

On-farm interventions in medium scale broiler farms in Indonesia to control AMR

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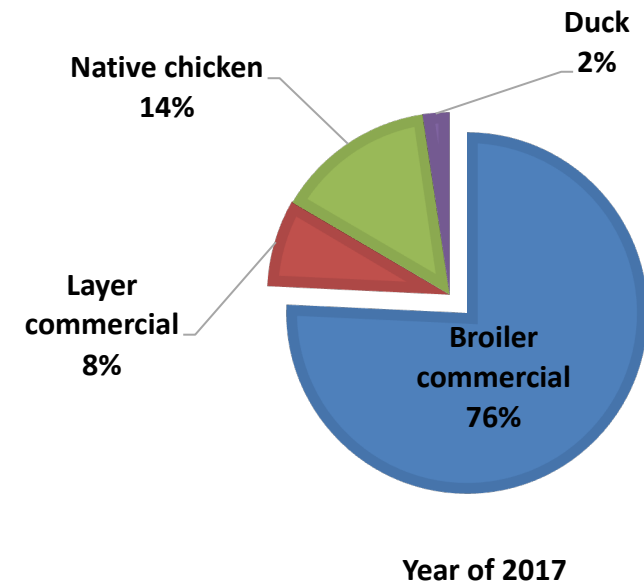
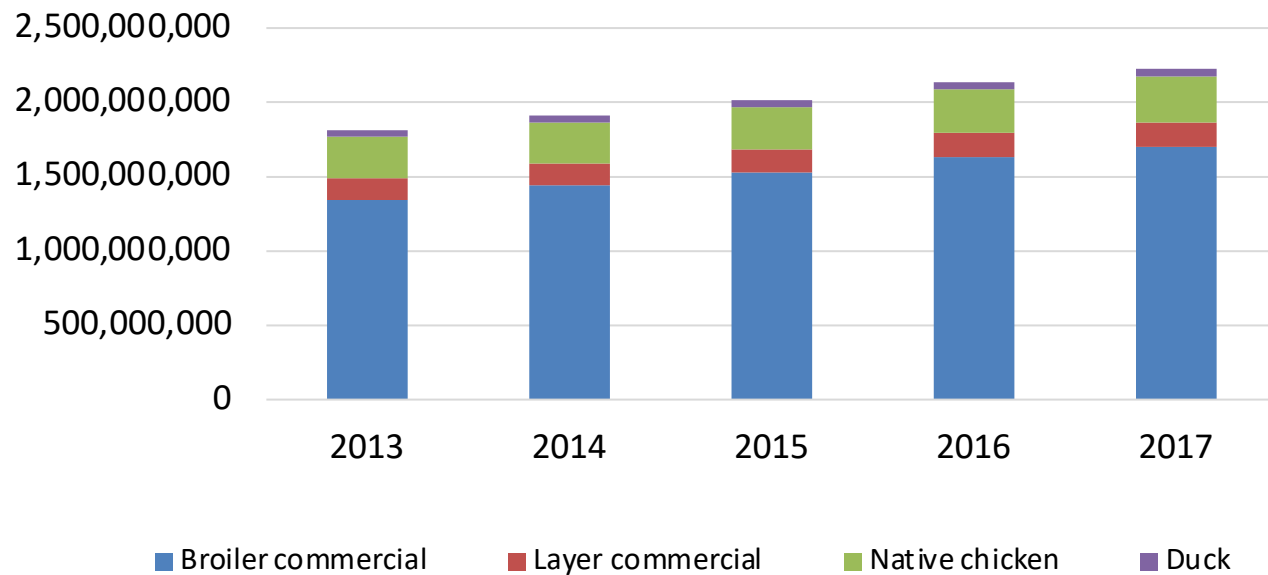


Outline (triple performance)

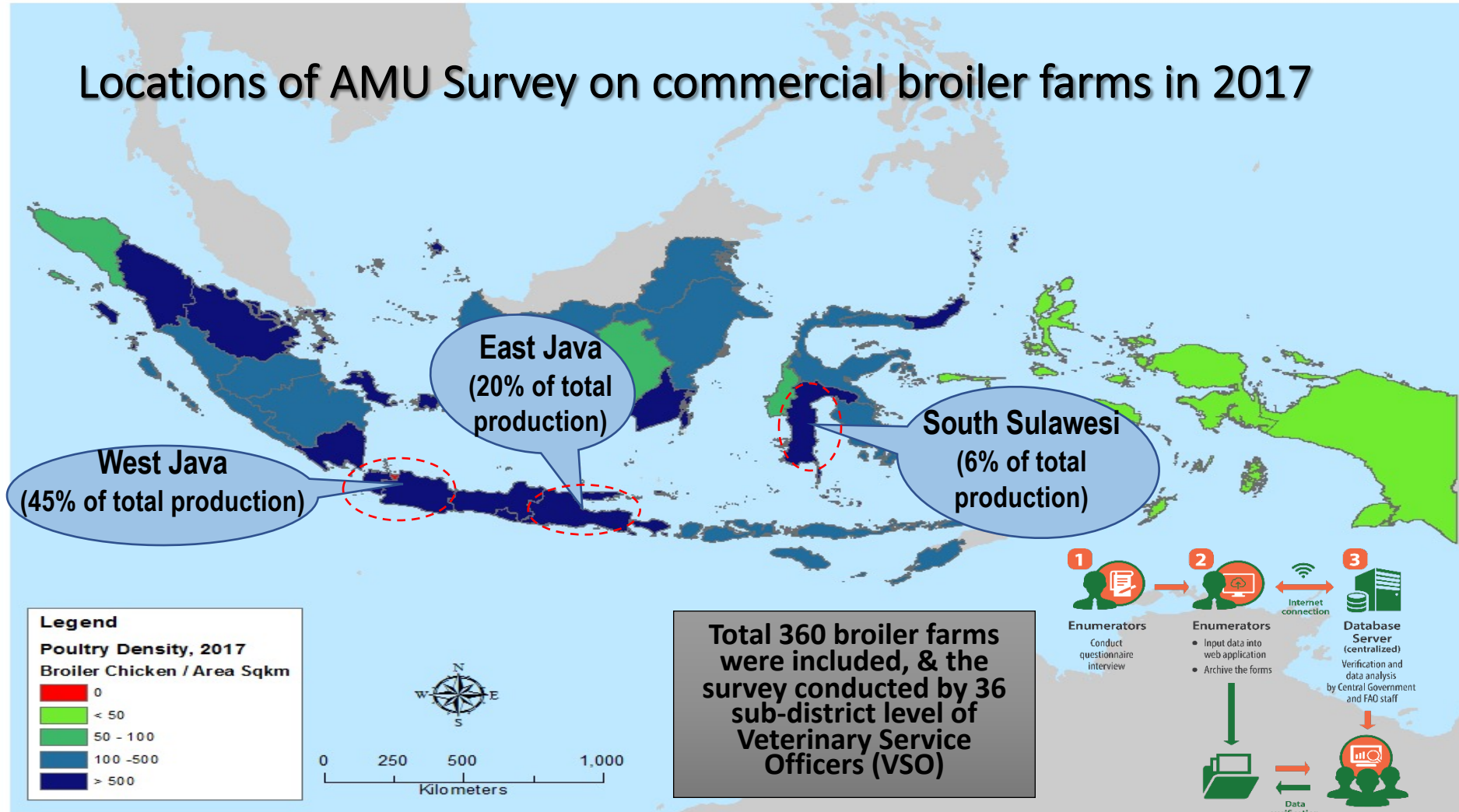
- Background - Imron
- CORNERSTONE project -Jaap
- Data reporting: Dashboards - Rianna
- Discussion - Jaap



Poultry Population in Indonesia in 2013 - 2017



Locations of AMU Survey on commercial broiler farms in 2017



ANTIBIOTICS USE ON SMALL AND MEDIUM SCALE BROILER FARMS IN WEST JAVA, EAST JAVA AND SOUTH SULAWESI PROVINCES, INDONESIA



Food and Agriculture Organization of the United Nations



USAID FROM THE AMERICAN PEOPLE

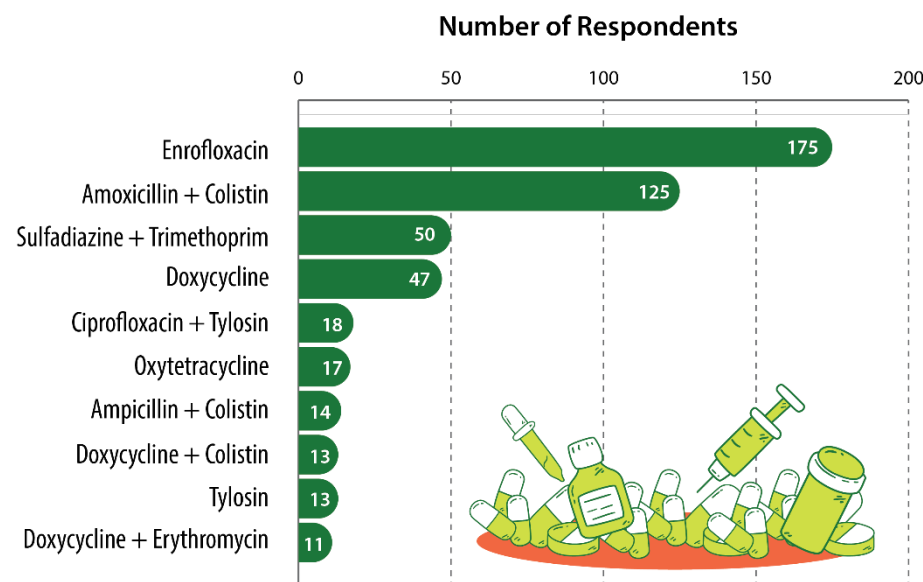


Directorate General of Livestock and Animal Health Services
Ministry of Agriculture
Republic of Indonesia

