



An Roinn Talmhaíochta,
Bia agus Mara
Department of Agriculture,
Food and the Marine

National Reference Laboratory for Salmonella, Ireland

William Byrne
Presentation to EURL Salmonella workshop
28th May 2021

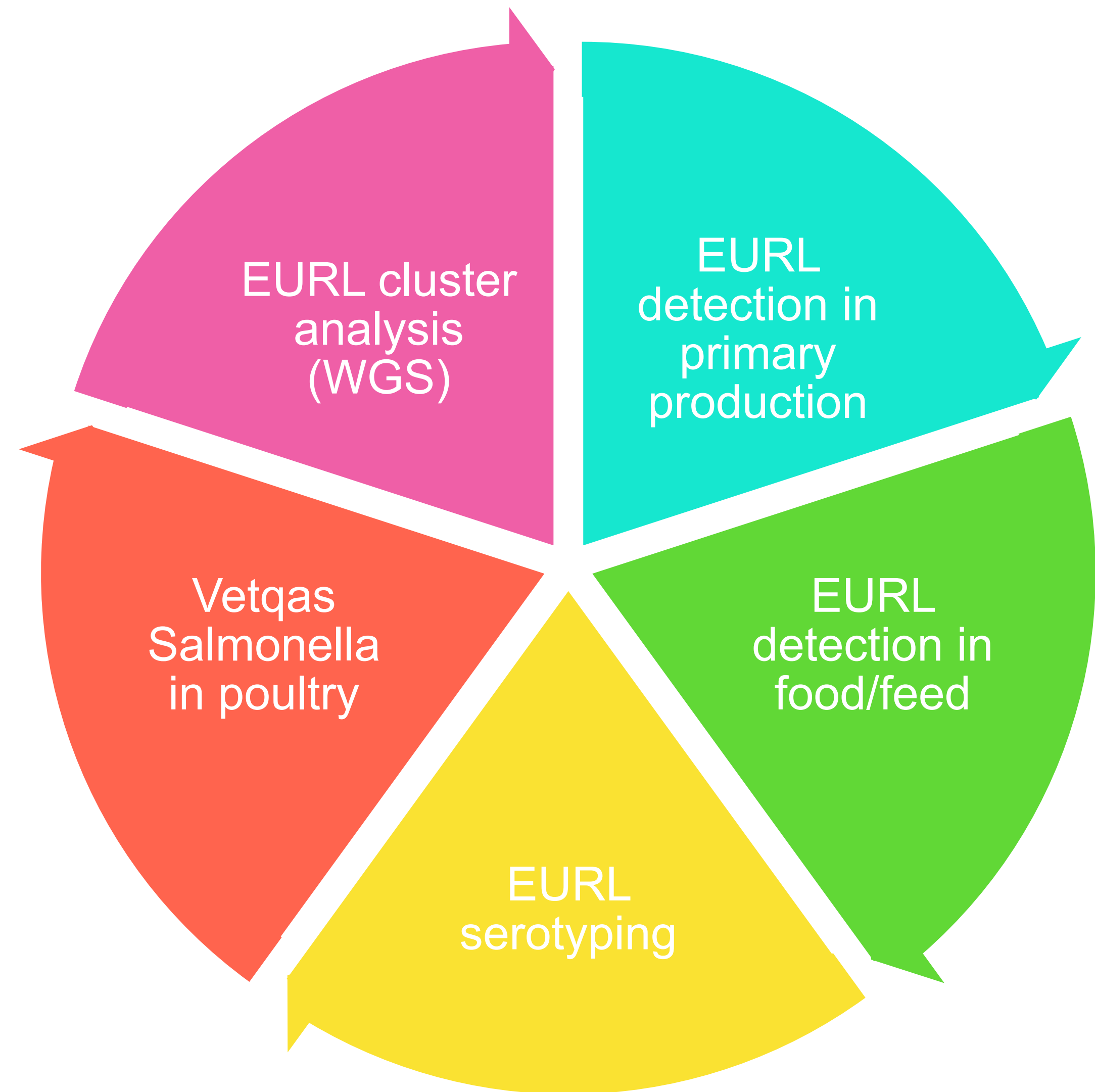


Photo: Peter Barrow, 28th November 2005, Tel: 0872-559638

DAFM Laboratory Backweston NRL Salmonella

- ISO 17025:2017 accreditation for
 - Detection method for the range of tested matrices
 - Maldi-ToF Salmonella and others
 - Serotyping by slide agglutination
 - PCR for ST and mST
 - Whole Genome Sequencing Salmonella and others
- ISO and Vidas methods for detection of Salmonella
- Planned validation/accreditation of ELISA for Salmonella in pigs (PrioCheck)

