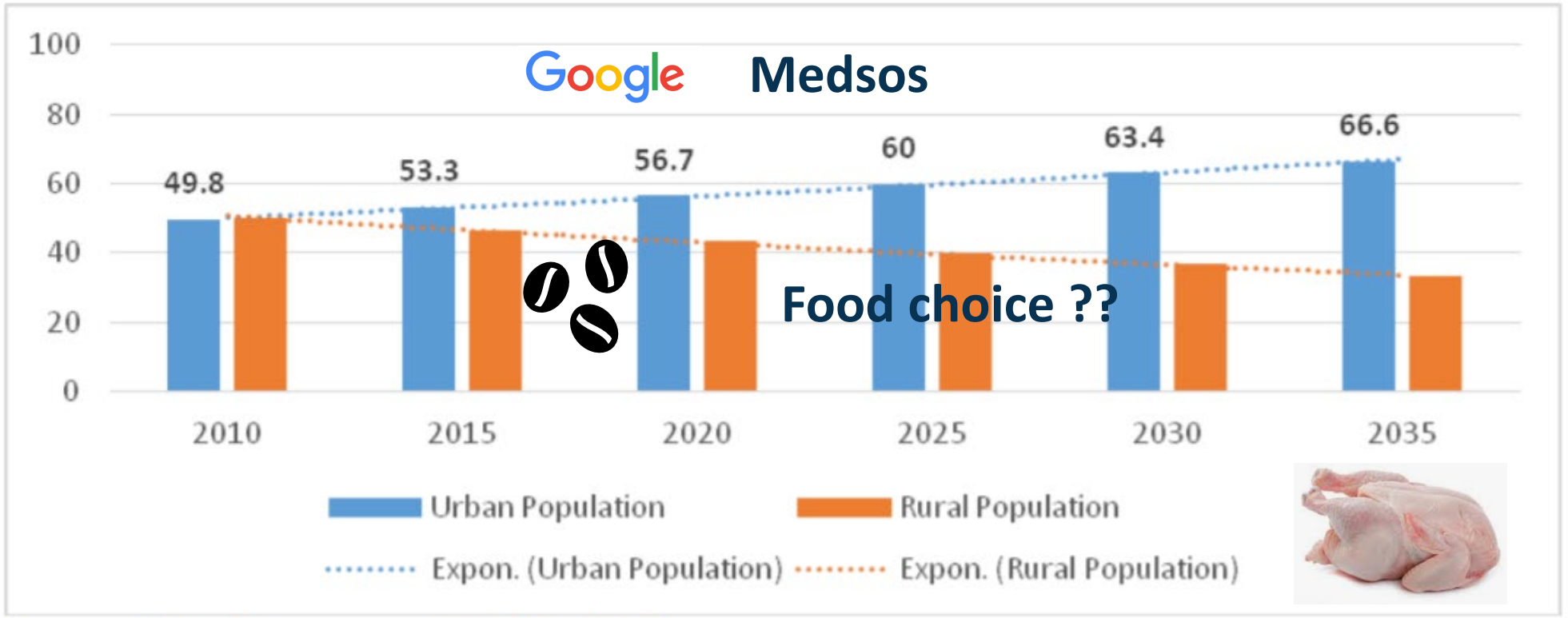
Pengendalian Salmonella sp Untuk Menghasilkan Produk Unggas yang Aman dan Sehat

Drh. Agus Prastowo

Urbanisasi

1. Kotoran kerabang
2. Warna kerabang

3. Add value – omega 3
4. Food safety brand

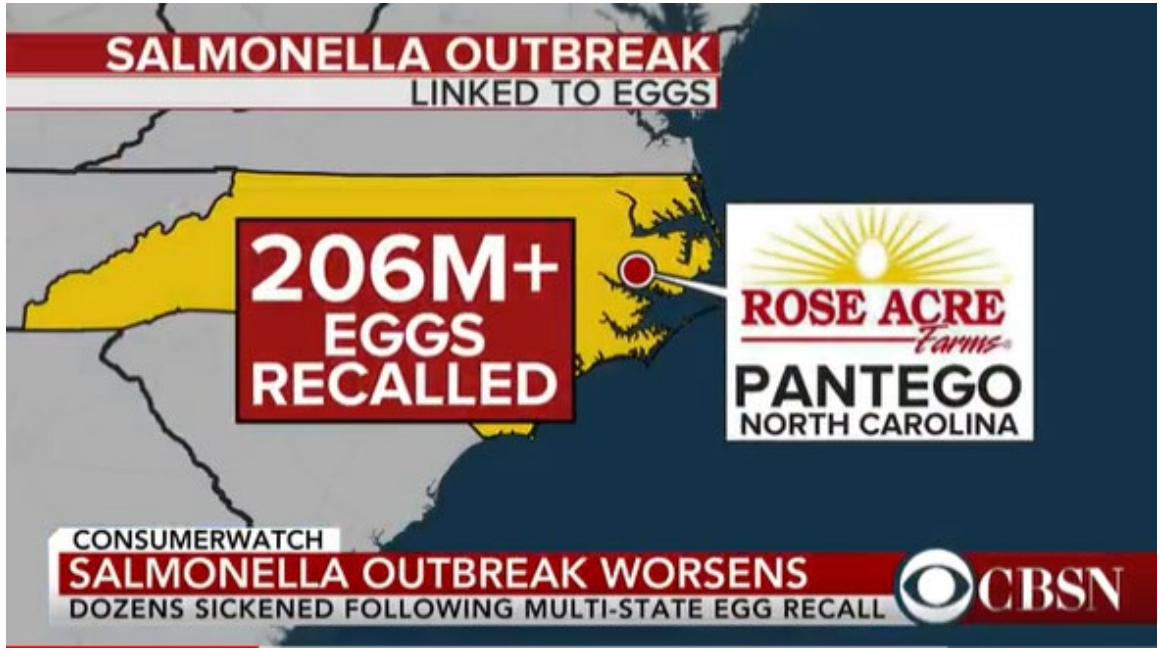


Source: BPS, Bappenas, UNFPA, 2014

- ❑ Suplai pangan
- ❑ Keamanan pangan

1. Wet market
2. Retails

Salmonella kasus !!!