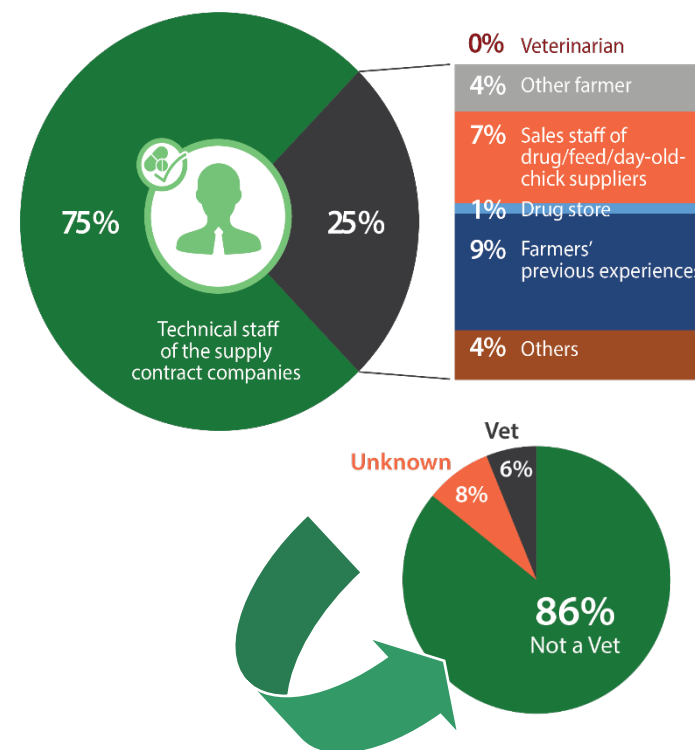
N.M.R. Isriyanthi¹, E. Setyawan², D.M. Pangaribuan¹, R. Telussa², E.R. Fitriastuti¹, G.B. Utomo², A. Kompudu², A. Harja², I. N. Agustina¹, J. Wagenaar^{3, 4}, D.C. Speksnijder³, L. Schoonman², J. McGrane².

Further information
Ni Made Ria Isriyanthi
Directorate General of Livestock and Animal Health Services,

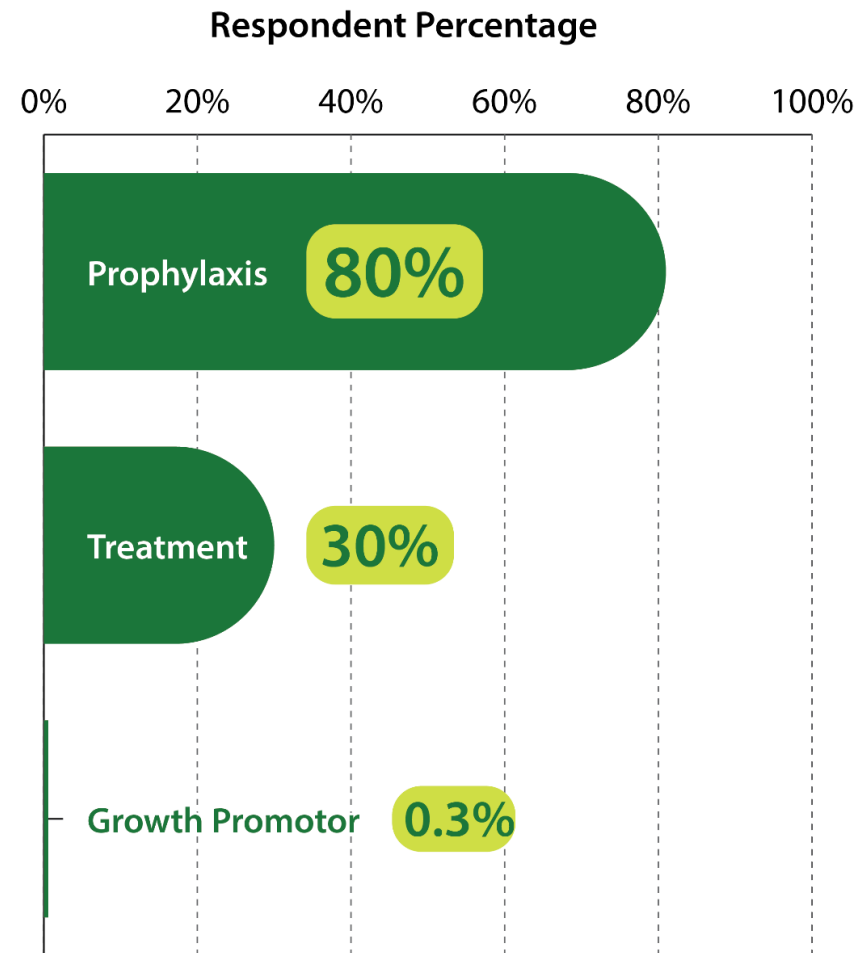
Top Ten Antibiotics (and combinations) used on 360 Surveyed Farms



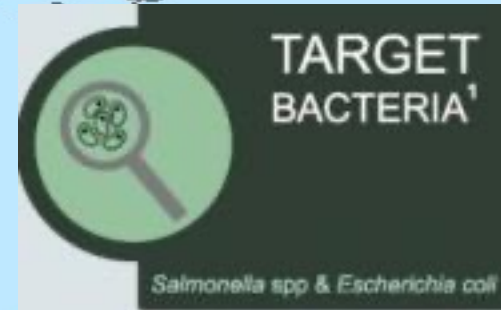
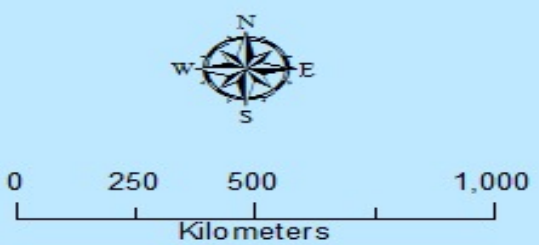
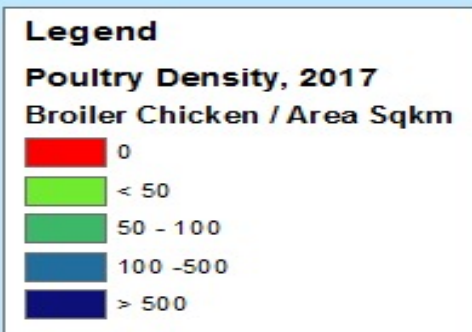
Actors that Influence Treatment Decision Making



Purpose of Antibiotic Usage on Surveyed Farms



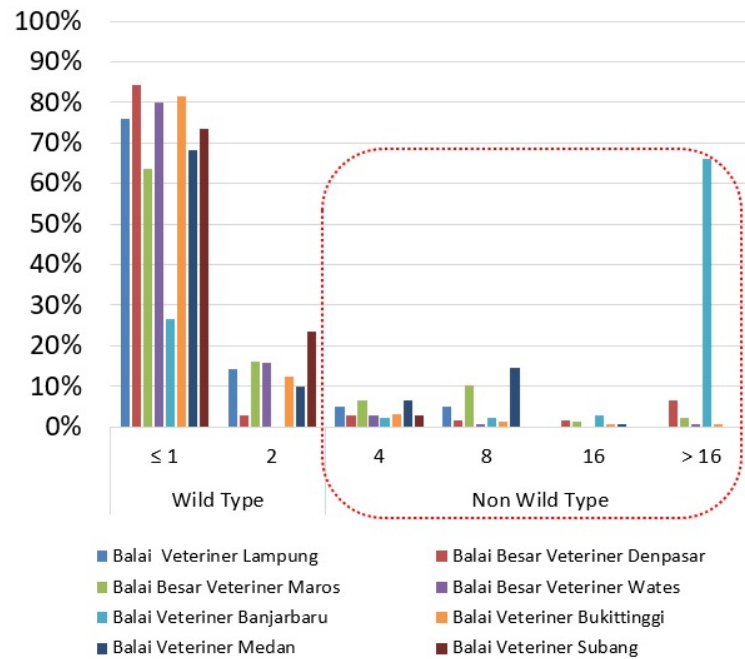
Locations of AMR monitoring on broiler commercial farms in Indonesia of 2018-2019