Proficiency Testing



Network of laboratories in Ireland

DAFM Laboratory Backweston

NRL Food, feed and animals in Ireland

Official testing laboratory: primary production, feed, hygiene processing samples from factories, animal by-products, food from DAFM supervised FBOs (meat, dairy, horticulture), imports of food of animal origin.

Other DAFM Laboratories

Regional Veterinary Laboratories specialised on animal health

Dairy Sciences Laboratories Limerick and Cork testing dairy food samples

NSSLRL in Galway- Reference laboratory for typing of human isolates and food isolates obtained by HSE and DoH Official laboratories

DoH Official testing laboratories - EHO samples from retail and FBOs under DoH supervision and FNAO imports

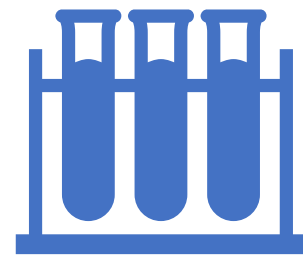
Authorised Private laboratories

Poultry primary production (Poultry Regulations)

Animal by-products

Other testing programmes

Supervision of laboratories



Official laboratories

Annual questionnaire

Common PT in food matrix

Those under DoH – Isolates sent to NSSLRL



Private laboratories

Approval (documented procedure)

Submission of isolates to DAFM NRL

Annual questionnaire

Common PT, Vetqas PT088

Lead on Investigations if necessary (one incident of revoking of approval)

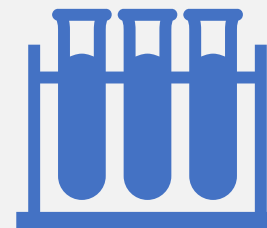
Annual questionnaire official laboratories



Contact Details



Methods of analysis, types of samples and reference strains and accreditation status



Proficiency testing details including results



Training/support needs

Common PT

We are not accredited for ISO 7043
Off the shelf PT's not always
suitable for all laboratories
Custom made PT's - cost is
prohibitive and the small number
of laboratories made it statistically
unsound
2021 first time to join the French
laboratories participation in the
BIPEA scheme



Guidance Document
for the organisation of Proficiency Tests by NRLs for national
networks, including partial outsourcing

Drafted by EURLs *Campylobacter*, Coagulase Positive Staphylococci, *Listeria*
monocytogenes, *Salmonella*, STEC

Version 2, 12/07/2019

	Test parameter	Matrix	Samples received by labs
Salmonella	Detection	minced meat	2 negative samples 6 samples with low-level contamination 1 sample with high-level contamination +1 sample either negative or with high-level contamination
LM	Detection	smoked salmon	2 negative samples 6 samples with low-level contamination 1 sample with high-level contamination +1 sample either negative or with high-level contamination
CPS	Enumeration	not determined yet (minced meat, shrimps or else.)	1 negative sample 1 sample with low-level contamination 1 sample with high-level

