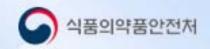
Antimicrobial resistance II: Situation and strategies in Korea

Food Microbiology division, NIFDS, MFDS

Soohwan Suh





Contents

- I. Status of antimicrobial-resistance management in South Korea
 - 1. History of the national AMR management program
 - 2. Major outcomes of national AMR programs
 - 3. Future directions
- II. Resistance rate in retail meats
 - 1. Resistance in domestic and imported meats

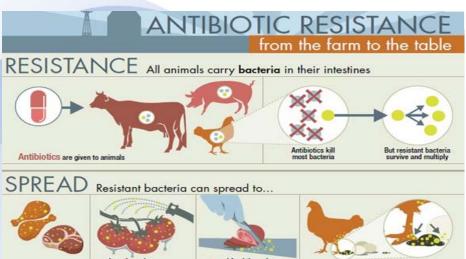
Threats of antimicrobial-resistance

the environment when animals poop

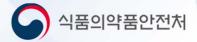






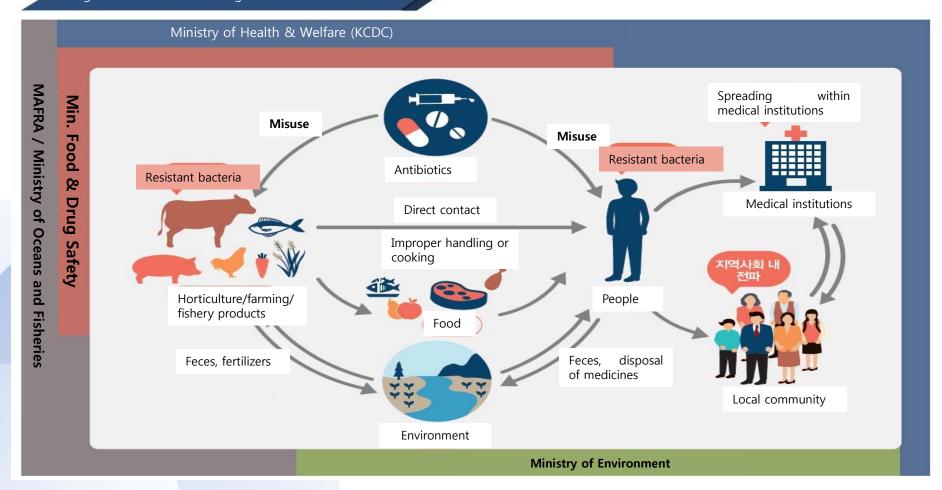






Threats of antimicrobial-resistance

Origins and channels of contaigion







National Antimicrobial-resistance Management Program (2003-2007)

NVRQS (Ministry of agriculture)

 Monitoring of antimicrobial resistance on the food-animals and meats

Asia Pacific Foundation for Infectuous Disease (Samsung Medical Center)

 Control of antimicrobial resistance in hospitals through integrated antimicrobial stewardship program

NFRDI Ministry of marine affairs and fisheries

 Monitoring of antimicrobial resistance for aquaculture and introduction of organic marine production system

Seoul National University / Korea University

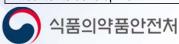
- Risk analysis of critically important veterinary antimicrobials
- Risk analysis of antimicrobial resistant bacteria

Korea consumer agency

- Antibiotic resistance monitoring for animal farm environment and impact assessment
- Surveillance of antimicrobial resistant bacteria from animal farm environment

Korea consumer affairs institute / Yonsei University

- °Survey for awareness of antimicrobial resistance
- Evaluation of the effect of public relation and contents development



Korea Food and Drug Administration

- •General management & budget allocation
- Development of network for integrated antimicrobial resistance management
- Construction of information share portal
- Management of expert committee for antimicrobial resistance
- Public relation and education
- Invitation of Codex AMR TF
- Research for foodborne antimicrobial resistant bacteria

Drug resistance Division (KCDC)

 Surveillance of antimicrobial resistant pathogens in community

Enterobacteria Division(KCDC) 8 Regional Research institute of public health and environment

Establishment for national FoodNet for antimcirobial resistance

Yonsei University (21 University hospital)