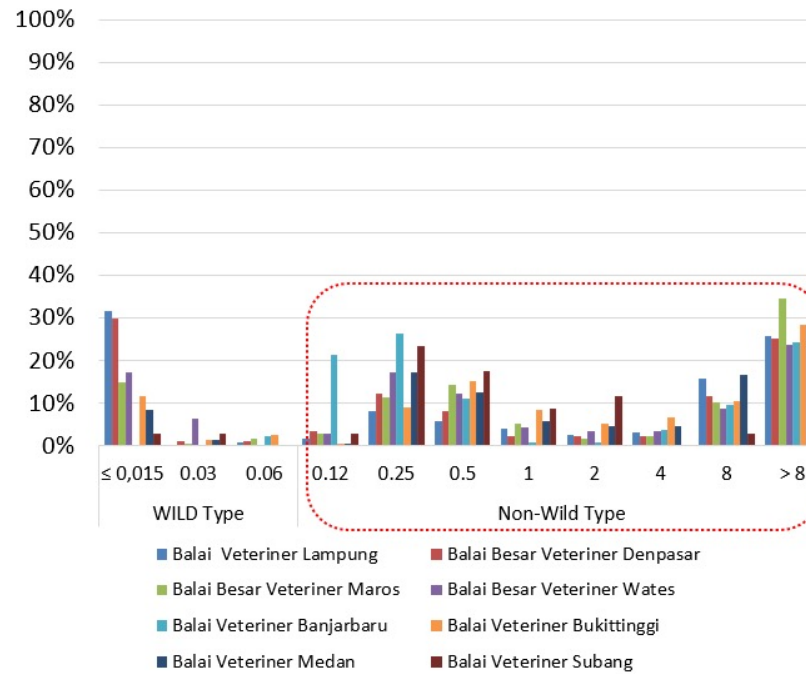
Collecting samples, identifying & isolating target bacteria

AST designated lab

Some findings of 2019 AMR monitoring on *E. coli* isolates



COLISTIN



CIPROFLOXACIN

Containment of antimicrobial resistance: towards a sustainable poultry production chain in Indonesia.

CORNERSTONE project

Aims (selected):

- To develop and test interventions in broiler production in Indonesia to reduce AMU, and to measure the effects on AMR

Research questions:

- Why, what and how much antimicrobials are used in broiler production in Indonesia?
- Is it possible to reduce AMU, and specifically highest prioritized CIAs through on-farm interventions?

Study design: 19 broiler farms

- Intensive data collection during at least 4 cycles (3 visits each cycle)
- Blood sampling (serology), trachea swabs (pathogen detection), boot-swabs for *E. coli* (AMR)
- Design a farm-specific intervention
- Implementation and follow-up for 4 production cycles
- During the project: communication with stakeholders, peer-to-peer teaching, capacity building
- Prepare Guide for Good Practice



• Background




Antimicrobials to treat diseases

- Antimicrobials (antibiotics) can kill bacteria

With antimicrobials you can treat sick animals (snot, *E. coli*, Mycoplasma)

Bacteria can become resistant to antimicrobials: antimicrobial resistance. You cannot kill these bacteria any longer



Universiteit Utrecht Oie World Health Organization WAGENINGEN

Last activity
documentation



Data collection

- Farm data
 - Farm layout
 - Management
 - Feed, water, climate (continuously), vaccination scheme
 - Production parameters
 - Farmers' mindset (KAP)
- AMU/AMR data (boot-swabs for *E. coli*)
- Animal disease data: serology (Gumboro, AI, IBV, NDV, S. Pullorum/Gallinarum), trachea swab (coryza = *Avibacterium paragallinarum*, Mycoplasma, IB, ILT, TRT)



Tanggal	UMUR	ASUMSI BW	FI (gr/ek)	Pakan	Mati	Deplesi Afkir	Total	Program Pengobatan	KETERANGAN
10	8	228	37				1625		
11	9	264	40				1623		
12	10	290	45				1621		
13	11	332	51				1620		
14	12	377	56				1620		
15	13	420	60				1620		
16	14	469	65				1620		
Total		354					1620		

Mortalitas: 1,89 %
Pakan: 25,0 KG

Berat Rata-rata: 510 GR
Rata-rata konsumsi pakan per ekor: 5,64 GR

Tanggal	UMUR	ASUMSI BW	FI (gr/ek)	Pakan	Mati	Deplesi Afkir	Total	Program Pengobatan	KETERANGAN
10	15	524	70				1620		
16	16	578	75				1620		
17	17	633	80				1620		
18	18	691	85				1620		
19	19	751	90				1620		
20	20	813	95				1620		
21	21	876	100				1620		
Total		640	595				1620		

Mortalitas: 2,86 %
Pakan: 22,80 KG

Berat Rata-rata: 2890 GR
Rata-rata konsumsi pakan per ekor: 13,18 GR

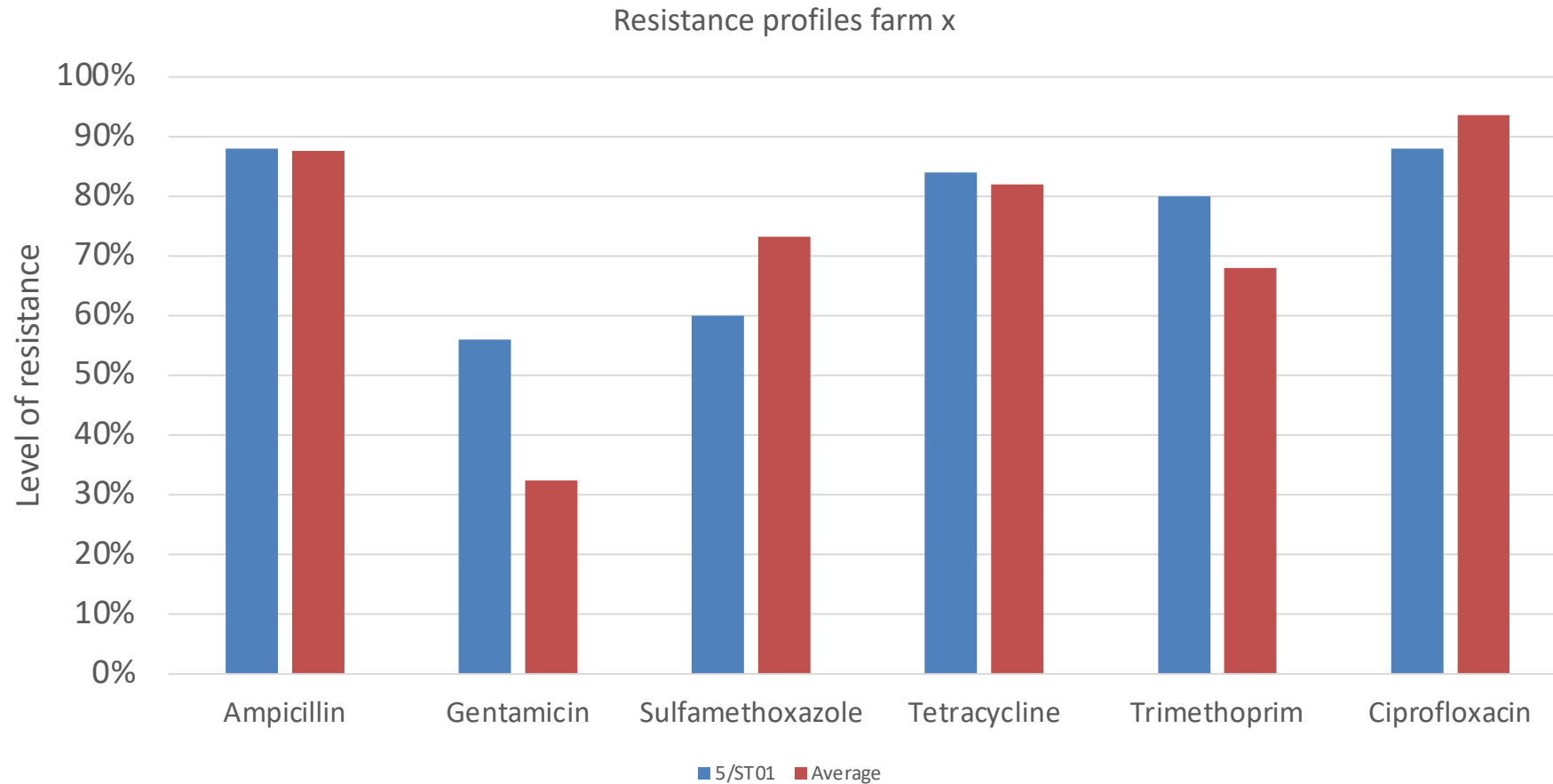


Basic principles.....