- 94 % berasal dari makanan
- **Salmonella <10 cells , high fat**

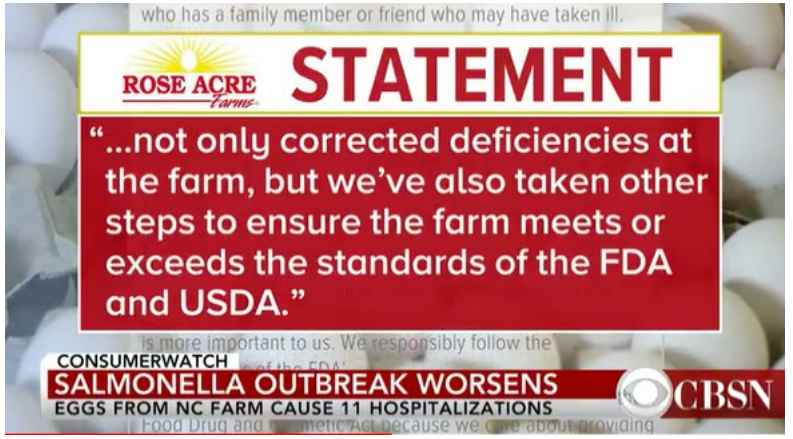


Table 1. Host Animals for Common *Salmonella enterica* Serotypes

Salmonella enterica Serotype	Host Animals	Disease in Humans?
Enteritidis	Humans, poultry, wild rodents	Gastrointestinal
Typhimurium	Humans, cattle, swine, horses, sheep, poultry, wild rodents	Gastrointestinal
Newport	Cattle, humans	Gastrointestinal
Gallinarum	Poultry	None or rare
Pullorum	Poultry	None or rare
Dublin	Cattle, swine, sheep	Gastrointestinal
Typhi	Humans only	Typhoid fever
Paratyphi	Humans only	Typhoid fever

Sources: Baumler *et al.*, 1998, Chen *et al.*, 2013, Toth *et al.*, 2011

Lion Code – Garuda Code ?

Salmonella outbreak linked to British eggs

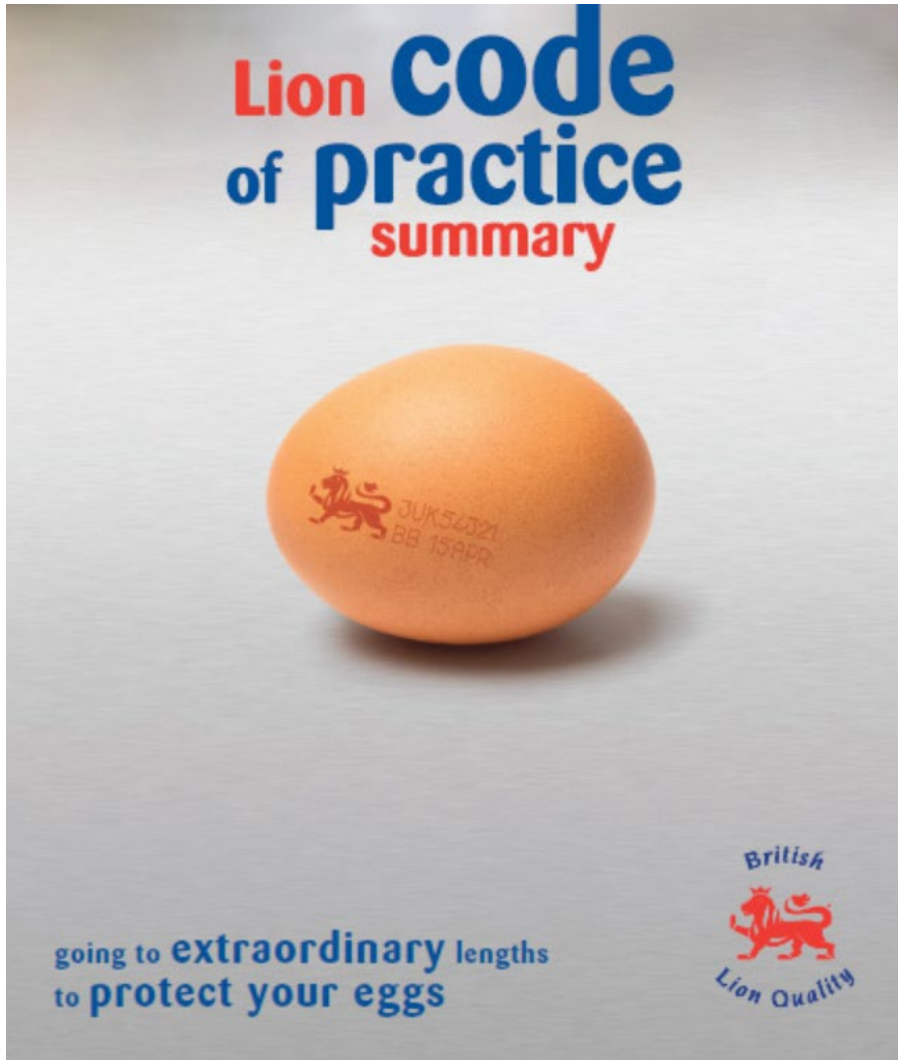
By Joe Whitworth on July 9, 2020

Almost 40 people are part of a Salmonella outbreak traced to eggs from the United Kingdom.