Private laboratories DAFM approved

DAFM Testing Programme	Approved Laboratory	Private Laboratory DAFM Approved Method	Types of samples DAFM approved for this Laboratory
Poultry Regulations (S.I. 706/2006, S.I. 247/2008, S.I. 64/2009, S.I. 99/2010, SI 565/2010)	Agrihealth Ltd t/a Agrihealth Laboratory Services Clones Road, Monaghan INAB 362T	MP01B: Detection and Isolation of Salmonella spp. by a Selective Enrichment Technique	Boot swabs, Faeces and Dust
		MP32 Detection of Salmonella spp. by the VIDAS UP (SPT) method and MP01B Detection and Isolation of Salmonella spp. by a Selective Enrichment Technique	Boot swabs, Faeces and Dust
	Alpha Analytical Services Ltd. Cappagh Cross, Fermoy, Cork INAB 237T	AAS.M.06: Detection of Salmonella species	Boot swabs, Faeces and Dust
	ALS Life Sciences t/a ALS Carrigeen Business Park, Clonmel, Tipperary INAB 166T	SP038 Method for the detection of Salmonella spp and SP178 Method for the confirmation of Salmonella spp	Boot swabs, Faeces and Dust
	Microlab Ltd. Monaghan Rd, Castleblayney, Monaghan Campden & Chorleywood - CLAS accredited Laboratory	ML024 Detection of motile Salmonella Method ISO6579 Annex D AND ML011 Confirmation of Salmonella	Boot swabs, Faeces and Dust
	Oldcastle Laboratories Ltd. Cogan Street, Oldcastle, Meath INAB 302T	TM2006: Isolation and identification of Salmonella	Boot swabs, Faeces and Dust
	Saotharlann Chonamara Teo t/a Complete Laboratory Solutions Rosmuc, Connemara, Galway INAB 108T	CLS 2: Detection of Salmonella spp. in food, foodstuffs, animal feeds, beverages and environmental samples e.g. swabs	Boot swabs, Faeces and Dust
	The Irish Equine Foundation Ltd. Johnstown, Naas, Kildare INAB 151T	P5.020: Isolation of Salmonella from poultry, (including primary production stage), poultry products and food samples	Boot swabs, Faeces and Dust

NRL for DEFRA Northern Ireland

- From 01/01/2021
- Animal health
- AFBI (former NRL) and private laboratories

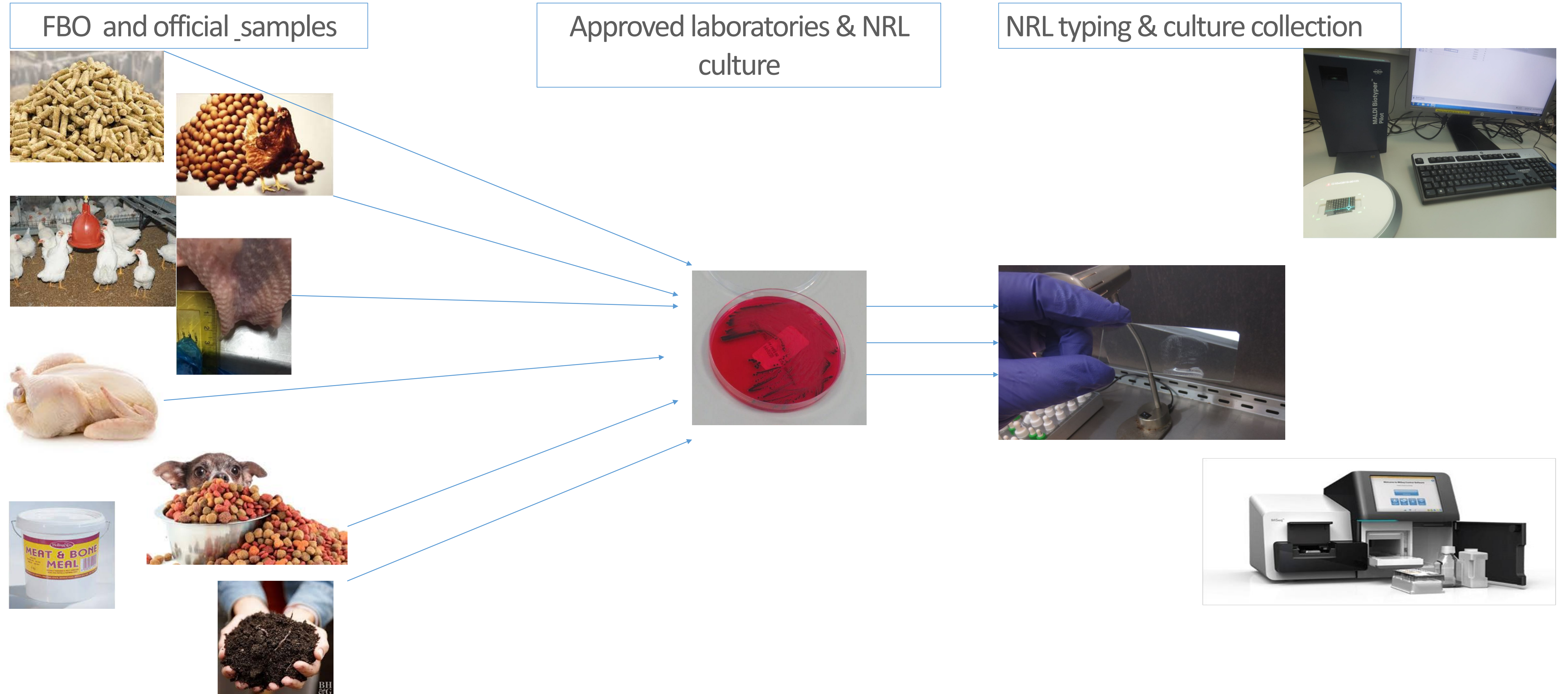
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Beechwood Laboratories	aidan@beechwood-laboratories.com	120 Ballymena Road, Doag Ballyclare BT39 0TL
Bio-Search (NI) Ltd	Jo.MacNamara@biosearch.co.uk	31 Dufferin Road Belfast BT3 9AA website: www.biosearch.co.uk
Mid-Antrim Laboratory Services	Pamela.mullan@moypark.com	42a Broughshane Road, Ballymena BT43 7DX
Moy Park Ltd	pamela.mullan@moypark.com	49 Seagoe Industrial Estate Craigavon Co Armagh BT36 5QE
Advanced Micro Services & Environmental Laboratories Ltd (ALS)	Margaret.buggy@alsglobal.com	Carrigeen Business Park, Clonmel, Co Tipperary, Ireland E91 PF63
Agrihealth Laboratory Services	mary.mckenna@agrihealth.ie	Clones Road, Monaghan, Ireland
Irish Equine Centre	microlab@irishequinecentre.ie jgibbons@irishequinecentre.ie	Johnston Naas Co Kildare Ireland W91 RH93
Alpha Analytical Services Ltd	laboratory@alphaanalyticalservices.ie	Caddagh Cross Fermoy Co Cork P61 VI26
SperrinTechnical Laboratories Ltd	info@sperrintechanical.com Dr Lorna Lawrence	7 Quilly Road Moneymore Co Londonderry BT45 7SE