 Devising strategies to reduce antibiotic resistance in clinical medicine



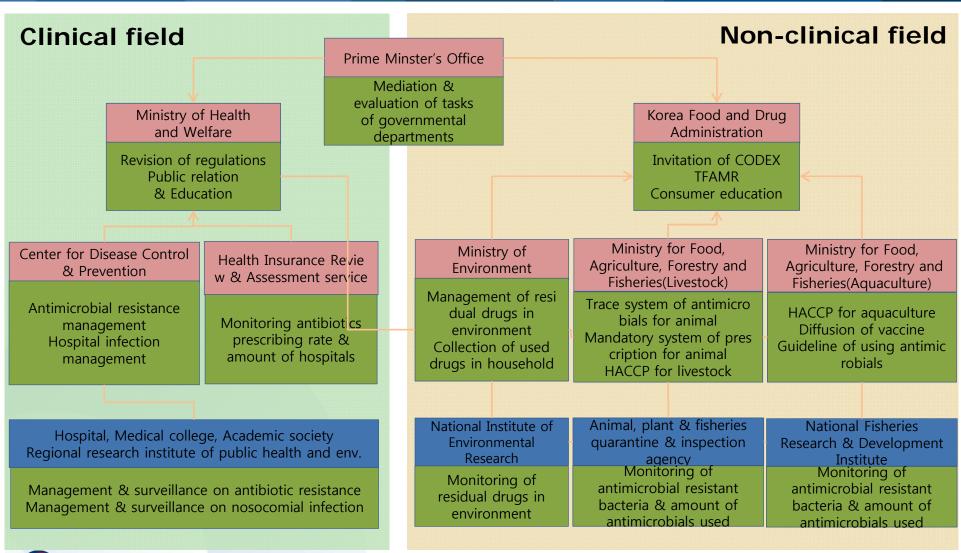
Yonsei University / Culture collection of anti microbial resistant microbes

 Construction of Culture collection of antimicrobial resistant microbes

Kosin University

Analysis of antimicrobial resistance gene

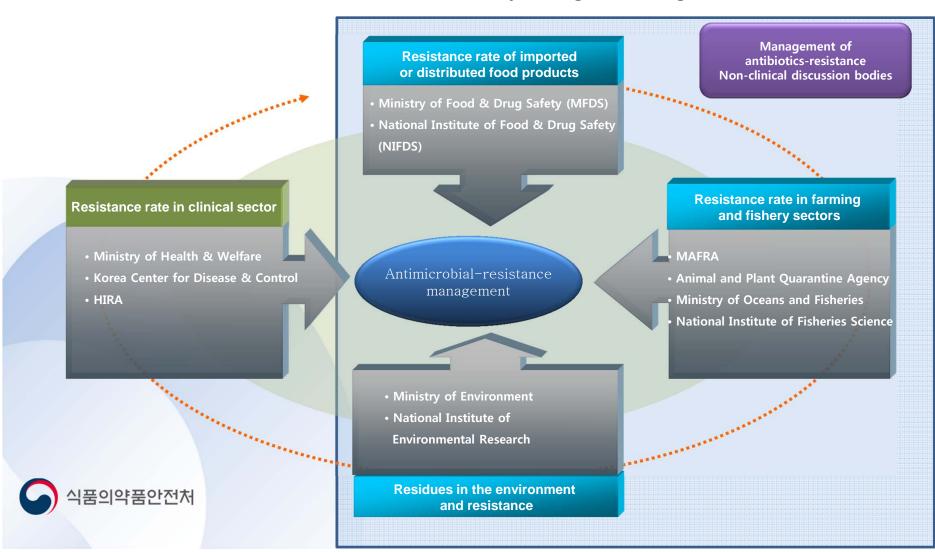
National Antimicrobial-resistance Management Program (2008-2012)





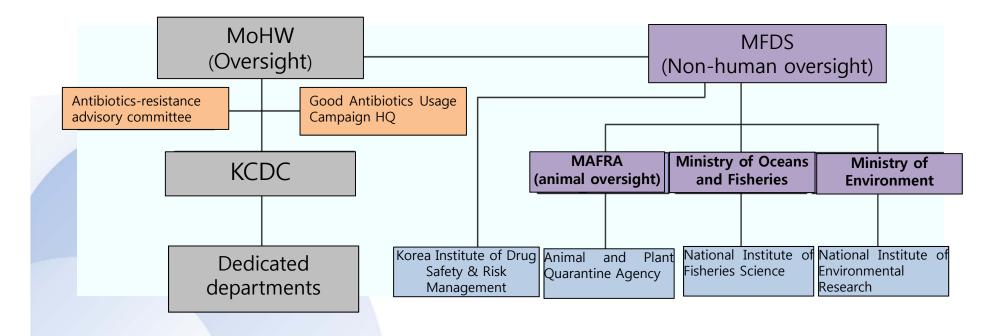
Non-clinical discussion bodies (2013~2016)