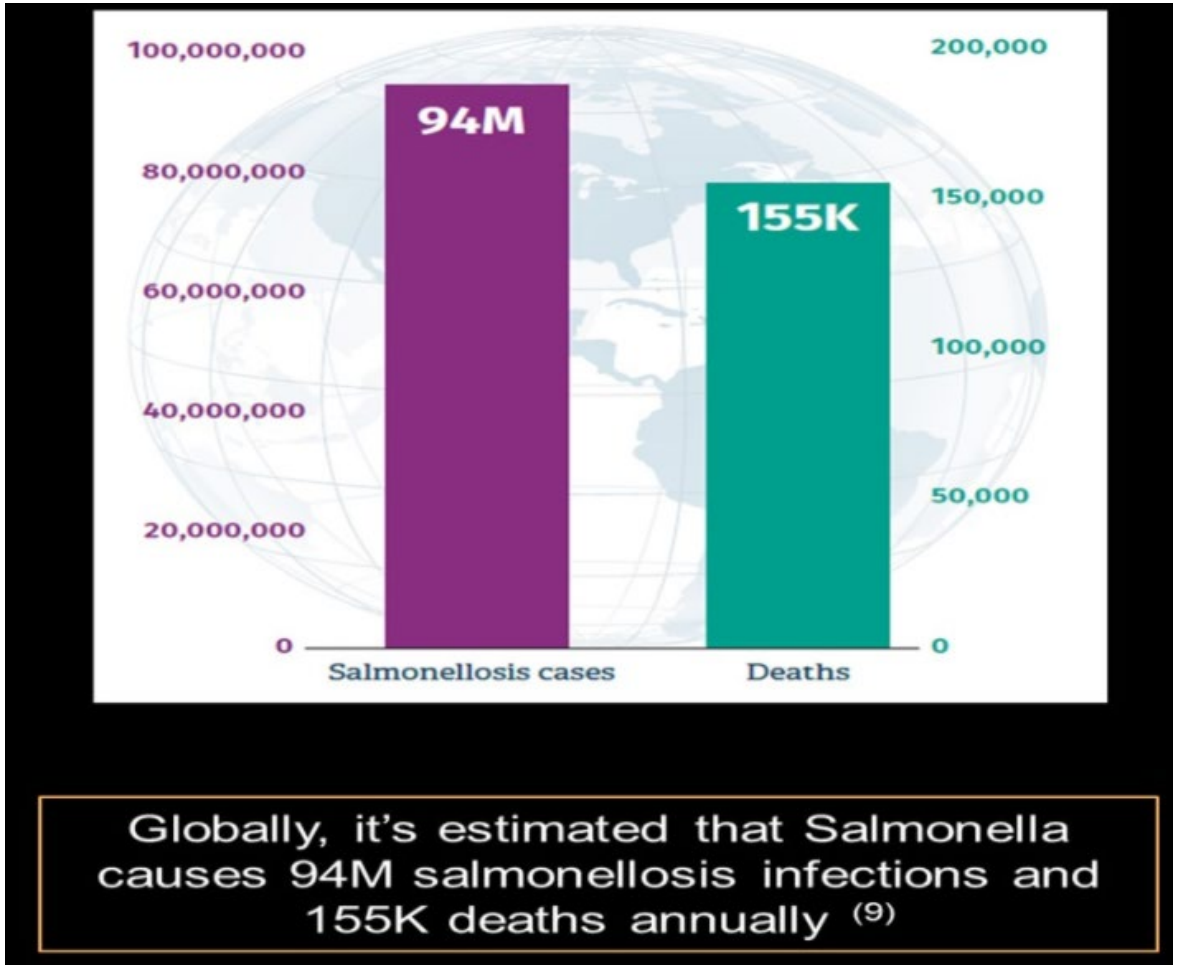
A spokesman for Public Health England told **Food Safety News** that it does not hold information on the date of onset of illness for all the patients.

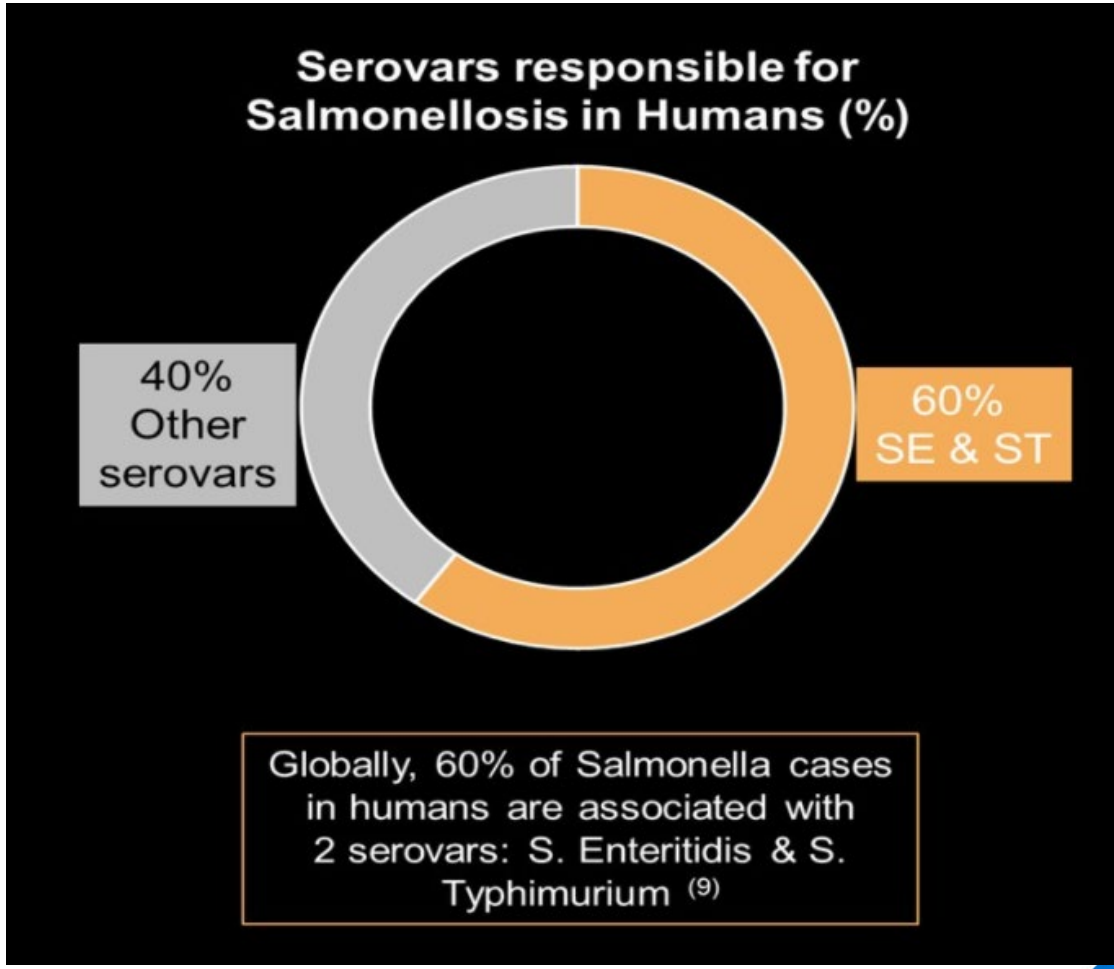
"There have been 38 reported cases linked to this incident through analysis of whole genome sequencing data. Cases range in age from 6 months to 85 years; 19 are female and 19 are male. We are aware of two cases having been hospitalized," the spokesman said.

