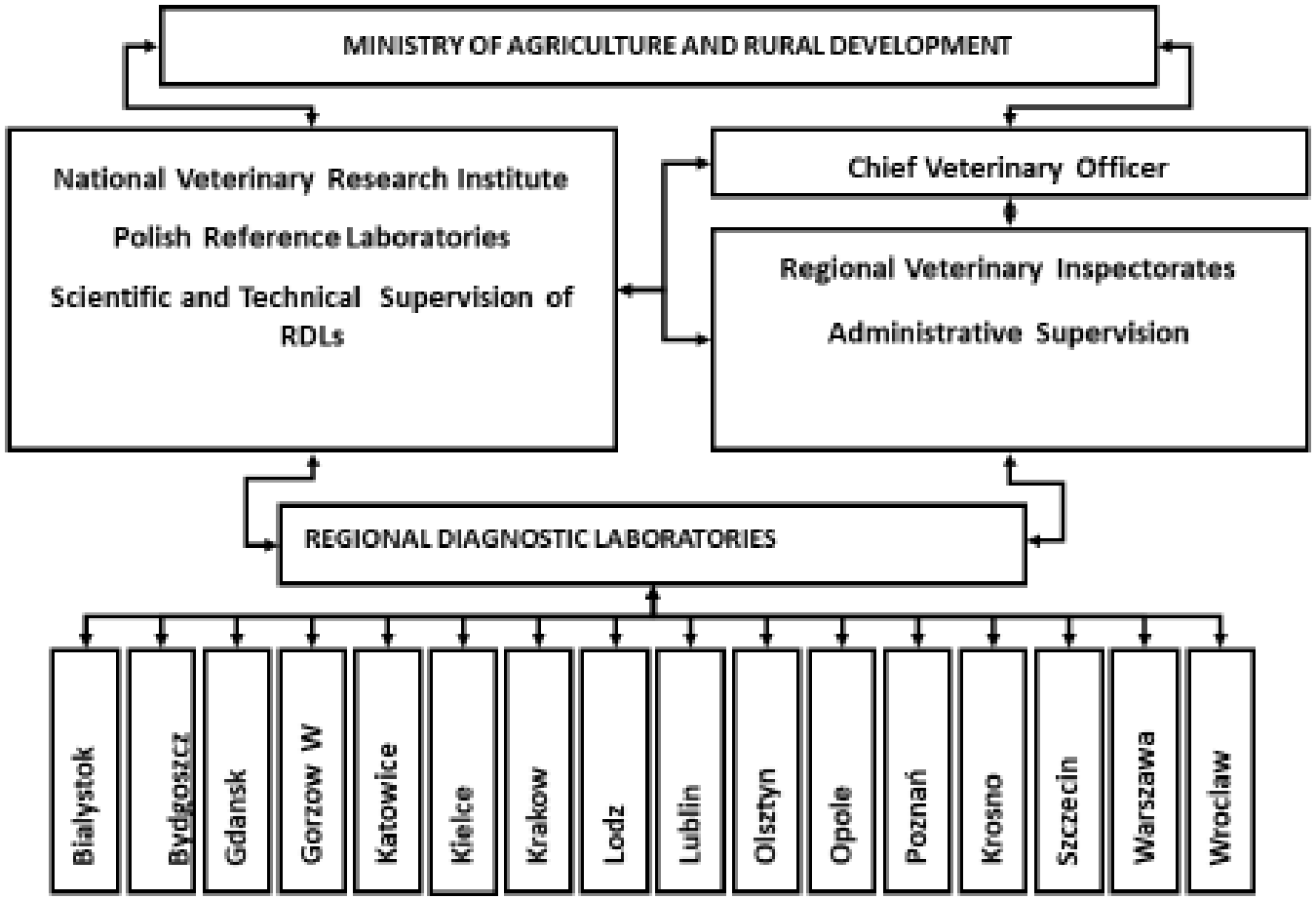
ORGANISATION OF VETERINARY LABORATORY DIAGNOSIS IN POLAND



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Proficiency Testing (PT) for *Salmonella* spp. detection

- The organizer of proficiency tests (PT) is the Department of Hygiene of Animal Feefing Stuffs of the National Veterinary Research Institute in Pulawy, which is the National Reference Laboratory for microbiological contamination of feed, by the Regulation of the Minister of Agriculture and Rural Development of July 27, 2022 on the national reference laboratories (Journal of Laws, Warsaw, August 27, 2022, item 1667).