NRL testing of official samples for *Salmonella* control programmes

- To detect *Salmonella* spp. in **broilers, broiler breeders, layers, turkeys and turkey breeders**
- Testing to assess **Process Hygiene Criteria** re *Salmonella* in primary processing plants, poultry and pigs
- *Salmonella* testing for controls on; **Tallow and greaves, animal feed, animal by-products, compost, pet food**



Typing of FBO own check *Salmonella* spp. isolates



Salmonella spp. detection results of official on-farm poultry flock samples

Category of poultry	EU legislation	National legislation
Broiler Breeders (Parents & Grandparents)	Commission Regulation (EU) No 200/2010	100% flocks (>250 birds) x 3 times per year
Commercial broiler chickens	Commission Regulation (EU) No 200/2012	10% flocks (> 5,000 birds)
Turkey breeders	Commission Regulation (EU) No 1190/2012	100% flocks (>250 birds) once per year
Turkey fatteners	Commission Regulation (EU) No 1190/2012	10% flocks (> 500 birds)
Table egg layers	Commission Regulation (EU) No 517/2011	100% flocks (>1,000 birds)

Official sampling and testing programme for flocks of *Gallus gallus* and turkeys

Flock type	Detected	Not Detected	Total
Broiler		110	110
Broiler Breeder		806	806
Layer	1*	422	423
Layer breeder		24	24
Turkey		56	56
Turkey Breeder		8	8
Total	1	1426	1427

Salmonella spp. detection results for official on-farm chicken (*Gallus gallus*) and turkey samples in 2020

*S. Kentucky in one layer flock

All official on-farm flock sample cultures were negative for “target” serovars in 2020

NRL collates results of *Salmonella* spp. isolates and their serotypes arising from FBO own checks & official testing