- Give farmer* background about AMU and AMR
- Provide information about the farm (e.g. animal health/production/climate)
- Bench marking

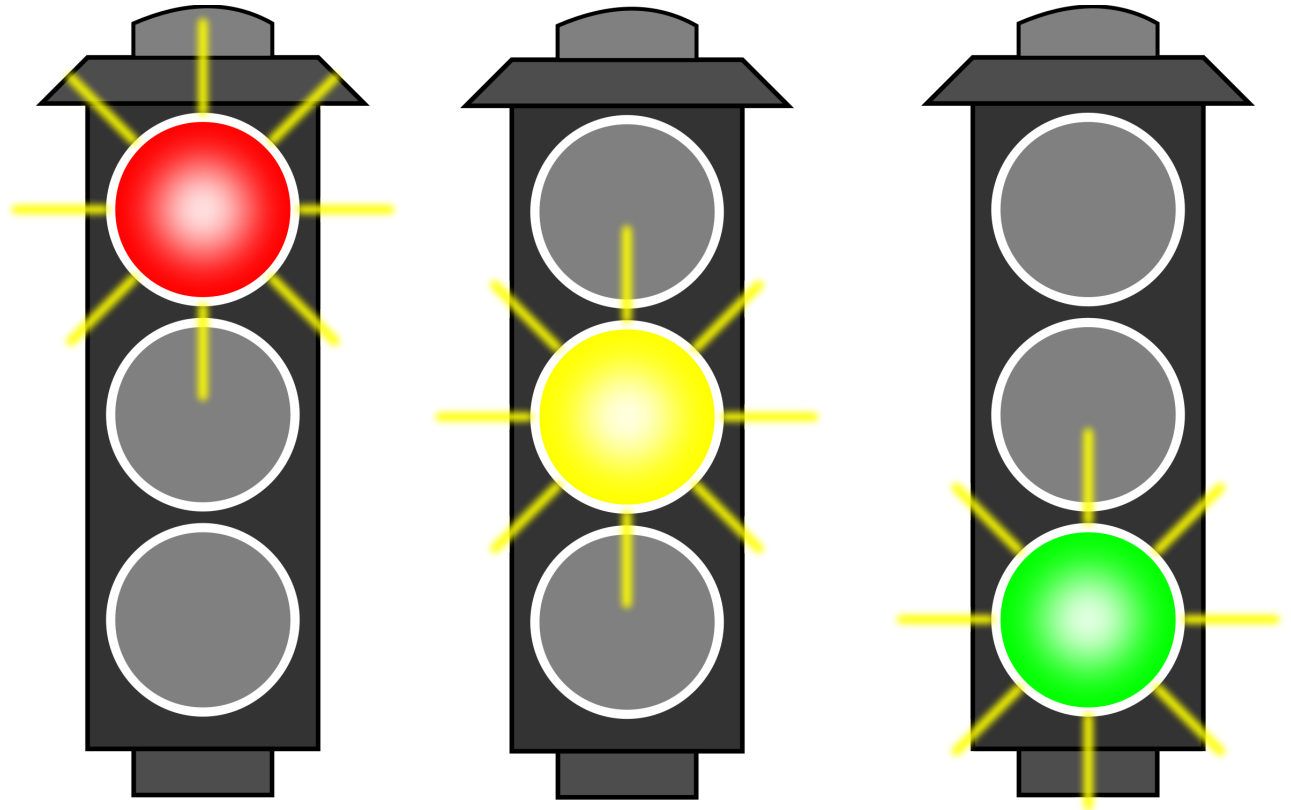
*farm owner, farm manager, farm workers.....

AMR Results (commensal *E. coli*)



Reporting of collected data to farmers

- Data collected on:
 - Critical infectious diseases,
 - Broiler performance,
 - AMU,
 - AMR,
 - Biosecurity,
 - Climate
- Use of traffic-light color coding
 - Red: action required
 - Orange: action not required but still advised
 - Green: no action needed
- Summary of practical advice
- Data report using graph's, and tables.



Overall Advice per topic (color coding according to traffic-light)

Concluding advice:

Critical Infectious Diseases

- Evaluate the vaccination programme, specifically for IBV and NDV
- There is a high mortality: Does the farmer recollect any signs of disease?
- A training on how to perform a DOC score so that the farmer himself can score his own DOCs upon arrival.

Adequate use of medicines (Mainly ANTIMICROBIALS):

- Establish the exact reason for using antimicrobial products (example: if you are using antimicrobials as a prevention for more mortality because you've seen a high mortality, the reason for use is: high mortality; if you are using antimicrobials because you are afraid for an increase in mortality, the reason is: fear for increased mortality)
- Consult a veterinarian to find out if you are using antimicrobial products correctly
- Try to avoid the use of antimicrobial products from the HPCIA category.

Biosecurity:

- External Biosecurity
 - Logg sheet (Who comes in the farm)
 - Limit access to the farm
- Employees and Equipment
 - Clean equipment after each use and between use when using the equipment in different houses.
 - Training of employees on the importance of good biosecurity
 - Hygiene protocol for all entering the farm:
 - Provide special farm clothing (sandals/overalls)
 - Wash your hands before entering
- Movements and Purchases
 - Request copies of vaccination and treatment records of all purchased birds in order to improve health management.
 - Store feed safely where no other animals can reach it

Climate: Daily monitoring of the flock for signs of heat stress

Concluding advice:

Critical Infectious Diseases

- Response to vaccination IBV and NDV seems good. There is no detectable response to the vaccination against IBV. **The vaccination program should be evaluated and, if necessary due to risk of disease, improved.**
- There was small sign of (mild) clinical infection of AI H9N2 in cycle 4 and 5

Adequate use of medicines (Mainly ANTIMICROBIALS):

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Biosecurity:

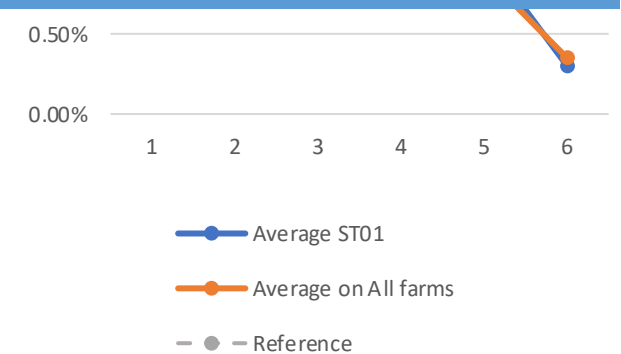
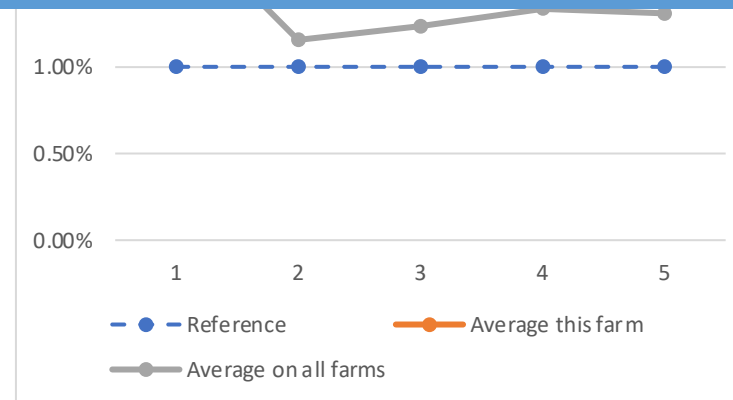
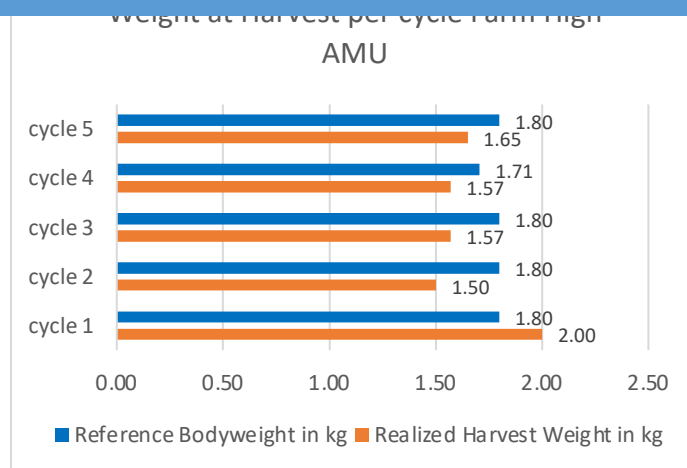
- External Biosecurity
 - Log sheet (Who enters the farm)
 - Limit access to the farm (using a gate for example)
- Employees and Equipment
 - Clean equipment after each use and between use when using the equipment in different houses.
 - Training of employees on the importance of good biosecurity
 - Hygiene protocol for all entering the farm:
 - Provide special farm clothing (sandals/overalls)
 - Wash your hands before entering
- Management of Veterinary drugs
 - Always read the label directions for proper storage of vaccines and medications
 - Monitor your supply refrigerator more often to help ensure the products are adequately stored (36-46°F/2-8°C)
 - Restrict vaccine and medicine access to only trained personnel