British Lion Brand eggs account for about 90 percent of UK egg production. The British Lion mark on eggs means that they have been laid by hens vaccinated against Salmonella. All eggs with this mark have been produced under requirements of the British Lion Code of Practice.



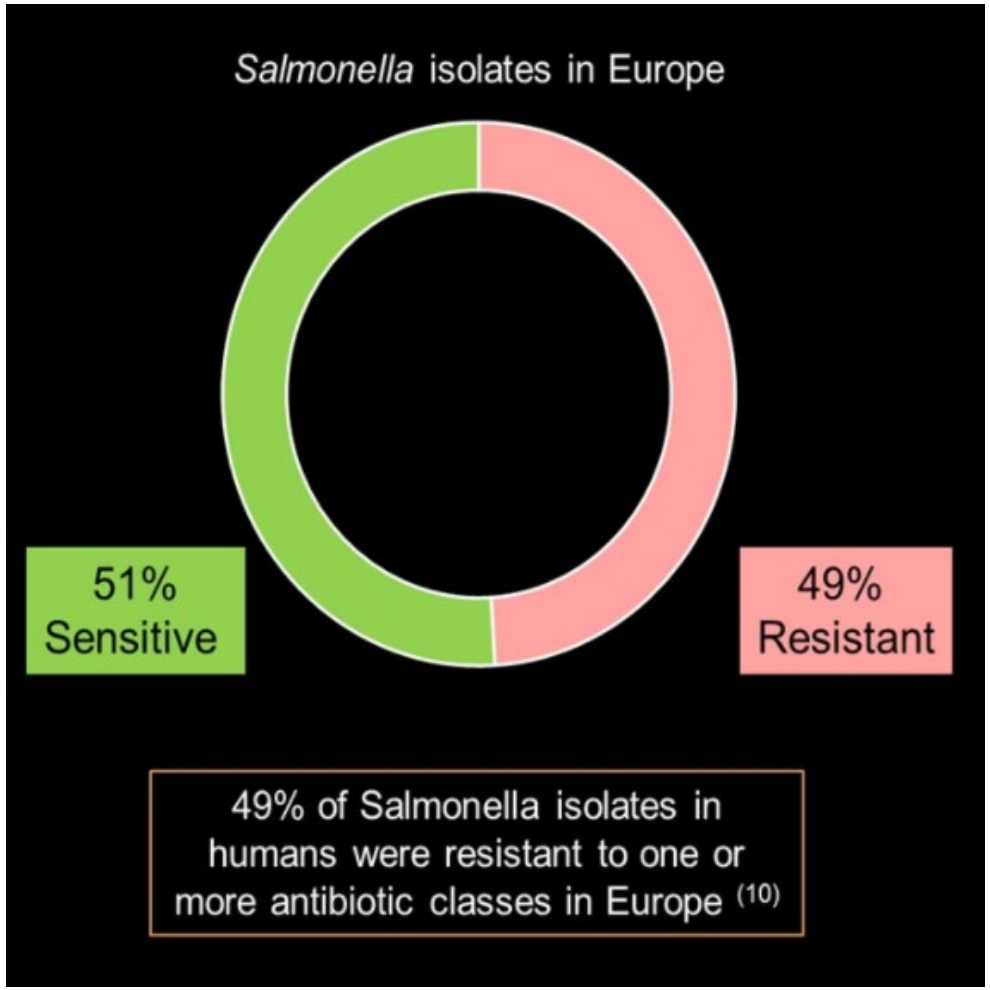
Global kasus – serovar Salmonella





9) Hendriksen RS et al Foodborne Pathogens and Disease 2011

Kondisi secara umum



- AGP klaim dicabut
- Isu resistensi - AMR (*E Coli, Salmonella, Camphylobacter*)
- Shared class Abx – Non-Shared class (Animal use only Abx)

(10) European Commission. The European Union summary report on antimicrobial resistance in zoonotic and indicator bacteria from humans, animals and food in 2016. EFSA Journal. 2018;16(2):5182