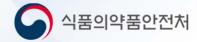
Monitoring of antimicrobial-resistance in each sector
 after the end of "National Antibiotics-resistance Safety Management Program"



National action plan of Korea (2016~)

- WHO presented a global action plan and urged national-level actions (2015).
- Developed and implemented the National Action Plan on AMR





One health approach fight AMR (2017~)



Surveillance of **Antimicrobial** drug usage

approach to AMR surveillance Interaction and translocation of among Humananimalenvironment

on Multi-Control resistance and treatment

One health

Ministry of **Environment** Ministry of Health & Welfare

Ministry of Science & ICT

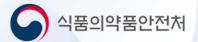
Ministry of Oceans & **Fisheries**

Research

drug

Ministry of Food & Drug Safety

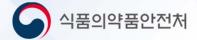
Ministry of Agriculture, Food & Rural Affiars



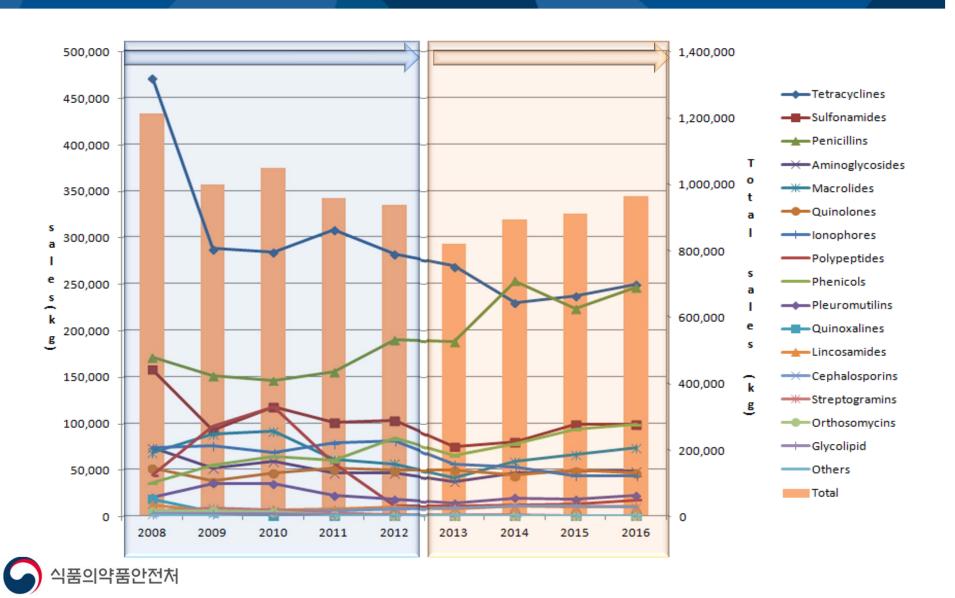
Major outcomes of national AMR management programs

Major outcomes of National programs

- Ban of adding antimicrobials in animal feed (MAFRA, 2011)
- Provide **government subsidies** for **organic** live stock farms (2008)
- Expansion of HACCP certified farms
- Adoption of seafood traceability system
 (Ministry of Oceans and Fisheries, 2008)
- Adoption of mandatory prescription by veterinarians (MAFRA, 2013)
- Public relation and education (2003~)
- Medicinal waste recovery system (MoE, 2010)

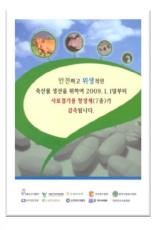


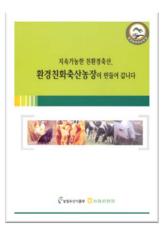
Major outcomes of National projects



Major outcomes of public relation & education

• Guidelines for public education









Educations on animal and aqua farms for prudent use of antimicrobials











Major outcomes of public relation & education

Public educations (TV shows)







Public educations (leaflets)



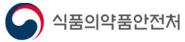










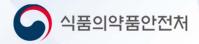


Major outcomes of public relation & education

Collection and dispose of unused drugs







Future directions

Establish and implement national antibiotics- resistance management action plan(2016~)

Vision

Reduce the use of antibiotics, use a proper amount, and prevent distribution of resistant bacteria

⇒ Protect the public from antibiotic-resistance.