Climate: Daily monitoring of the flock for signs of heat stress

Broiler performance: Mortality, Harvest Weight, (FCR)

Things to NOTE:

- Farmer of high AMU recalled trouble in obtaining feed and a very hot (temperature) period, possibly explaining high mortality
- Most Farms did not obtain target weight at harvest
- Further analysis is required before we can make any conclusions regarding relations between Broiler performance and AMU



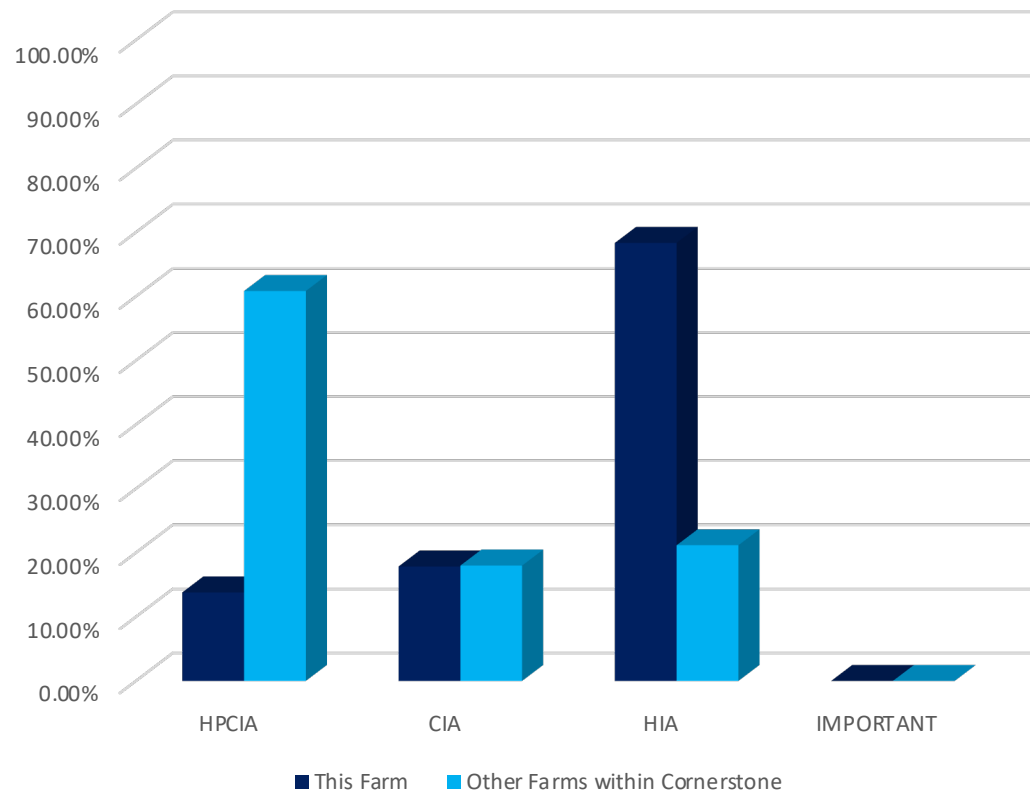
Antimicrobial use (AMU) (1/3)

	Average on this farm	Average on all farms
TOTAL TF _{UDDindo}	10	9.98
- % HPCIA Moxacol, Lincospect	13.81%	60.84%
- % CIA	17.86%	17.99%
- % HIA Therapy, Antikoksi	68.33%	21.17%
- % IMPORTANT	0.00%	0.00%
PURPOSE		
- Prevention	100.00%	89.39%
- Treatment	0.00%	10.61%

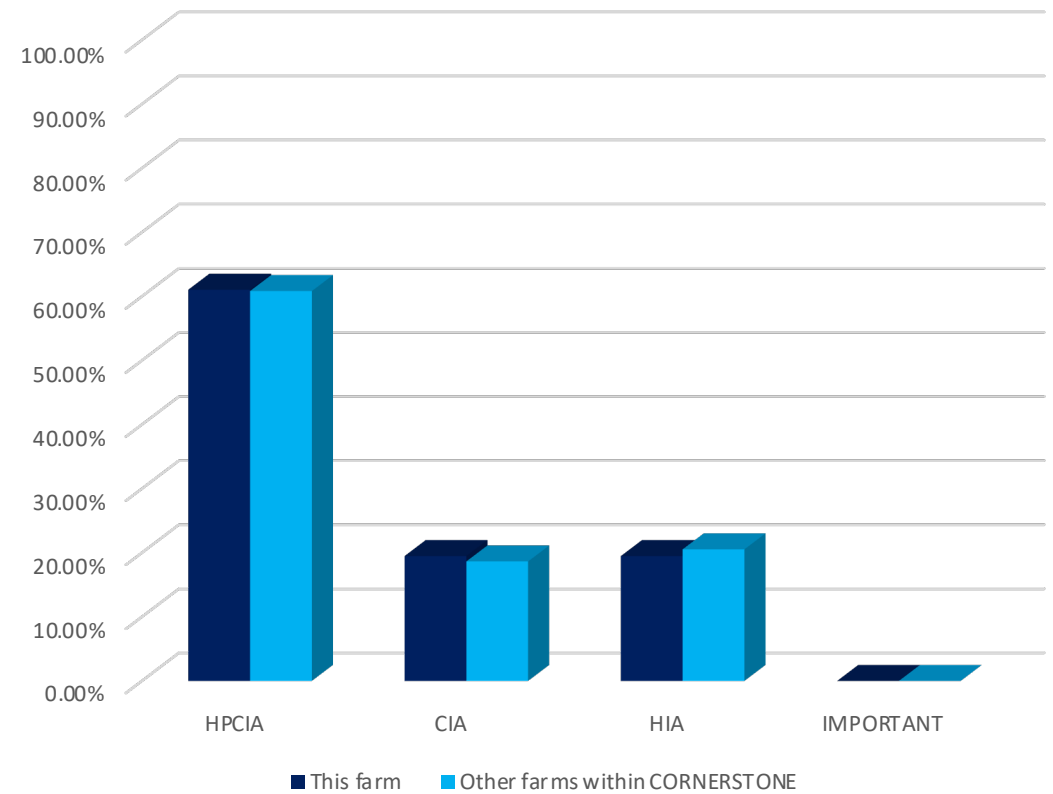
	Average on this farm	Average on all farms
TOTAL TF _{UDDindo}	16.00	9.98
- % HPCIA Moxacol, Enromas, Cipromas, Doxerin	61.04%	60.84%
- % CIA Amoxcol	19.48%	17.99%
- % HIA Doxerin	19.48%	21.17%
- % IMPORTANT	0.00%	0.00%
PURPOSE		
- Prevention	100.00%	93.33%
- Treatment	0.00%	6.67%

AMU: Distribution (2/3)

