MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT	**SOCIALIST REPUBLIC OF VIETNAM**
--------	**Independence – Freedom – Happiness**

No: 2625/QD-BNN-TY	*Hanoi, June 21, 2017*

DECISION

PROMULGATING THE "NATIONAL ACTION PLAN ON ANTIMICROBIAL USE MANAGEMENT AND ANTIMICROBIAL RESISTANCE PREVENTION IN ANIMAL HUSBANDRY AND AQUACULTURE IN THE 2017-2020 PERIOD"

MINISTER OF AGRICULTURE AND RURAL DEVELOPMENT

Pursuant to the Law on Veterinary Medicine dated June 19, 2015;

Pursuant to the Government's Decree No. 35/2016/ND-CP dated May 15, 2016 on Guidelines for the Law of Veterinary Medicine;

Pursuant to the Government's Decree No. 15/2017/ND-CP dated February 17, 2017 defining Functions, Tasks, Powers and Organizational Structure of the Ministry of Agriculture and Rural Development;

At the proposal of the Director of the Department of Animal Health,

HEREBY DECIDES:

Article 1. Issue together with this Decision the "National Action Plan on Antimicrobial Use Management and Antimicrobial Resistance Prevention in Animal Husbandry and Aquaculture in the 2017-2020 Period".

Article 2. This Decision is in effect from the date of signing.

Article 3. Chief of the Ministry Office, the Director of the Department of Animal Health, head of relevant Ministry-affiliated units and Directors of provincial Departments of Agriculture and Rural Development have the responsibility to implement this Decision./.

ON BEHALF OF THE MINISTER
DEPUTY MINISTER

Vu Van Tam

NATIONAL ACTION PLAN

FOR ANTIMICROBIAL USE MANAGEMENT AND ANTIMICROBIAL RESISTANCE PREVENTION IN ANIMAL HUSBANDRY AND AQUACULTURE IN THE 2017-2020 PERIOD

(Issued together with the Minister of Agriculture and Rural Development's Decision No. 2625/QD-BNN-TY dated June 21, 2017)

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Section 1

THE NECESSITY FOR A PLAN

PROPOSITION

The invention of antimicrobials in 1928 was a huge step in medicine for treatment of bacterial diseases. Many previously-fatal bacterial diseases can now be treated by antimicrobials. Since then, hundreds of different antimicrobials and bactericides have been invented and put into use. Antimicrobials are not only used to treat humans but also widely used in agriculture for disease prevention and treatment in livestock and aquatic organisms, and are also added to animal feed to stimulate growth. Concurrent with widespread use and abuse of antimicrobials in disease treatment in humans, livestock and aquatic organisms is the emergence and escalation of microorganisms' resistance to antimicrobials.

Antimicrobial resistance affects the food and agricultural production system, causes environmental pollution, endangering people's health and lives. It is difficult to estimate the severity of antimicrobial resistance due to lack of an appropriate surveillance system. However, a

research predicts that around the year 2050, antimicrobial resistance can claim the lives of 10 million people per year, which also means one death by antimicrobial-resistant bacteria every 3 seconds, more than the current number of cancer patients.

In recent years, there is plenty scientific evidence that shows the increasing threat of antimicrobial resistance in Vietnam. The World Health Organization (WHO) ranks Vietnam as one of the countries with the highest antimicrobial resistance rates.

At international level, the Food and Agriculture Organization (FAO), World Organization for Animal Health (OIE), and WHO have formed a tripartite agreement. The agreement specifies antimicrobial resistance as one of the three prioritized collaboration topics and formulates a Global Action Plan on prevention of antimicrobial resistance [6]. In 2015, with the "One Health" vision, the Global Action Plan created a common framework as basis for states to formulate their own action plans to tackle antimicrobial resistance. The plan has 5 strategic objectives and main actions that the parties concerned have to take to address antimicrobial resistance. The strategic objectives consist of raising awareness and understanding of antimicrobial resistance; strengthening the knowledge and evidence base through surveillance and research; reducing the incidence of infection through effective sanitation, hygiene and infection prevention measures; optimizing use of antimicrobial medicines in human and animal health; increasing investment in invention and production of drugs, diagnosis tools, new vaccines and other interventions.