Target

[Human]

- Compared to 2015, by 2020

[Non-human]

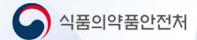
- Reduce the volume of antibiotics usage by 20%
- Reduce the volume of antibiotics prescription for upper airway infection by 50%.
- Reduce the volume of antibiotics prescription for respiratory diseases by 20%.
- Reduce the resistance of Staphylococcus aureus against methicillin by 20%

- Increase the number of antibiotics items for prescription by veterinarians by two folds
- Chicken: Reduce the resistance to fluoro-quinolone against colon bacteria by 10%

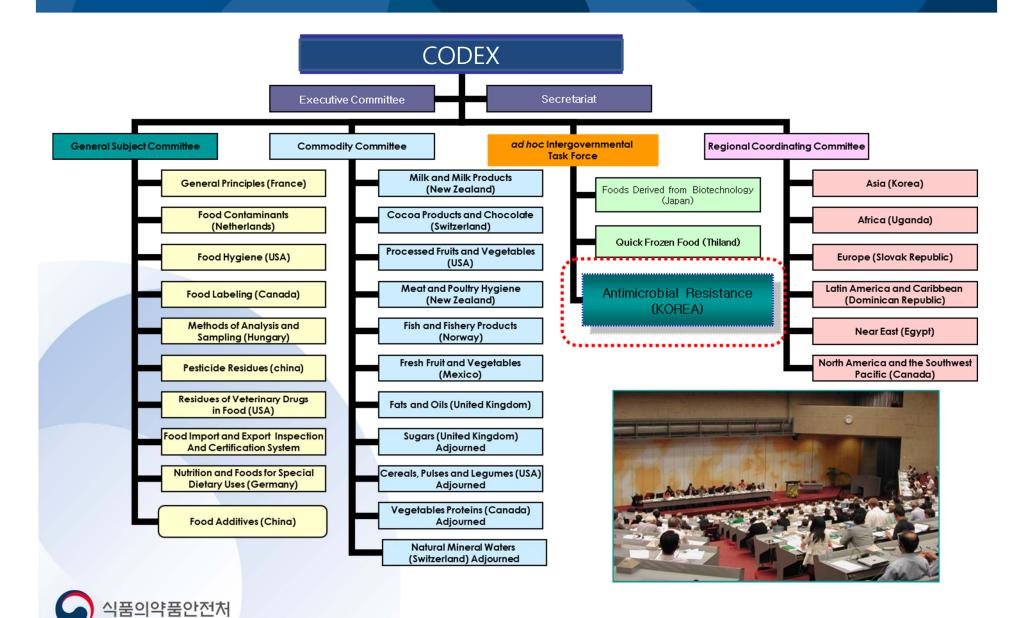


CODEX ad hoc TF AMR

- The Codex ad hoc Intergovernmental Task Force on Antimicrobial Resistance (TFAMR) established in the Codex Alimentarius Commission (CAC) in 2006
- The 1st through 4th Codex TFAMR held in Korea (2007~2010)
 - Guidelines on risk assessment of foodborne antimicrobial resistance
- The 5th Codex TFAMR holding in Jeju, Korea in 2017
 - Revision of the Code of Practice to Minimize and Contain Antimicrobial Resistance (CAC-PCP 61-2005)
 - Propose draft Guidelines on integrated surveillance of antimicrobial resistance