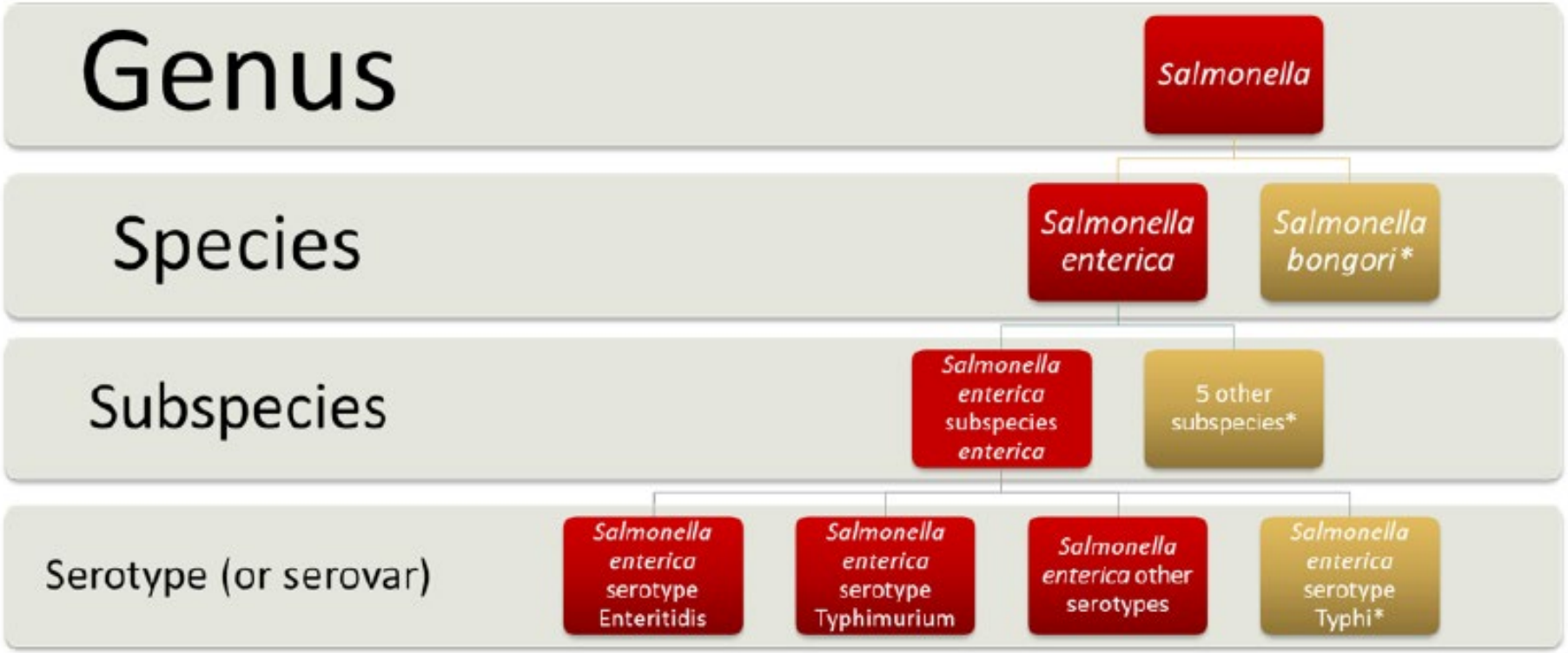


Figure 1. Nomenclature within the *Salmonella* Genus

**Salmonella* categories not typically associated with foodborne disease are denoted with asterisks.

Somatic Antigens

Serogroup "O"	Serovar	"O" Antigen	"H" Antigen
A	*S.* Paratyphi A	1, 2, 12	a
B	*S.* Typhimurium	1, 4, 5, 12	i, 1, 2
C_1	*S.* Infantis	6, 7	r, 1, 5
C_2	*S.* Newport	6, 8	e, h, 1, 2
D	S. Enteritidis	1, 9, 12	g, m
	S. Gallinarum	1, 9, 12	
	S. Pullorum	(1), 9, 12	
	S. Typhi	9, 12, Vi	d
E_1	*S.* Anatum	3, 10	

Serogroups and Serovars Important to Public Health

Group B	Group D	Group C	Group E
Typhimurium (biphasic,monophasic)	Enteritidis	Infantis	Senftenberg
Heidelberg	Gallinarum	Newport (c2)	Give
Java	Pullorum	Hadar (c2)	London
Paratyphi B	Javiana	Paratyphi C	Meleagridis
Limete	Dublin	Cholerae-suis	Cambridge
Agama	Ndolo	Typhi-suis	Newington
Agona	Panama	Ohio	Minneapolis
Brandenburg	Miami	Blockley	Lexington
Bredeney	Sendai	Menston	Simsbury
Derby	Typhi	Oranienburg	Anatum
Saint-paul	Miami	Thompson	Muenster
Salinatis	Dublin	Kentucky (c2)	Binza/Orion
Stanley	Moscow	Montevideo	Oxford
Schottmülleri	Jamaica	Thompson	Benfica
Indiana	Portland	Livingstone	Amsterdam
Reading	Panama	Mbandaka	Freiburg
Duisburg	Israel	Virchow	Stockholm

(4) WHOCC-Salm Institut Pasteur. 2007, 9th edition REF-01023 ANTIGENIC FORMULAE OF THESALMONELLA SEROVARS