In the World Health Assembly meeting held in May 2015, the WHO member states pledged to formulate national action plans to tackle antimicrobial resistance. Alongside the Global Action Plan, FAO also formulated an Action Plan on Antimicrobial Resistance 2016-2020 for supporting the food and agriculture industries in fulfilling that objective;

At regional level, formulation and implementation of national plan to control antimicrobial resistance is specified as one of the three priority actions in the Action Agenda for Antimicrobial Resistance in the Western Pacific Region [4].

At national level, Vietnam is the first Western Pacific state to pass a national action plan on prevention of antimicrobial resistance. This Plan has 6 specific objectives, including emphasis on appropriate use of antimicrobials in crop farming, animal husbandry and aquaculture. In June 2015, the "Aide Memoire of Multi-stakeholder Engagement to Combat Antimicrobial Resistance in Vietnam" was co-signed by the Ministry of Health, the Ministry of Agriculture and Rural Development, Ministry of Industry and Trade, the Ministry of Natural Resources and Environment and development partners including WHO, FAO and OUCRU (Oxford University Clinical Research Unit). All parties pledged to carry out the actions specified in the National Action Plan and adopt the One Health methods in order to create a national antimicrobial resistance surveillance system and intensify education for raising awareness of use of antimicrobials and antimicrobial resistance.

In order to increase support in multidisciplinary approach to control antimicrobial resistance in Vietnam, in June 2016, the Ministry of Health established the National Steering Committee for Prevention of Drug Resistance in the 2016-2020 period (Decision No. 5888/QD-BYT dated October 10, 2016); the Steering Committee consists of 31 members from the signatory Ministries

and external partners. Antimicrobial resistance is also specified as an important component of the Global Health Security Agenda in Vietnam, in which a 5-year plan is formulated to prevent occurrence and spread of antimicrobial resistance through appropriate and effective use of antimicrobials in humans and animals, and a collaboration between the Vietnamese government and its international partners.

Drug resistance in agriculture is one of the 9 subcommittees of the Steering Committee for Prevention of Drug Resistance in pursuance of the Ministry of Health's Decision No. 2888/QD-BYT dated August 5, 2014. In order to perform this Subcommittee's tasks, it is required to formulate the "Nation Action Plan on Antimicrobial Use Management and Antimicrobial Resistance Prevention in Animal Husbandry and Aquaculture in the 2017-2020 Period". This Plan is based on international and regional principles which are appropriate to Vietnam's circumstances, and the main actions have to be designed to fit both common and specific objectives.

I. CURRENT SITUATION

1. The state of antimicrobial resistance

Antimicrobials are compounds that can kill or inhibit the growth of microorganisms such as bacteria, fungi or protozoa [9]. Antimicrobials have been very widely used in the recent decades, helping humankind achieve great progress in treating both humans and animals. Antimicrobials are also the essential instrument for prevention and control of communicable disease outbreaks, contributing to improving livestock productivity, food security and food safety [22]. However, the effectiveness of antimicrobials has been reduced due to the presence of drug-resistant bacteria, as shown by those bacteria having been isolated from humans, animals, food and the environment [7]. Currently, 890 antimicrobial-resistant enzymes has been found in bacteria, more than the number of antimicrobial types produced and most of those enzymes' genetic codes are present in plasmids, which can be easily transmitted within bacterial colonies of the same or different species.