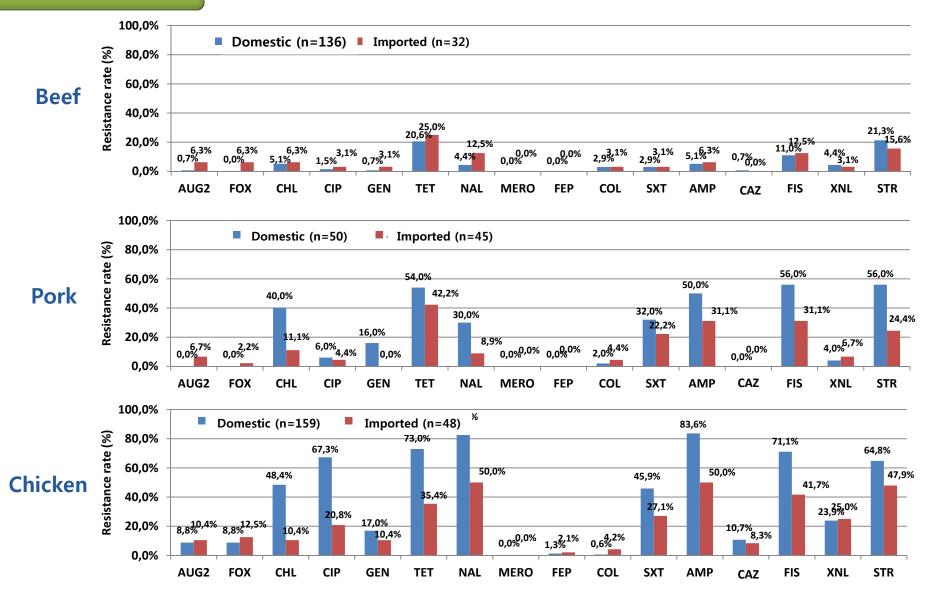
CODEX ad hoc TF AMR





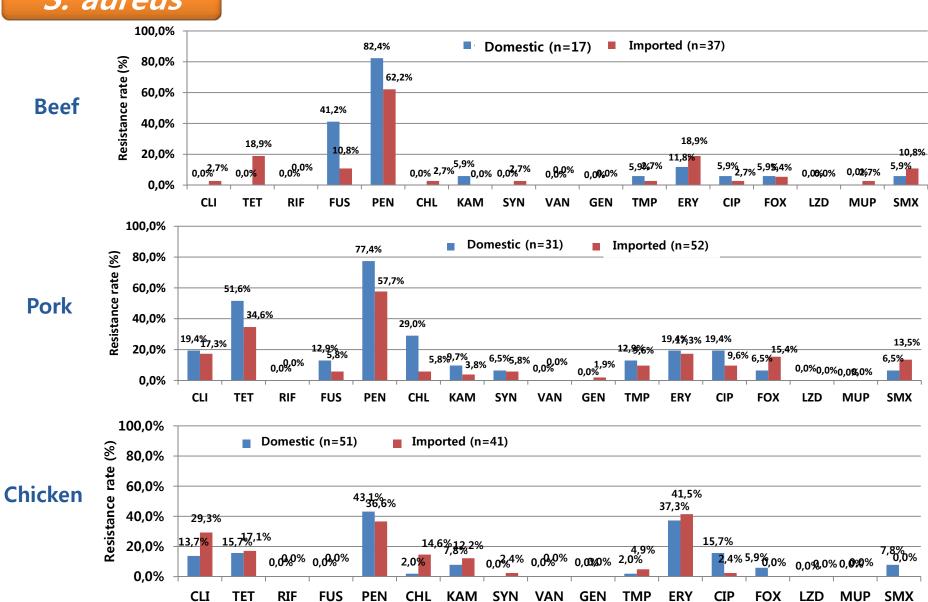
Domestic vs. Imported (y2017)

E. coli

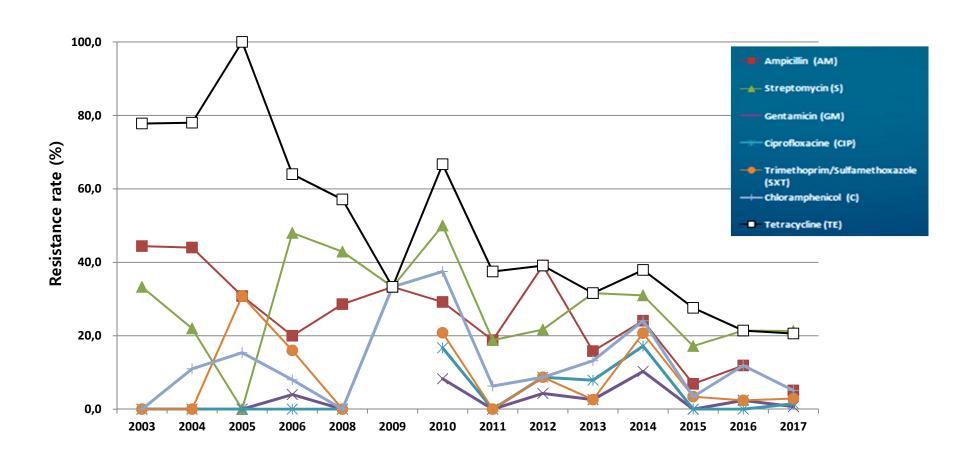


Domestic vs. Imported (y2017)