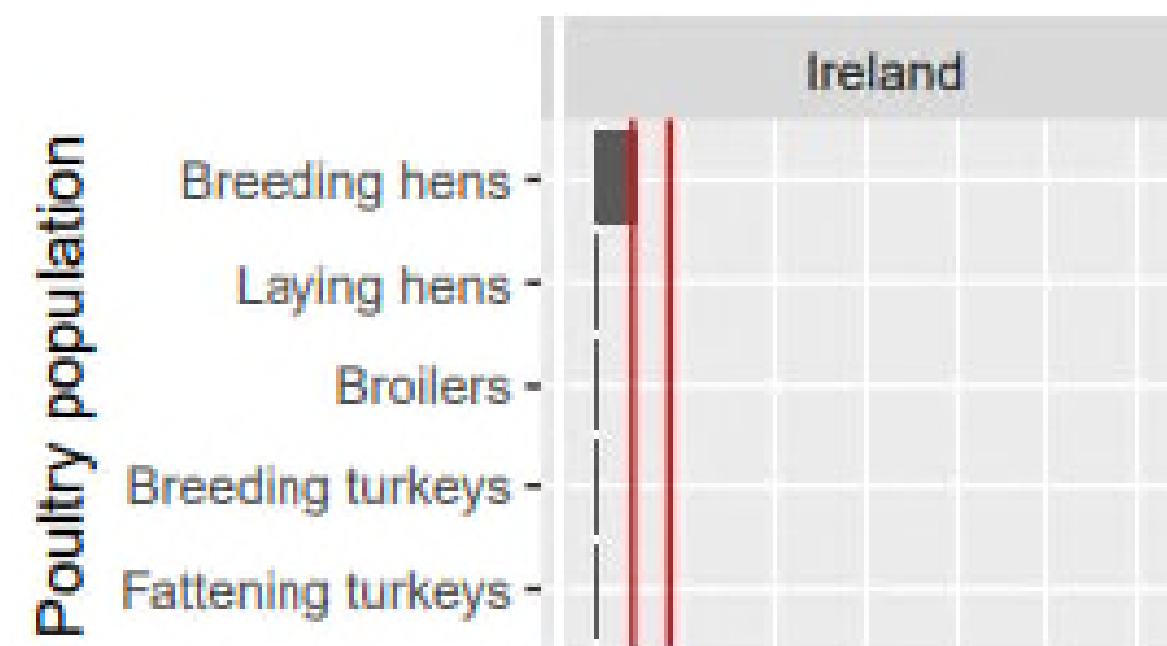
Flock type & isolate serotype	Number of isolates
Breeder	1
Salmonella Llandoff	1
Broiler	7
Salmonella Braenderup	3
Salmonella Llandoff	2
Salmonella Livingstone	1
Salmonella Newport	1
Broiler Breeder	2
Salmonella Agama	2
Layer	5
Salmonella Bardo	1
Salmonella Kentucky	1
Salmonella Llandoff	3
Turkey	12
Salmonella Bardo	2
Salmonella Derby	2
Salmonella Senftenberg	8
Total	27

Salmonella isolates by serotype from chicken (*Gallus gallus*) or turkey flocks from on-farm samples collected by DAFM or FBOs in 2020