- Department of Hygiene of Animal Feeding Stuffs has implemented a management system based on PN-EN ISO 17025, confirmed by accreditation certificate No. AB633.

- Reference (Recommended) method for the proficiency testing (PT): PN-EN ISO 6579-1:2017-04+A1:2020-09 Food chain microbiology - Horizontal method of detection, enumeration and serotyping of *Salmonella* - Part 1: Detection of *Salmonella* spp.

- Laboratories with implemented recommended as well as alternative Methods are evaluated.

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PT Results

- 2021:
- The 18 participants received consistent results for *Salmonella* in feed tested with the reference method;
- The 9 participants received consistent results for *Salmonella* in feed tested with the alternative method;

- 2022:
- The 28 participants received consistent results for *Salmonella* in feed tested with the reference method;
- The 11 participants received consistent results for *Salmonella* in feed tested with the alternative method;
- 2023:
- The 28 participants received consistent results for the presence of Salmonella in feed tested with the reference method and the 1 participant received inconsistent results;
- The 12 participants received consistent results for *Salmonella* in feed tested with the alternative method;

- Criteria of evaluation:
- SE - understood as compliance in terms of samples containing the target microbial agent
- SP - understood as compliance in terms of samples not containing the target microbial agent

- 100% - satisfactory result
- 90 – 60% - questionable result
- <60% - unsatisfactory result

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National Reference Laboratory (NRL) for *Salmonella* in food

Located at Department of Food Safety
of NVRI in Puławy

Kinga Wieczorek (on-line)

Responsibilities and tasks of NRLs

Responsibilities and tasks of NRLs (article 101 of Regulation 625/2017 of the European Parliament and of the Council):

……

(b) coordinate the activities of official laboratories

(c) organise inter-laboratory comparative testing or proficiency tests between official laboratories

……

(g) conduct training courses for the staff of official laboratories

Regional Veterinary Inspection laboratories

Official Regional Veterinary Inspection laboratories in 2024 - **19**

Official laboratories approved by CVO

Official laboratories approved by Chief Veterinary Officer in 2023 - **40**

Organization of Proficiency Tests (PT) for *Salmonella* or *S.* Typhimurium & *S.* Enteritidis

Year	Matrix	No. of participated laboratories	No. (%) of satisfactory results
2023	Swab	70	69 (98.6)
	Chicken meat	65	65 (100)
2022	Chicken meat	67	67 (100)
	Chicken meat*	55	52 (94.5)
2021	Chicken meat	62	57 (91.9)
	Chicken meat*	60	56 (93.3)
2020	Swab	59	56 (94.9)
	Sausage	56	56 (100)
2019	Beef meat	58	57 (98.3)
	Chicken meat*	50	48 (96.0)

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* *S.* Typhimurium and *S.* Enteritidis

Participation in Proficiency Tests (PT) for detection of *Salmonella* organized by EURL and other organizers

Year	No. of PTs	Organizer	Matrix	Results
2023	2	LGC Proficiency Testing, Bury, UK	Swabs	Satisfactory
		EURL-*Salmonella*, Bilthoven, NL	Food	Satisfactory
2022	1	EURL-*Salmonella*, Bilthoven, NL	Swabs	Satisfactory
2021	1	EURL-*Salmonella*, Bilthoven, NL	Food	Satisfactory
2020	2	EURL-*Salmonella*, Bilthoven, NL	Food	Satisfactory
		EURL-*Salmonella*, Bilthoven, NL	Swabs	Satisfactory
2019	3	EURL-*Salmonella*, Bilthoven, NL	Food	Satisfactory
		LGC Proficiency Testing, Bury, UK	Swabs	Satisfactory
		Health Security Agency, London, UK	Food	Satisfactory

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Participation in Proficiency Tests (PT) for serotyping of *Salmonella*

Year	No. of PTs	Organizer	Matrix	Results
2024	1	NRL for *Salmonella*, Poland	Bacterial strains	Satisfactory
2021	1	NRL for *Salmonella*, Poland	Bacterial strains	Satisfactory
2020	1	NRL for *Salmonella*, Poland	Bacterial strains	Satisfactory

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Thank you for your attention!