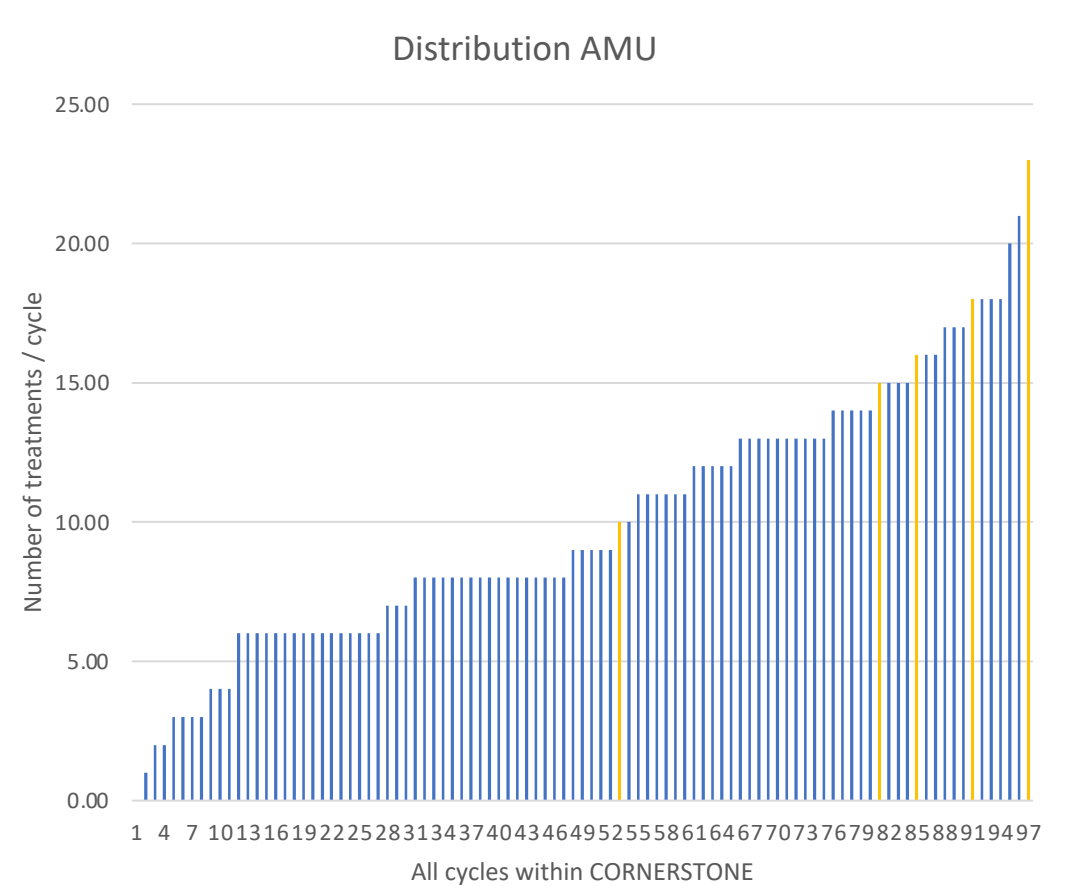
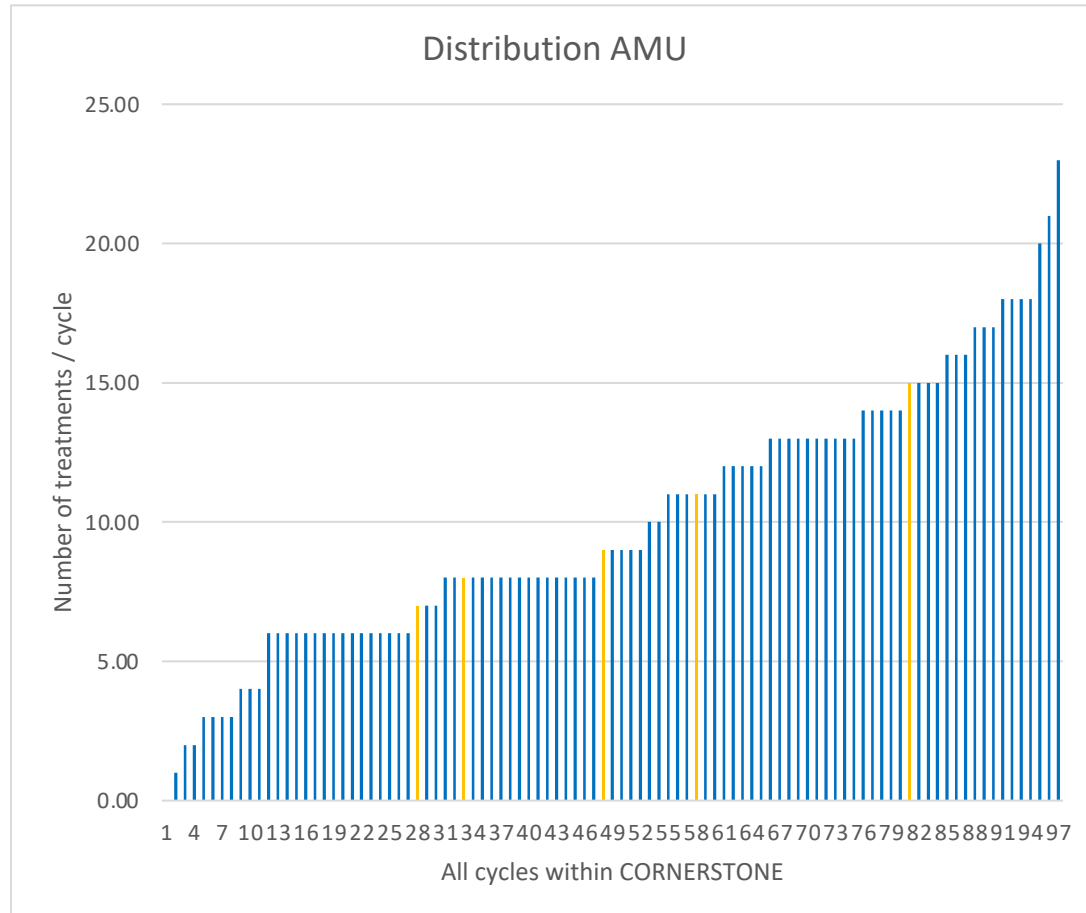
AMU per class in % of given treatments



AMU per class in % of given treatments



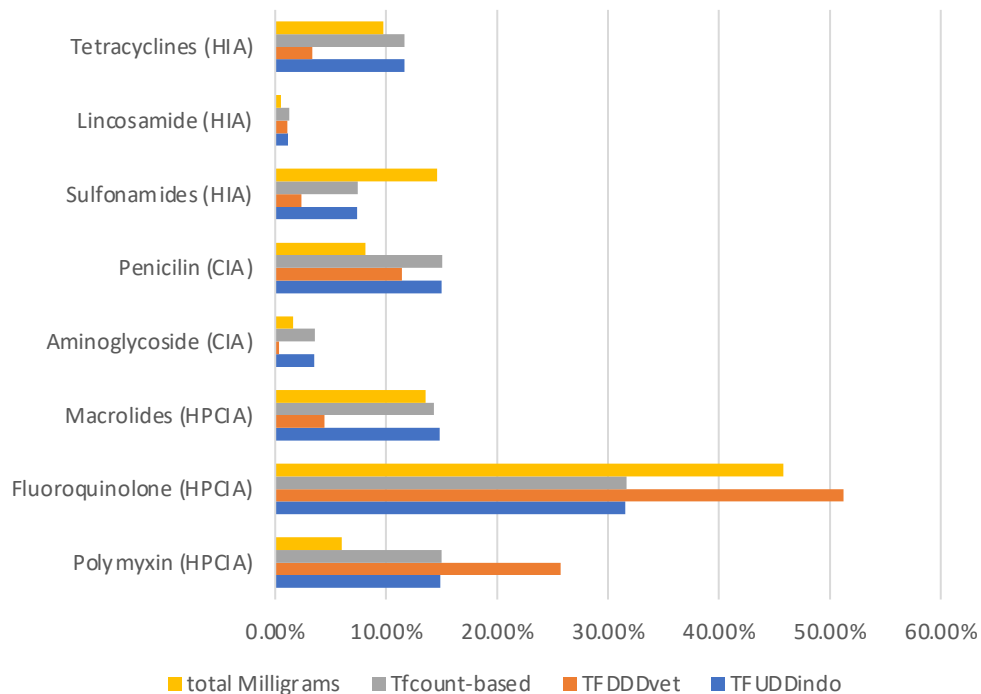
AMU: Benchmark according to number of treatments/cycle (3/3)



Issue AMU: Ranking of the farms depends on the indicator

- Dose based (days/production cycle)
- Mass based (mg/kg)
- Count based (n treatments/time period)

% of different classes antimicrobials used



Antibiotic product	UDDindo	DDDvet
Colistin (Polymyxin (HPCIA))	16,3	5,1
Flumequin (Fluoroquinolone (HPCIA))	5,1	14,0
Enrofloxacin (Fluoroquinolone (HPCIA))	34,5	10,0
Erythromycin (Macrolides (HPCIA))	18,9	20,0
Spiramycin (Macrolides (HPCIA))	8,3	73,0
Tylosin (Macrolides (HPCIA))	35,4	81,0
Cyprofloxacin (Aminoglycoside (CIA))	41,0	NOT DEFINED
Neomycin (Aminoglycoside (CIA))	5,6	24,0
Amoxicilin (Penicilin (CIA))	21,6	16,0
Fosfomicin (Fosfomicin (CIA))	21,8	NOT DEFINED
Spectinomycin (Aminoglycoside (CIA))	15,2	124,0
Lincomycin (Lincosamide (HIA))	14,7	8,6
Oxytetracyclin (Tetracycline (HIA))	15,4	39,0
Doxycyclin (Tetracycline (HIA))	10,2	15,0
Sulfadiazin, Trimetoprim (Sulfonamide (HIA))	29,2	34,0
Sulfaquinoxaline Natrium, Pyrimethamin (Sulfonamide (HIA))	15,1	60,0
TMP/S (Sulfonamide (HIA))	39,5	81,0