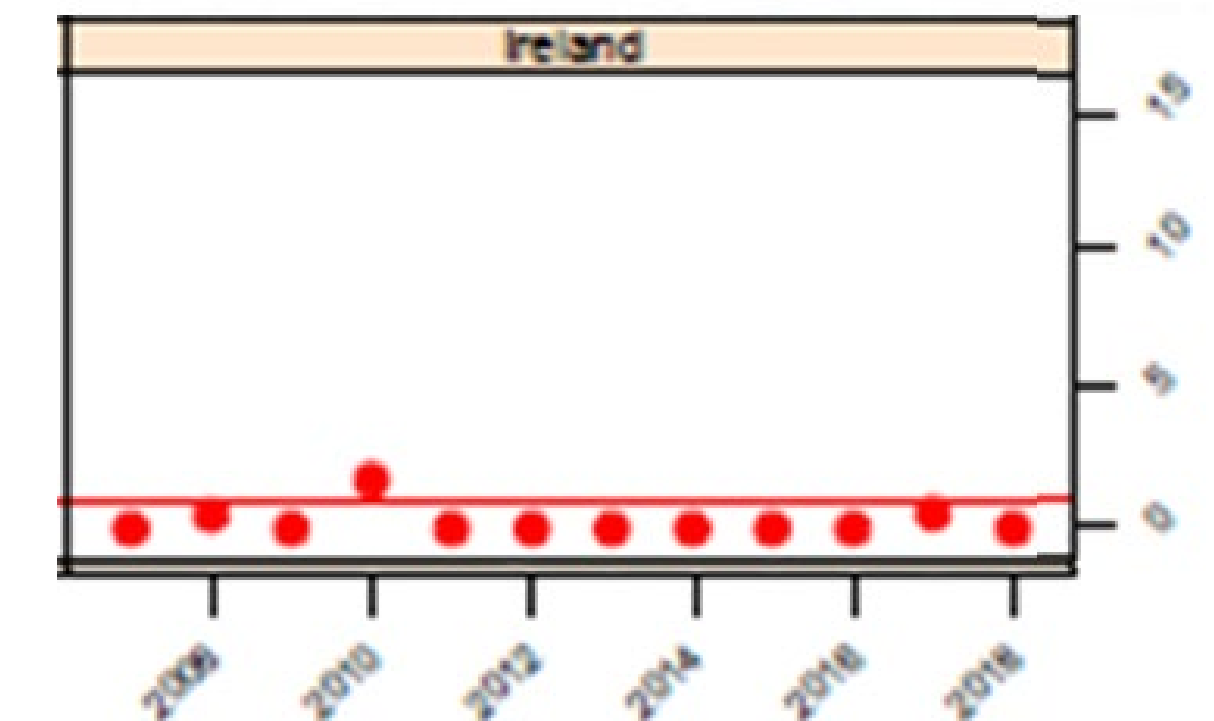
- All FBO and official poultry flock sample isolates were negative for target serovars in 2020
- All poultry PHC samples were negative for SE and ST in 2020

Poultry Meat type and Salmonella serotype	Number of isolates
Chicken	3
Salmonella Braenderup	1
Salmonella Livingstone	2
Duck	24
Salmonella Brandenburg	19
Salmonella Infantis	4
Salmonella Schwarzengrund	1
Total	27

Number of Salmonella isolates from FBO and official poultry PHC neck skin samples in 2020