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NRL-*Salmonella* Activities

Food at retail and food of plant origin at the production stage

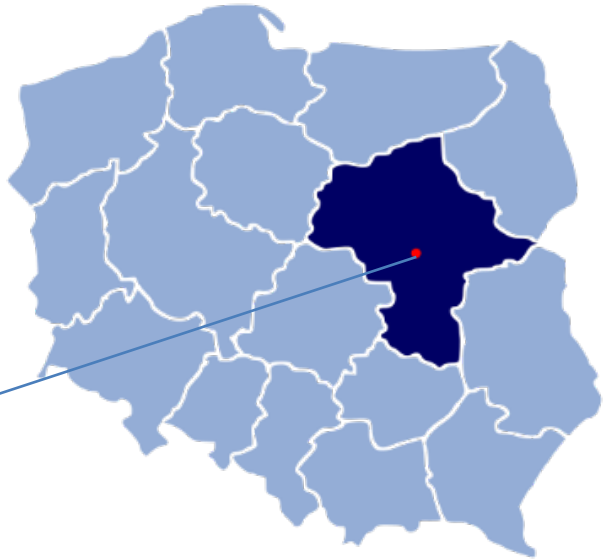
POLAND

EURL-Salmonella workshop 28-29.05.2024

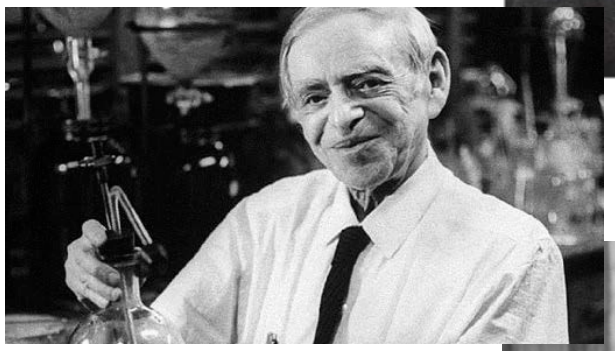
Elżbieta Maćkiw

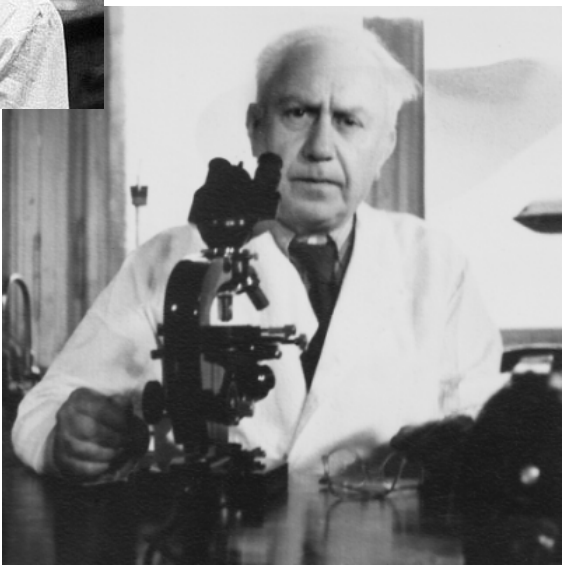
National Institute of Public Health NIH - National Research Institute NIPH NIH - NRI

Location: WARSAW



National Institute of Public Health NIH - National Research Institute NIPH NIH - NRI





The oldest public health institution in Poland - Established in 1918

<u>They worked at the institute:</u>

- **Ludwik Rajchman** - Director of the Health Section of the League of Nations, founder and first director of UNICEF
- **Kazimierz Funk** - discoverer of vitamin B1, introduced the term "vitamin„
- **Ludwik Hirschfeld** - introduced the names of blood groups A, B, 0

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Structure of NIPH NIH - NRI

Analysis and Strategies in Public Health

- Department of Health Promotion and Prevention
- Department of Monitoring and Analysis of Population Health
- Department of Health Situation Analysis
- Department of Education and Communication in Public Health

Epidemiological and Environmental Safety

- Department of Vaccine Safety and Vaccinations
- Department of Environmental Epidemiology
- Department of Epidemiological Threats Assessment
- Department of Microbiology and Biological Contamination Control
- Department of Virology
- Department of Parasitology and Vector-Borne Diseases
- BSL-3 Laboratory

Nutrition and Food Safety

- Department of Food Safety
- Department of Toxicology and Risk Assessment
- Department of Nutrition and Nutritional Value

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Food Safety Department

NIPH NIH-NRI is NRL for:

(Reg. of the Minister of Health of June 19, 2012)

- *Salmonella* spp.
- *Listeria monocytogenes*
- *Escherichia coli*
- coagulase-positive staphylococci
- *Campylobacter* spp.