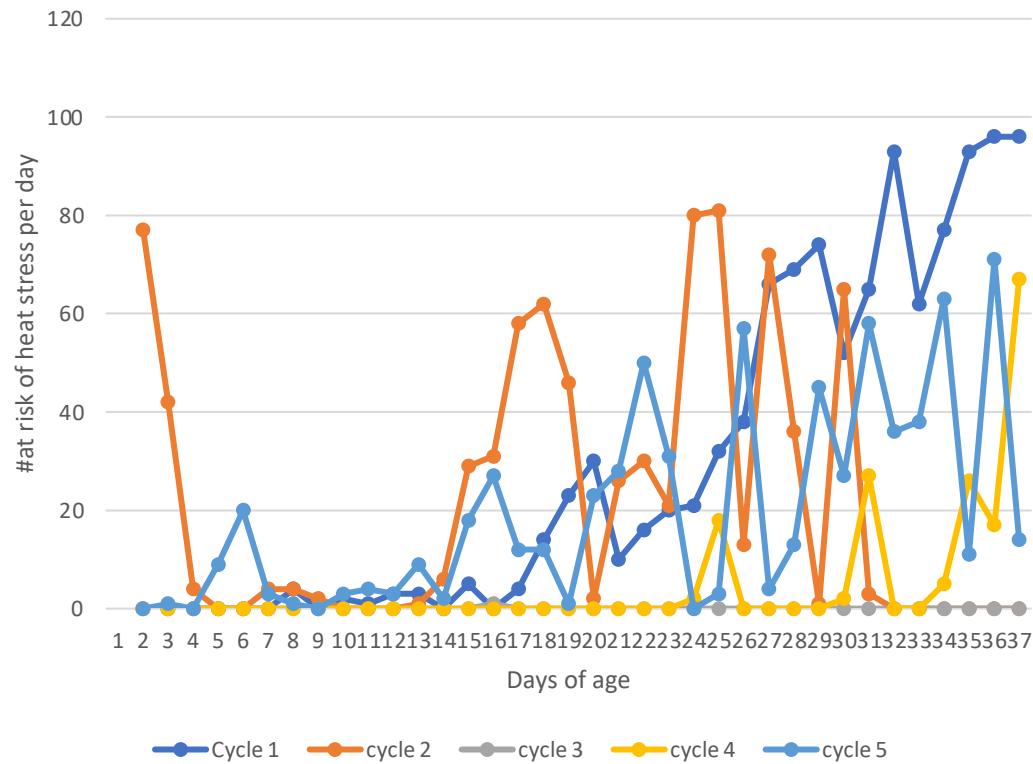
Biosecurity

Biosecurity and Disease management			
Topic	Actual score (# of management practices according to the recommendations)	Max score	Needs attention
External biosecurity	1	12	Yes
Employees & equipment	2	8	Yes
Movements & purchases	3	7	Yes
Feed and water management	10	14	No
Internal biosecurity & disease management	15	26	Possibly
Management of veterinary drugs	6	6	No

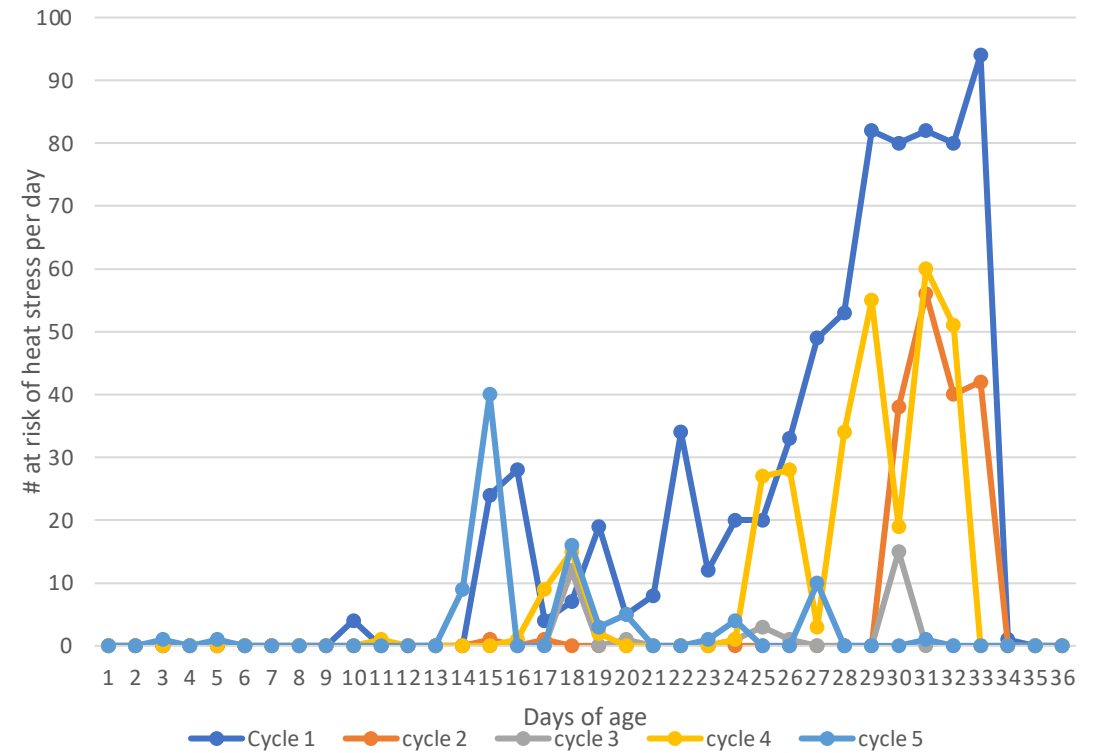
Biosecurity and Disease management			
Topic	Actual score (# of management practices according to the recommendations)	Max score	Needs attention
External biosecurity	4	12	Yes
Employees & equipment	2	8	Yes
Movements & purchases	4	7	Possibly
Feed and water management	8	14	Possibly
Internal biosecurity & disease management	11	26	Possibly
Management of veterinary drugs	1	6	Yes

Climate

Number of times at severe risk of Heat Stress per day per cycle (Temperature + Humidity > 110)



Number of times at severe risk of Heat stress per day per cycle (Temperature + Humidity > 110)



Current status: start of interventions

- Inform the farmer about farm results (including bench marking)
- Training:
 - Biosecurity
 - DOC (Day Old Chicken) scoring
- Use of Formulary (indications and shift towards 'lower class')
- Peer-to-Peer sessions

Conclusion on current status CORNERSTONE

- How to translate policy into practice.....
 - Data is difficult to obtain (data quality!)
 - Due to external influences farms can be empty for longer periods of time
 - Extensive supervision is required to collect good-quality data and to keep farmer involved. A sample size bigger than the one we have (19 farms) is almost impossible to manage



Sunandar, Albertus Teguh Muljono, Nofita Nurbiyanti, Kodrat Zulfikar Bandoro, Tri Setyo Purwanto, M Aulia Bagaskara, Sri Handayani, Annisa Devi and Rannga Putra



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Rianna Anwar Sani, Tagrid Dinar, David Speksnijder, Sjaak de Wit and Jaap Wagenaar

Ministry of Agriculture (DGLAHS) - *Imron Suandy, Liys Desmayanti, Ibu Ria*

FAO - *Patricia Noreva, Riana A. Arief, Erianto Nugroho, Luuk Schoonman*

BPMSPH - *Kanti Puji Rahayu, Oli Susanti, Ery Novarieta Harshanti, Nuraini Triwijayanti Supar*

DIC Subang – *Puttik Allamanda*

ASOHI - *Irawati Fari, Andi Wijanarko*

Advance Consulting – *Frank Joosten*

**Financially supported by: NWO/WOTRO
(Cooperation Indonesia-The
Netherlands) and NWO-Hestia**

Discussion (1/4): **your input requested!!**

- How do we motivate farmers to change their practice? (carrot)
- What is the problem for the farmer?
- What makes a farmer to decide to change a running system?
 - Risk for increased mortality
 - Antimicrobials are very cheap
 - Hardly/no data on economic aspects of AMR (treatment failure)
 - How to get away from preventive use?
 - Antimicrobials over the counter.....
- Responsibility for human health? (sampling farmers) – is this a true story?

Discussion (2/4): implementation....

- Support animal health by improved diagnostics
 - Is this logistically possible?
 - Is this financially possible?
 - Does farmer see value? (susceptibility testing always too late...)
- Support by veterinary oversight (=> prudent use of antimicrobials)
 - Experienced poultry vets/paravets needed, costs?
- Chain approach: in CORNERSTONE broiler-farmers have no influence on hatcheries.

Discussion (3/4) Drivers for farmer....

- Economics
- Can we define a business case?
 - Niche market?
 - Export ambition?
- Improved animal health (*sec* as driver?)
- Suggestions for other drivers?
- Changes only possible with considerable changes in management (e.g. closed housing)?