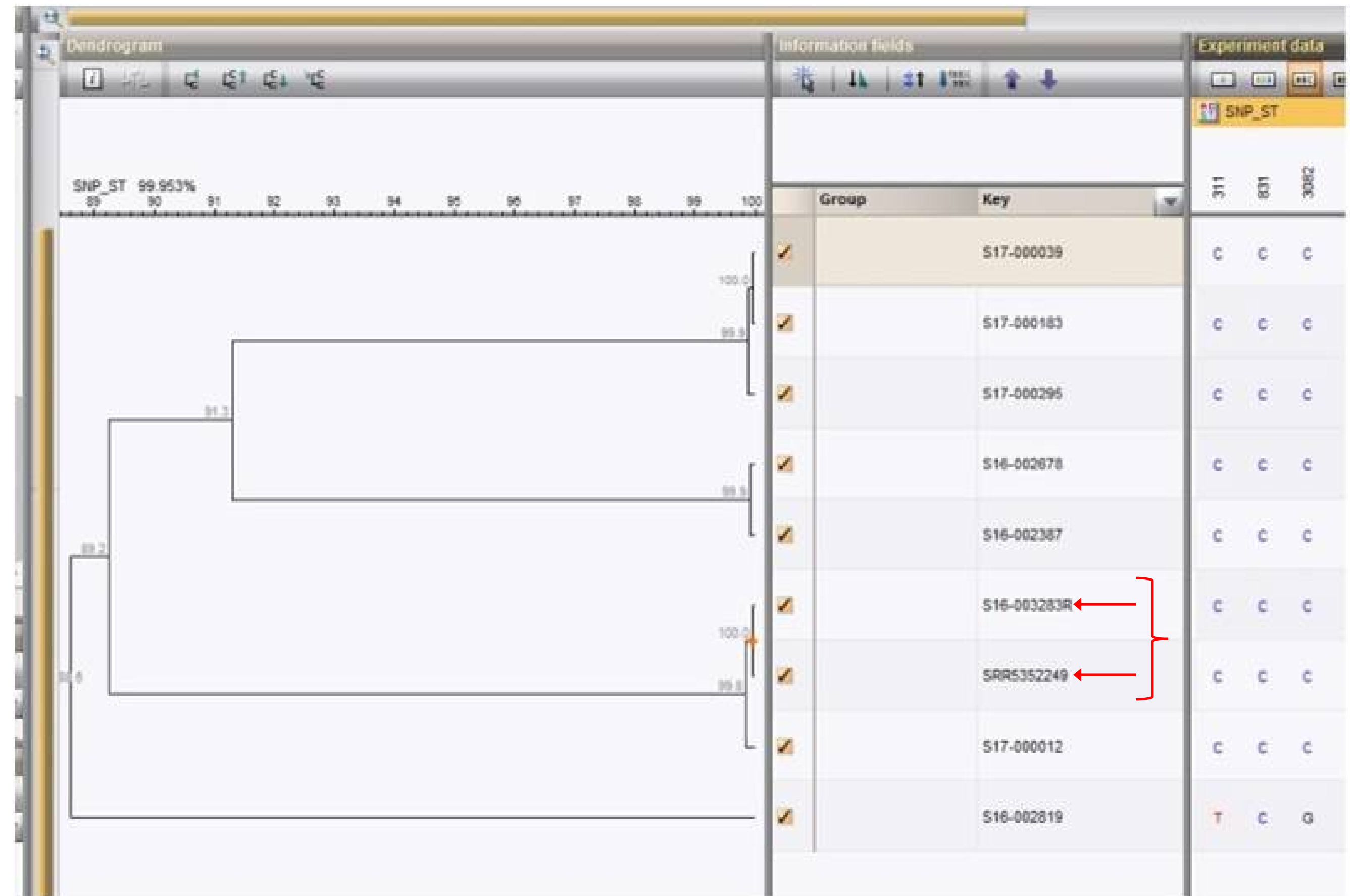
Prevalence of target Salmonella serovars in poultry flocks in 2019, Ireland



Prevalence of target Salmonella serovars in Broiler breeder flocks 2007 – 2018, Ireland

NRL assists Competent Authority in investigation of outbreaks – Example 1

- Nov 2016 - *Salmonella* Typhimurium isolated from duck egg laying flock in Wexford.
- Irish visitor to Cardiff - hospitalised with enteritis - *Salmonella* Typhimurium isolated
- Questionnaire - Duck eggs consumed before departure from Wexford
- Public Health England - WGS of human isolate – uploaded to NCBI database
- NRL *Salmonella* - WGS of duck flock isolates – SNP cluster analysis