Accreditation:

- ISO 17025 **Polish Centre for Accreditation** from 15th **July 2004**

- for *Salmonella* isolation and identification

PCA
POLSKIE CENTRUM AKREDYTACJI
BADANIA

AB 509

POLSKIE CENTRUM AKREDYTACJI
POLISH CENTRE FOR ACCREDITATION
PCA
Sygnatariusz EA MLA
EA MLA Signatory
CERTYFIKAT AKREDYTACJI
LABORATORIUM BADAWCZEGO
ACCREDITATION CERTIFICATE OF TESTING LABORATORY
Nr AB 509
Potwierdza się, że: / This is to confirm that:
NARODOWY INSTYTUT ZDROWIA PUBLICZNEGO – PAŃSTWOWY ZAKŁAD HIGIENY
ul. Chocimska 24, 00-791 Warszawa
spełnia wymagania normy PN-EN ISO/IEC 17025:2018-02
meets requirements of the PN-EN ISO/IEC 17025:2018-02 standard
Akredytowana działalność jest określona w Zakresie Akredytacji Nr AB 509
Accredited activity is defined in the Scope of Accreditation No AB 509
Akredytacja pozostaje w mocy pod warunkiem przestrzegania wymagań jednostki akredytującej określonych w kontrakcie Nr AB 509
This accreditation remains in force provided the Laboratory observes the requirements of Accreditation Body defined in the Contract No AB 509
Akredytacji udzielono dnia 15.07.2004 r.
Accreditation was granted on 15.07.2004

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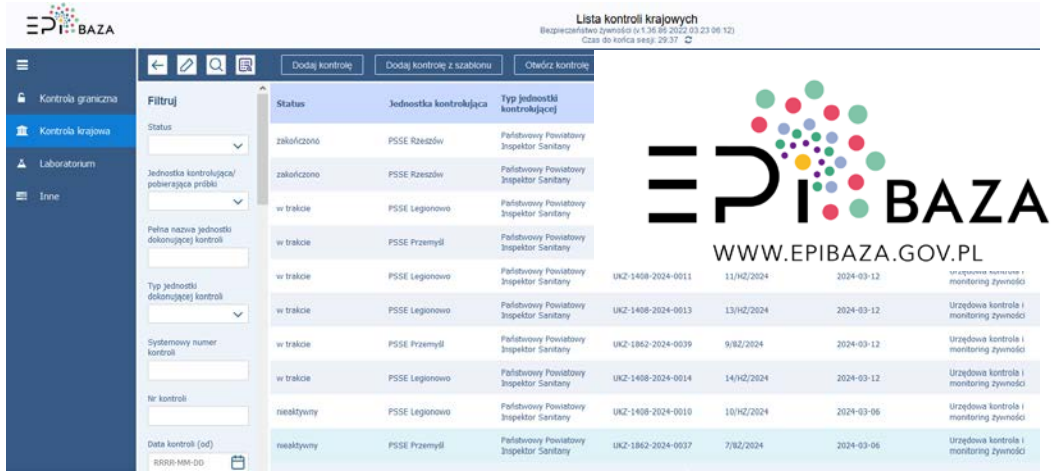
Activities of the NRL-*Salmonella*