EU *Salmonella* Surveillance System

By Poultry species

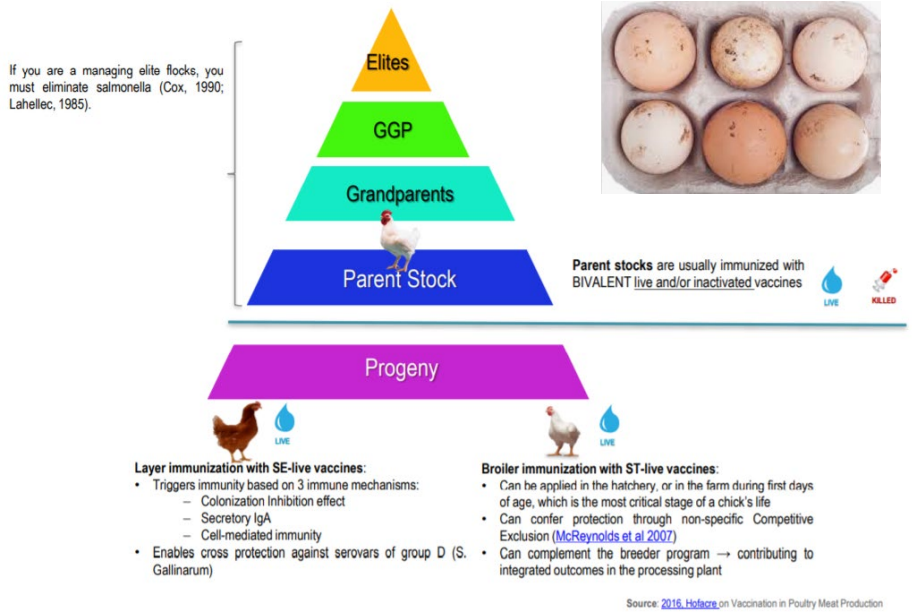
Animal & Plant Health Agency




	Breeding chickens	Laying chickens	Meat production chickens -Broilers	Fattening and Breeding Turkeys
Regulation	(EC) No. 200/2010	(EC) No. 517/2011	(EU) No. 200/2012	(EU) No. 1190/2012
Target	<1% flocks positive for top 5 serovars: Enteritidis, Typhimurium, Hadar, Infantis and Virchow	Annual % reduction from baseline or to <2% flocks positive for S. Enteritidis and Typhimurium	<1% flocks positive for Enteritidis and Typhimurium	<1% flocks positive for Enteritidis and Typhimurium
Implementation	Effective since 2007	Effective since 2008	Effective since 2009	Effective since 2010
Sampling	Option farm or hatchery: • Operator sampling - every 2 or 3 weeks during production (derogation) • Official sampling – 2 or 3 x in every flock (derogation)	• Operator sampling - every 15 weeks starting at 22 – 26 weeks age • Official sampling – 1x flock on premises >1000 birds • [Official suspect sampling following +ve SE/ST]	• Operator sampling – all flocks within 3 weeks of slaughter (derogation) • Official sampling – 1x flock on 10 % premises >5000 birds	• Breeding turkeys as for breeding chickens • Fattening turkeys operator sampling - as for broilers (no derogation) • Fattening turkeys official sampling – 1x flock on 10 % premises >500 birds
Aim	Prevent spread of infection to production poultry/down food chain via hatching eggs	Detection of infection and egg marketing restrictions	Detection of infection and limit contamination of poultry meat ('absence of Salmonella in 25g fresh meat')	As for breeding chickens and broilers

Kontrol Salmonella

1 Proteksi di PS terhadap salmonella – **VT**



Coccidiosis
Dysbacteriosis – NE

2 Proteksi flock dari infeksi

Higiene farm : Sanitasi & Disinfeksi – Biosecurity

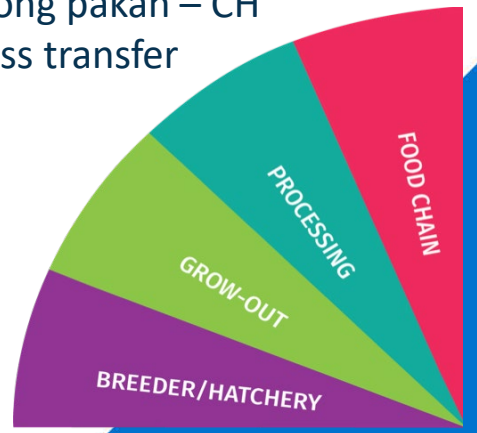
Kontrol vector di farm

Heat treatment
OA, Bacteriocins, Mineral, Acidifier

Vaksinasi : SE, SE&ST

Kosong pakan – CH
Stress transfer

- ✓ Antibiotik
- ✓ Phage terapi
- ✓ CE : Probiotics, Prebiotics



Salmonella Enteritidis di PS Broiler

Animal Type								
Broiler								
Breeder								
	O.D.	Breed 1	C Age	Mean	S/P	Titer	Group	Result
Neg	0.046							
Neg	0.045							
Pos	0.252							
Pos	0.293							
1	0.052		50-0	0.052	0.029	14	0	Neg
2	0.049		50-0	0.049	0.015	6	0	Neg
3	0.090		50-0	0.090	0.196	256	0	Neg
4	0.046		50-0	0.046	0.002	0	0	Neg
5	0.051		50-0	0.051	0.024	11	0	Neg
6	0.048		50-0	0.048	0.011	3	0	Neg
7	0.073		50-0	0.073	0.121	124	0	Neg
8	0.053		50-0	0.053	0.033	18	0	Neg
9	0.054		50-0	0.054	0.037	21	0	Neg
10	0.058		50-0	0.058	0.055	38	0	Neg
11	0.077		50-0	0.077	0.139	153	0	Neg
12	0.050		50-0	0.050	0.020	8	0	Neg
13	0.082		50-0	0.082	0.161	190	0	Neg
14	1.057		50-0	1.057	4.456	27759	16	Pos
15	0.068		50-0	0.068	0.099	92	0	Neg
16	0.048		50-0	0.048	0.011	3	0	Neg
17	0.066		50-0	0.066	0.090	80	0	Neg
18	0.077		50-0	0.077	0.139	153	0	Neg
19	0.426		50-0	0.426	1.676	6405	7	Pos
20	0.048		50-0	0.048	0.011	3	0	Neg