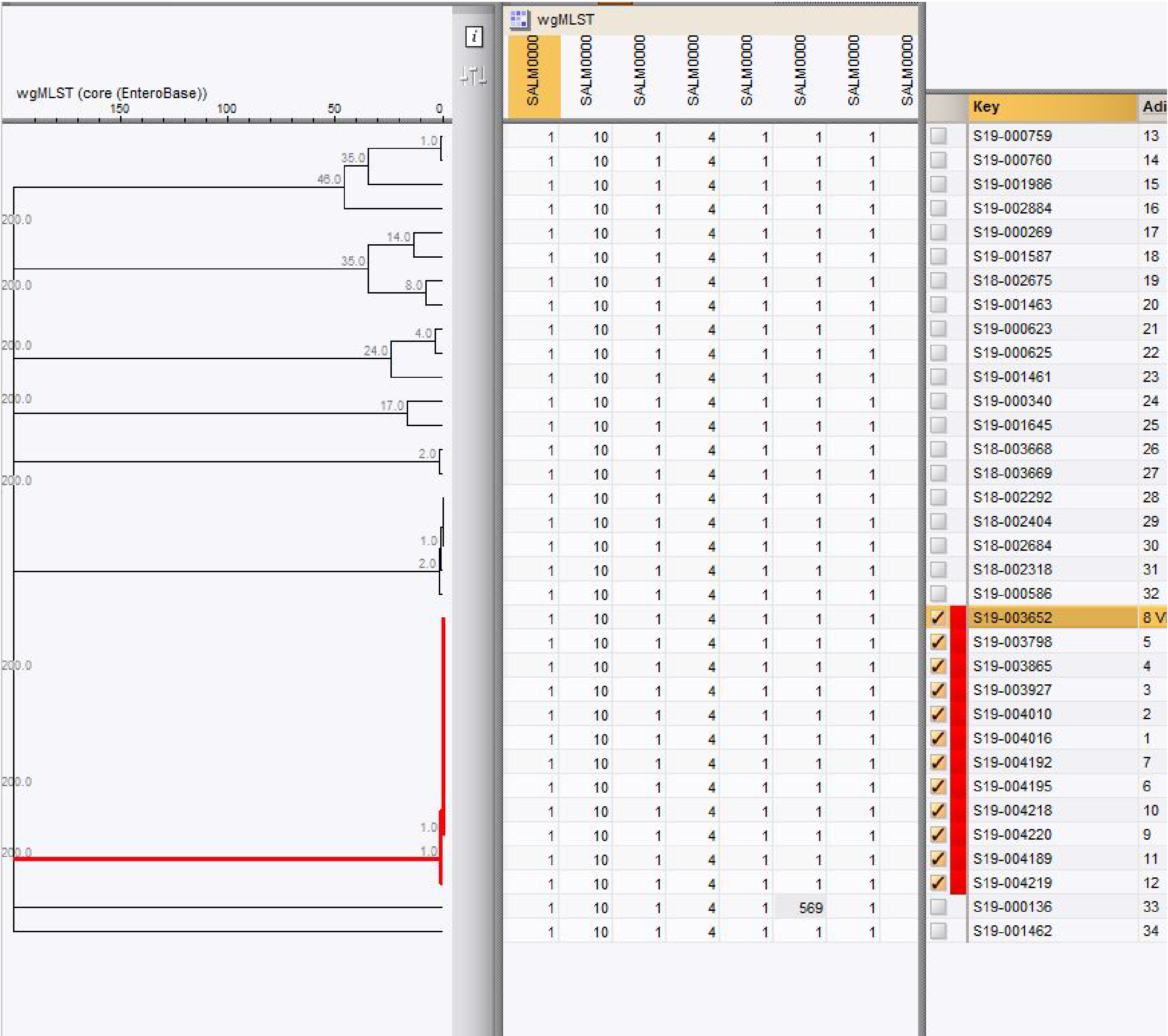


Investigation of suspected *Salmonella* Typhimurium outbreak, 2019

Example 2

- November 2019 – NRL received series of *Salmonella spp.* isolates for serotyping - attributed to *Gallus gallus* flocks from one approved laboratory
- Serotyped – *Salmonella* Typhimurium
- Flocks restricted
- Isolates sequenced – compared cgMLST of ST strain with recent ST isolates

Dendrogram of cgMLST of S. Typhimurium isolates from private laboratory and from PT distribution and from database of sequenced isolates



← PT strain ST

Private laboratory isolates

Investigation of suspected *Salmonella* Typhimurium outbreak, 2019

Example 2

- November 2019 – NRL received series of *Salmonella spp.* isolates for serotyping - attributed to *Gallus gallus* flocks from one approved laboratory
- Serotyped – *Salmonella* Typhimurium
- Flocks restricted
- Isolates sequenced – compared cgMLST of ST strain with recent ST isolates –
- Clonally related strain of recent PT strain
- Flocks re-sampled, all negative for *Salmonella* -> restrictions withdrawn
- All remaining suspected flocks re-sampled again – all negative (except for 2 broiler breeder pullet flocks – restricted and culled)
- Audit of laboratory
- All poultry flocks in Ireland negative for *S. Typhimurium* throughout 2020
- All poultry PHC samples negative for *S. Typhimurium* throughout 2020

Acknowledgments



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DAFM colleagues

EFSA / ECDC One Health Zoonoses Report
authors

PHE England colleagues



Questions ?