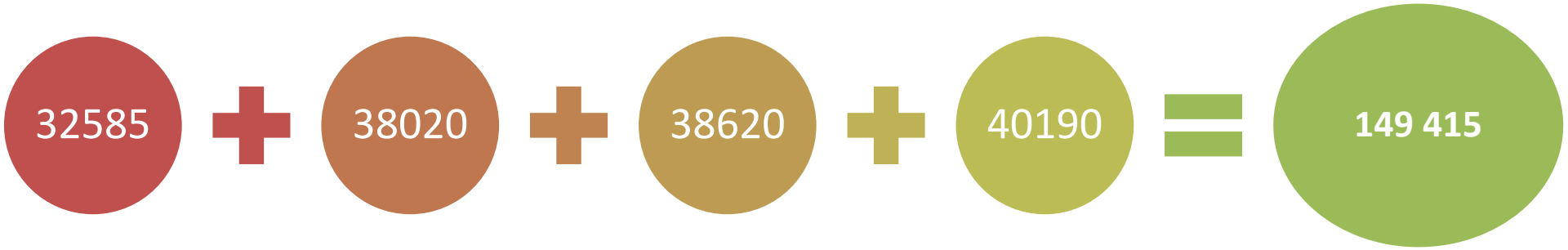
Food at retail and Food of plant origin at the production stage

- **Preparation and coordination of sampling plans for official food control and monitoring for Poland (in the EPIBAZA system using the FoodEx2 dictionary)**

✓ **54** accredited laboratories performing microbiological tests of food as part of official control at the Sanitary Inspection (**16** voivodeship laboratories and their local branches)