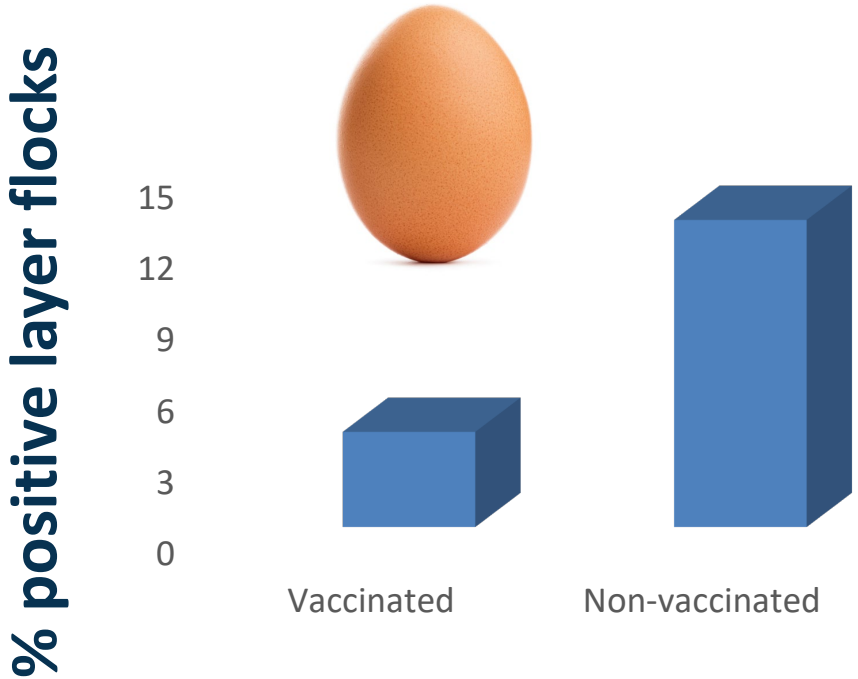
- 20 % sampel aktif Antibodi
- Vertikal transmissi ke FS
- Risk di broiler ?

Pullet Layer

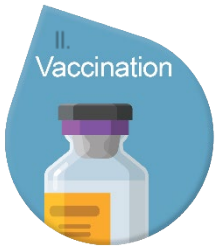
Bleed Date	Animal Type							
18-Aug-20	Commercial Layer							
	O.D.	Breed 1	C Age	Mean	S/P	Titer	Group	Result
Neg	0.047							
Neg	0.045							
Pos	0.279							
Pos	0.279							
1	0.047		10-0	0.047	0.004	1	0	Neg
2	0.047		10-0	0.047	0.004	1	0	Neg
3	0.047		10-0	0.047	0.004	1	0	Neg
4	0.048		10-0	0.048	0.009	2	0	Neg
5	0.116		10-0	0.116	0.300	486	1	Pos
6	0.052		10-0	0.052	0.026	12	0	Neg
7	0.048		10-0	0.048	0.009	2	0	Neg
8	0.055		10-0	0.055	0.039	22	0	Neg
9	0.049		10-0	0.049	0.013	4	0	Neg
10	0.050		10-0	0.050	0.017	7	0	Neg
11	0.046		10-0	0.046	0.000	0	0	Neg
12	0.046		10-0	0.046	0.000	0	0	Neg
13	0.052		10-0	0.052	0.026	12	0	Neg
14	0.048		10-0	0.048	0.009	2	0	Neg
15	0.053		10-0	0.053	0.030	15	0	Neg
16	0.053		10-0	0.053	0.030	15	0	Neg
17	0.053		10-0	0.053	0.030	15	0	Neg
18	0.056		10-0	0.056	0.043	26	0	Neg

Vaksinasi di Ayam Petelur dan insidensi *Enteritidis/Typhimurium*

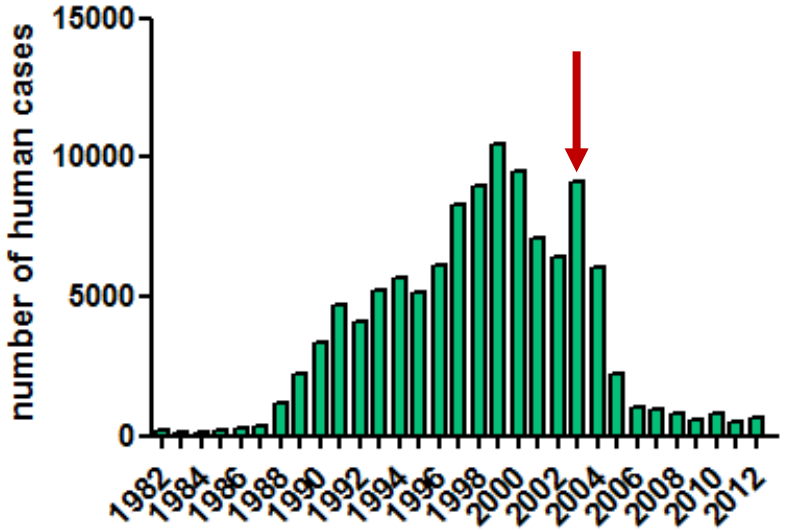
- Expectations and misconceptions
  - Flock still positive = vaccine did not work?



EFSA data 2005, 2212 farms



Obligatory vaccination layers

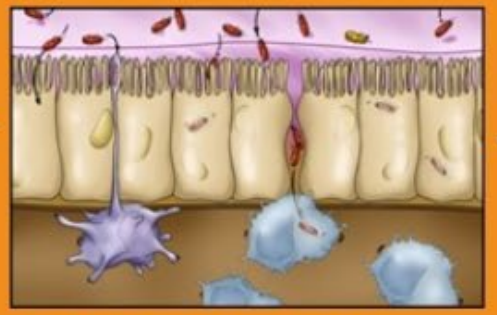


Human *Salmonella* prevalence (Belgium)

Immune response to a natural infection

Disease State

The *Salmonella* bacteria travels to the intestinal tract, where they penetrate the epithelial wall [6]