S. aureus

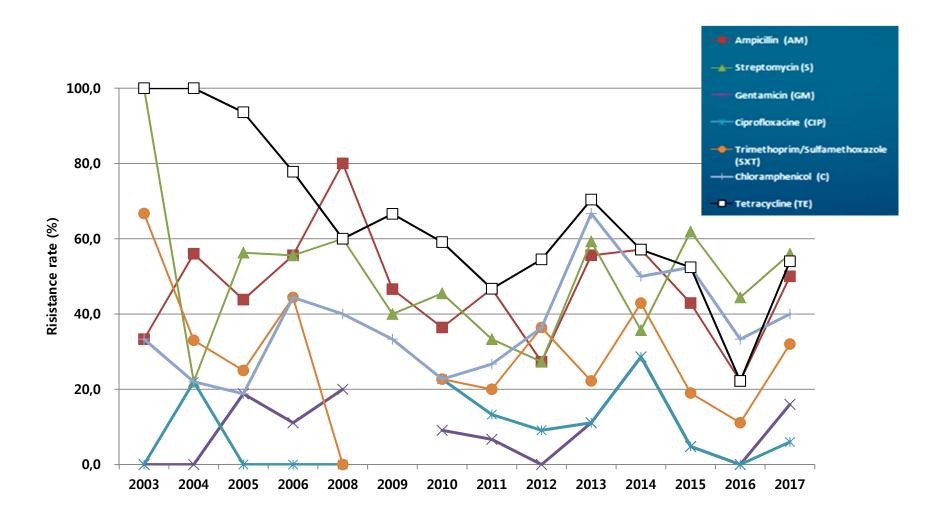


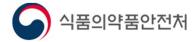
Resistance in *E. coli* (domestic beef)



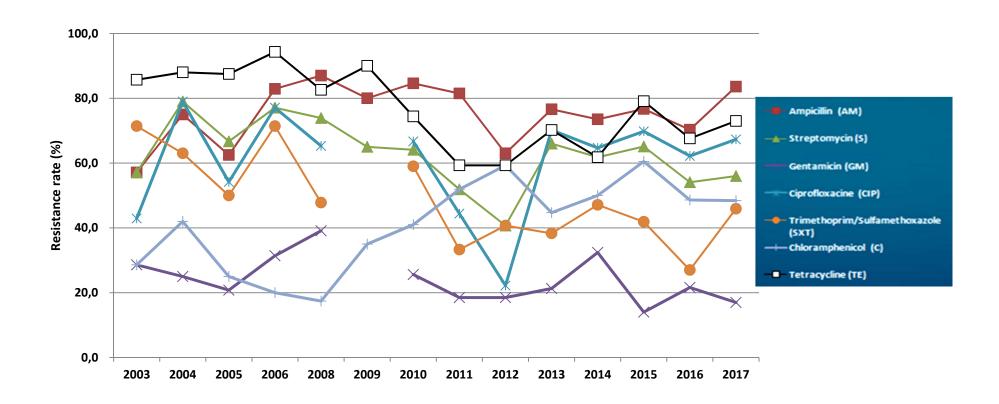


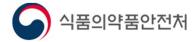
Resistance in *E. coli* (domestic pork)



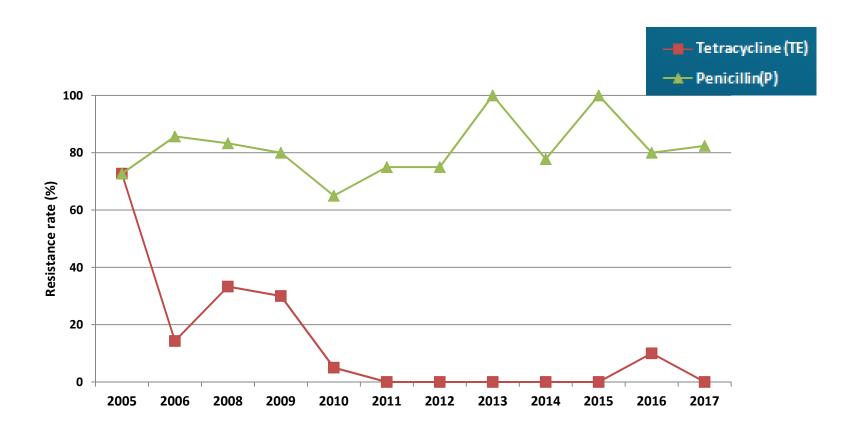


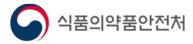
Resistance in *E. coli* (domestic chicken)