✓ **149 415** samples (in total): *Salmonella* tests in 2020-2023





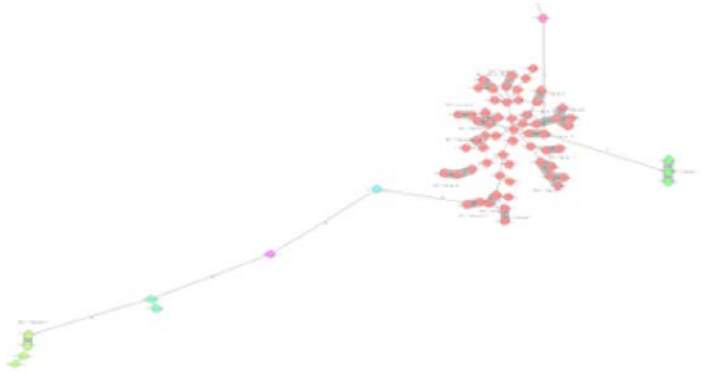
Activities of the NRL-*Salmonella*

Food at retail and Food of plant origin at the production stage

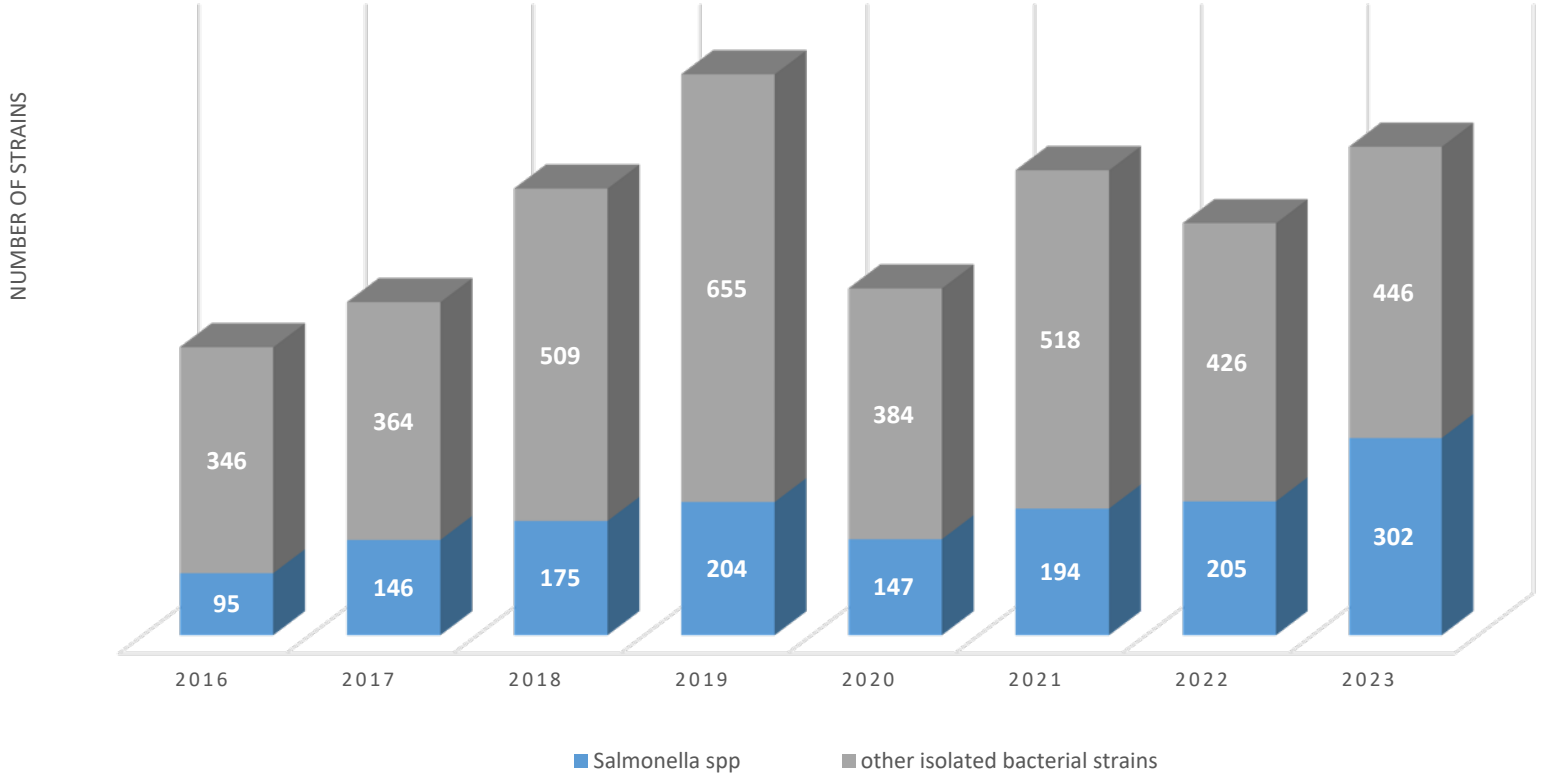
- confirmation and collection of isolates from the official control plan (NIPH NHI – NRI)

✓ collection of strains cataloged and stored at -70°C

✓ sequencing of selected strains (WGS)



Strains isolated from food, including strains of *Salmonella* spp., in Poland in 2016-2023



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Activities of the NRL-*Salmonella*

Food at retail and Food of plant origin at the production stage

- **Close cooperation with Official Food Control Laboratories:**

✓ Annual meetings for sharing information from EURL-*Salmonella*

✓ Training for the staff of Official Food Control Laboratories

✓ Annual audits of Official Food Control Laboratories conducting tests for the presence of *Salmonella* using an accredited method ISO 6579-1

✓ If required: Consultations with laboratories

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Activities of the NRL-*Salmonella*

Food at retail and Food of plant origin at the production stage

- **Advisory service**

✓ for the Ministry of Health

- Risk assessment of hazardous products for the RASFF system
- Participation in epidemiological investigations into *Salmonella* outbreaks

✓ for other institutions/organizations

- Inquiries and requests mainly regarding methods and epidemiology of *Salmonella*

- **Cooperation with the EURL-*Salmonella***

✓ Participation in the annual workshops

✓ Transferring requests regarding methodology and questions from laboratories

Activities of the NRL-*Salmonella*

Food at retail and Food of plant origin at the production stage

- Preparation of proficiency tests for Official Food Control Laboratories in the field of detecting the presence of *Salmonella* spp. (once every 4 years).

2022 Dried follow-on formulae

2018 egg powder

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Activities of the NRL-*Salmonella*

Food at retail and Food of plant origin at the production stage

- **Research/ Funded grants:**

✓ Grant from the National Centre of Science DEC-2011/01/N/NZ9/ 00197.„Resistance of *Salmonella* strains isolated from food to selected antibiotics and chemotherapeutics", (PhD thesis)

✓ Grant NIPH NIH – NRI (1B'ZBW/19). Thermal resistance of selected strains of *Salmonella* spp. isolated from eggs and sesame seeds. (LWT, 198, 2024)

✓ Norway Grants. Machine Learning-based systems for the automation of literature reviews in food safety domain (REFSA) NOR/POLNOR/REFSA/0059/2019-00

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Thank you for your attention!

Dziękuję

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