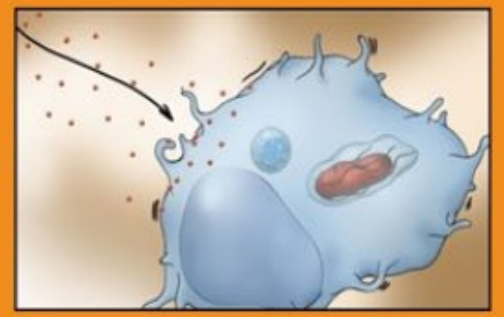


The innate immune system responds by triggering local macrophages and dendritic cells, which engulf the bacteria [6]

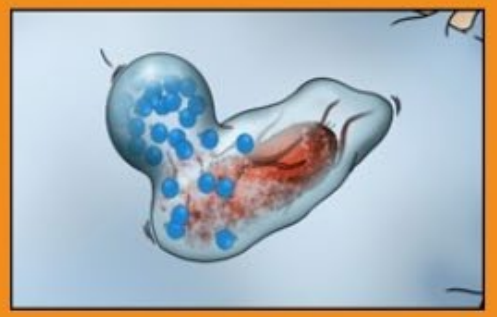
Bacterial antigens are processed and transported to the surface of the dendritic cell and B cells, and subsequent antibody response -not enough to clear infection [7]

This interaction prompts the T helper cell to release various messenger signals, which in turn ....

Bakteri Intracelluler !!!



..command the macrophage..



..to eliminate the internalized bacteria. Cell mediated response is more important than the humoral response in tackling intracellular Salmonella – however, some bactarie may evade elimination. [8]

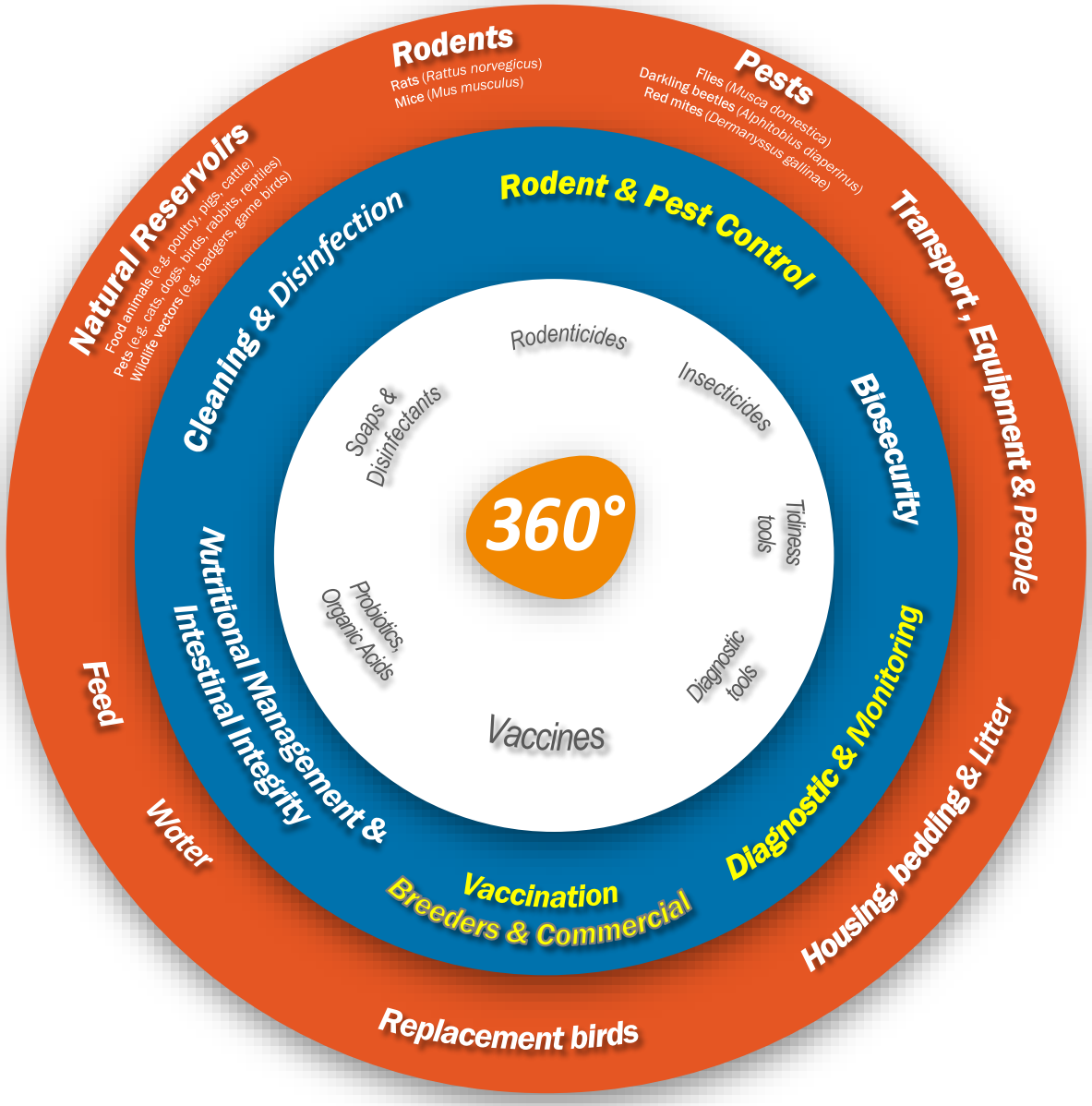
Chickens can become life-long carriers leading to contaminated meat and eggs. Less invasive serovars such as S. Infantis and S. Montevideo colonize the gut better and are excreted in the faeces for longer than highly invasive serovars such as S. Typhimurium and S. Enteritidis [6]

Holistic

Sustainable *Salmonella* prevention through an integrated approach that addresses potential sources of infection.

General Interventions:
(biosecurity, rodent & pest control, cleaning & disinfection).
To reduce the infection pressure and prevent Salmonella from entering the farm.

Specific Interventions:
(vaccination, diagnostic & monitoring, nutritional management).
To build bird immunity and prevent dissemination to susceptible birds.



Terima kasih