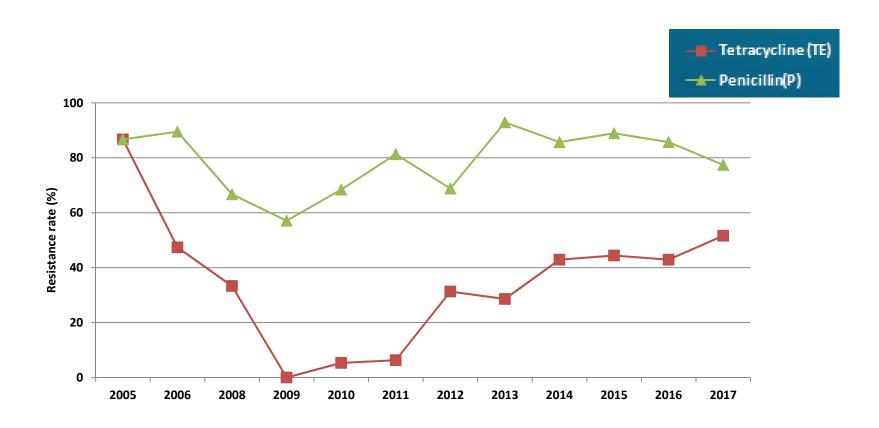


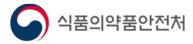
Resistance in *S. aureus* (domestic beef)



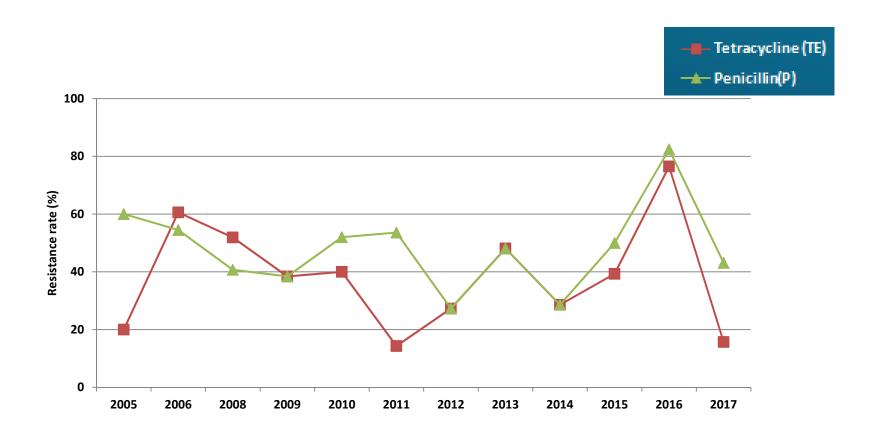


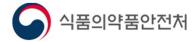
Resistance in *S. aureus* (domestic pork)





Resistance in S. aureus (domestic chicken)



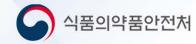


Monitoring outcome reporting

- Published integrated, non-clinical national antibiotics usage and resistance statistics report (livestock, farm products, and fishery products)
- Published via the website (www.mfds.go.kr)







Conclusion

- Korean government tried to slow down the spread of resistance by "national antimicrobial-resistance management program" started since 2003.
- National Action Plan on Antimicrobial Residence in accordance with WHO's global action plan propositions since 2016 engaged in clinical and non-clinical national programs as part of the ONE-HEALTH approach
- Major outcomes of last 15 yrs of National AMR management Programs include banning addition of antibiotics to animal feeds and introduction of mandatory prescription by vets.
- Due to the ban on mixing in the feed, which resulted in a significant reduction in the usage of tetracycline, it turned out that the resistance against this drug reduced significantly.
- MFDS (NIFDS) is planning to continue its role of AMR management, including overseeing non-clinical areas such as livestock, fishery, environment, and foods, to reduce the AMR and ensure proper use of antibiotics.