Policy measure taken by MoA



PERATURAN MENTERI PERTANIAN REPUBLIK INDONESIA

NOMOR 14/PERMENTAN/PK.350/5/2017

TENTANG

KLASIFIKASI OBAT HEWAN

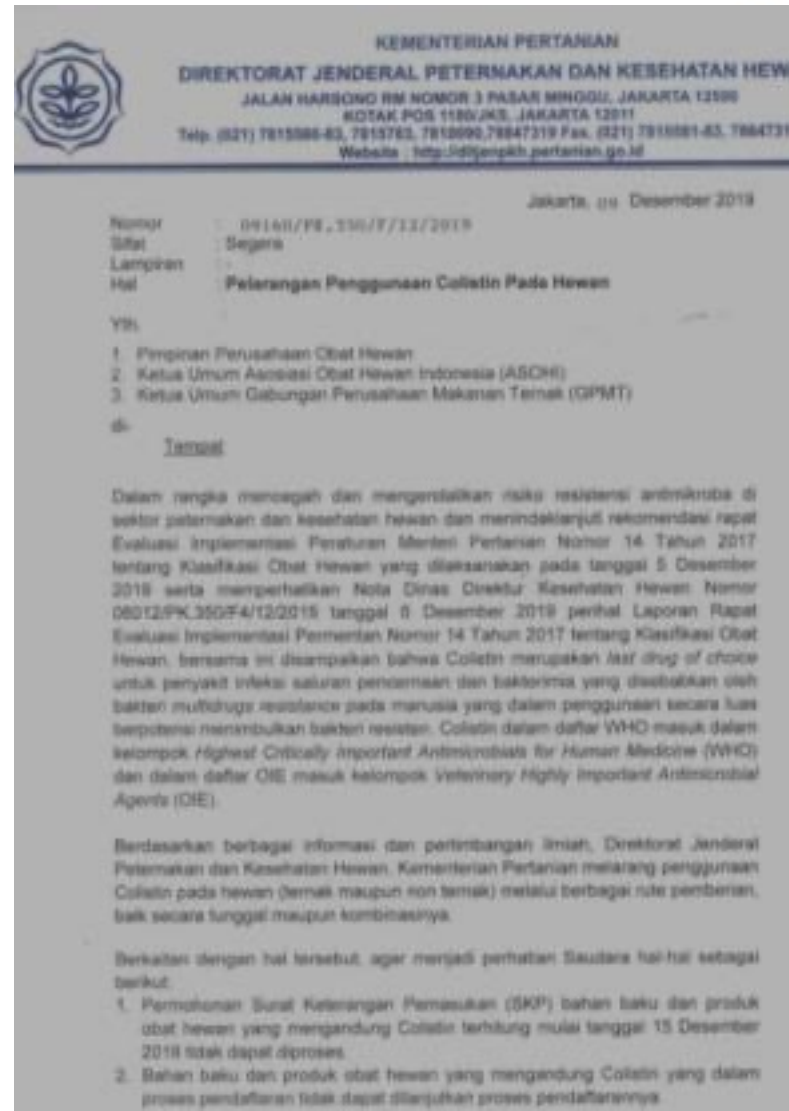
DENGAN RAHMAT TUHAN YANG MAHA ESA

MENTERI PERTANIAN REPUBLIK INDONESIA,

**Banned AGP
regulation by
Ministrial Decree
(2017)**



**Banned Colistin for
animal use (2019)**



3. Batas akhir peredaran dan penggunaan bahan baku dan produk obat hewan yang mengandung Colistin sampai 30 Juni 2020;
4. Produk obat hewan yang mengandung Colistin baik tunggal maupun kombinasi dan telah memiliki nomor pendaftaran obat hewan sejak tanggal 1 Juli 2020 dicabut nomor pendaftarannya.

Demikian disampaikan, atas perhatian dan kerjasamanya diucapkan terima kasih.



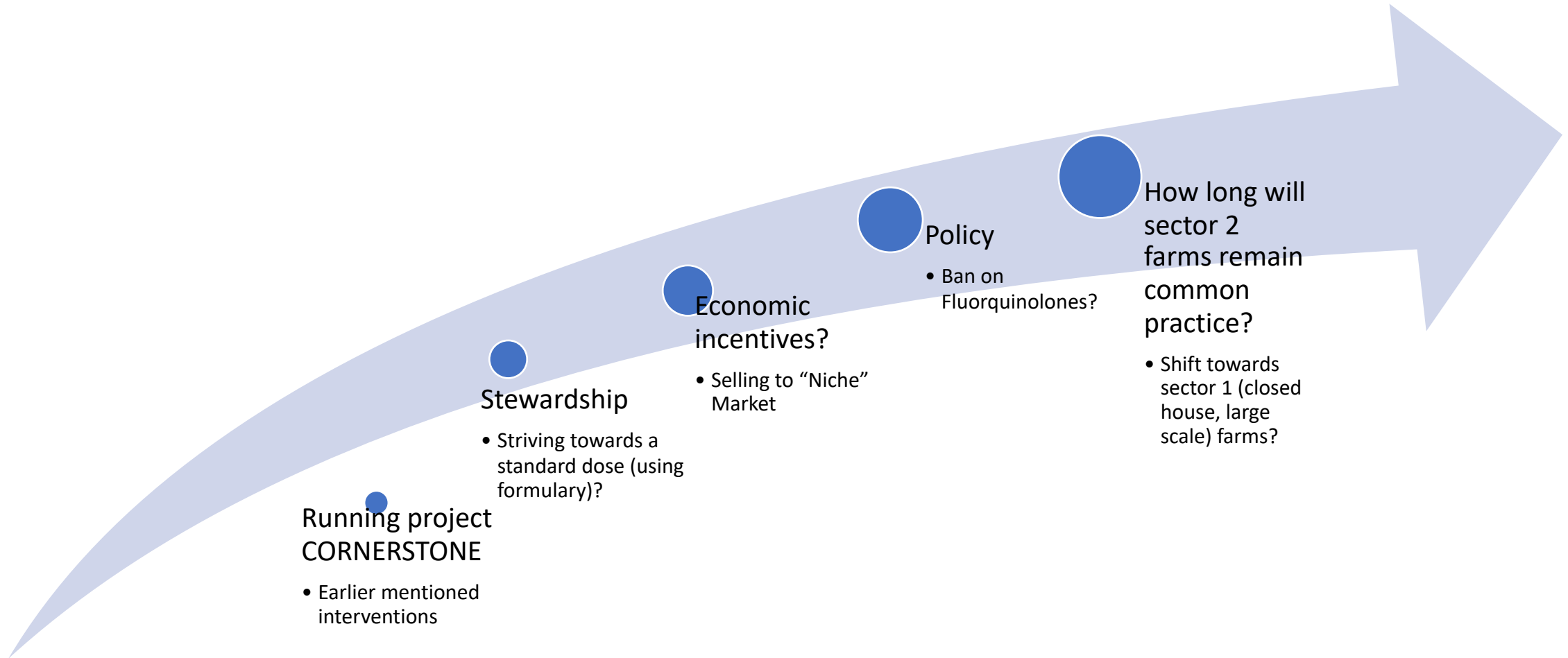
Tembusan Yth.

1. Direktur Kesehatan Hewan;
2. Direktur Kesehatan Masyarakat Veteriner;
3. Direktur Pakan;
4. Kepala Balai Besar Pengujian Mutu dan Sertifikasi Obat Hewan;
5. Kepala Dinas Yang Membidangi Fungsi Peternakan dan Kesehatan Hewan Provinsi Seluruh Indonesia;
6. Kepala Dinas Yang Membidangi Fungsi Peternakan dan Kesehatan Hewan Kabupaten/Kota Seluruh Indonesia;
7. Arsip.

Discussion (4/4): Policy measures in Indonesia

- Ban on growth promoters (2017)
- Ban on colistin (2019)
- Ban on fluoroquinolones? (WAIVER: JUST AS OPTION – FREE THINKING OF PRESENTERS).
- Availability of antimicrobials
- Other sticks?

What next?



Thanks to.....

*CORNERSTONE: Sunandar, Albertus Teguh Muljono, Nofita Nurbiyanti, Kodrat Zulfikar Bandoro, Tri Setyo Purwanto, M Aulia Bagaskara, Sri Handayani, Annisa Devi and Rannga Putra
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Fleming Fund Fellow program: Imron Suandy, Dinarti Kardono, Liys Desmayanti, Nunu Triwijayanti, Titiiek Sulistyowati, Tri Pudy Asmarawati, Nuryani Zainuddin, Dr. Nelly, Dwi Febriyana, Tati Febrianti, Juliëtte Severin, Carolien Ruesen, Heiman Werdheim, Annelise Pires Ferreira.

FAO: Alejandro, Jeff, Francesca, Rodolphe, Joy, Jorge, Katinka, FAO-CJWZ, FAO-NSAH, FAO-NSL, FAO-NFI, and FAO-ESF, WHO, OIE, UNEP

Hubert Endtz, Heike Schmitt, Kees Veldman, Dik Mevius, David Speksnijder, and many others!

Thanks to you for listening and providing input to shape our ideas for the future!!