Transmission of antimicrobial-resistant bacteria makes treatment of bacterial infections become less effective or fail, causing adverse clinical effects and even death. There are an estimated 700.000 deaths per year from diseases caused by pathogenic microorganisms such as tuberculosis, malaria or superinfection caused by HIV [18]. It is estimated to reach 10 million by 2050, with increase in drug resistance being one of the causes. The number of deaths reaches 4.730.000 in Asia [18]. It incurs a huge cost to society and the global GDP in 2050 can be 2 to 3.5% less than estimated [18].

Currently, the extent of antimicrobial resistance in Vietnam has not been accurately estimated, but antimicrobial resistance surveillance shows that Vietnam has a high antimicrobial resistance rate, which is increasing over time [16]. A research conducted in Ho Chi Minh City shoes that 43.8% of bacteria isolated from inpatients and 81% of *Enterobacteriaceae* bacteria isolated from emergency wards have enzymes called extended-spectrum beta-lactamases (ESBL) [10]. Extended-spectrum β-lactamases can disable most β-lactam antibiotics, especially Penicillin and third-genaration Cephalosporin.

Resistance to fluoroquinolones in isolated *Salmonella Typhi* (typhoid-causing bacteria) increased from 4% to 97% in the 1993-2005 period. Resistance to Tetracycline and Chloramphenicol is also on the rise. Concurrently, from 1997 to 2008, there was a rise of drug resistance in *Streptococcus suis* bacteria, which is the primary cause of meningitis among Vietnamese adults.

2. Antimicrobials and antimicrobial resistance in Vietnamese animal husbandry and aquaculture

In animal husbandry, antimicrobials are used for prevention, preventive treatment, treatment of disease or growth stimulation. Antimicrobials are used in disease prevention when one individual or one herd of healthy livestock is exposed to communicable disease pathogens. Antimicrobials are also used for preventive treatment in livestock in the same group as infected livestock. Antimicrobials are used for treating livestock that have symptoms of communicable diseases.

In case of growth stimulation, antimicrobials are added to animal feed in amounts less than the ones required for treatment in order to enhance the animals' metabolism, hence reducing the rearing time as well as the total amount of food required for each rearing cycle.

Animal husbandry contributes 30% of Vietnamese total agricultural output, with small-scale animal husbandry in agricultural households contributes 70% of the animal husbandry industry's total value. The animal husbandry industry's annual output includes 29.1 pigs and 364.5 poultry (chickens and ducks) [8]. Aquaculture is also growing rapidly. In 2010, Vietnam produced 1.3 million tonnes of catfish and 400,000 tonnes of shrimps, with export revenue of USD 2.8 billion [19].

A number of researches in this period show that alongside the development of animal husbandry and aquaculture is the widespread use of antimicrobials in treatment and epidemic control in those industries. A survey conducted on 208 poultry farms in Tien Giang province shows high use of antimicrobials (the amount of antimicrobials used per bird is 6 times the recorded amount in some European countries), with 84% being used for disease prevention [3]. The use of animal feed with antimicrobial mixed in is also very high. In each rearing cycle, 72% of animal farms use at least one type of antimicrobial for disease prevention or growth stimulation. Antimicrobials are also abused in pig farming (286.6 mg of active ingredient per kg of live pig). Even some antimicrobials which are considered important for disease treatment in humans are also used in animal husbandry [25].

Alongside the surveys on antimicrobial use, researches on drug-resistant bacteria in animals and animal-based products have also been carried out. 202 *Campylobacter* species isolated from 343 pig and poultry farms in the Mekong Delta have drug resistance rate as follows: 100% are resistant to Erythromycin, 99% are resistant to Sulfamethoxazole-Trimethoprim, 92% are resistant to Nalidixic acid and Ofloxacin and 20.8% are resistant to Ciprofloxacin [2]. Besides, in 895 species of *Escherichia coli* isolated from 208 small-scale poultry farm in this area, 20% are resistant to Gentamicin and 32.5% are resistant to Ciprofloxacin. Resistance to Ciprofloxacin is certainly related to Quilonone use in those farms [17]. A survey on antimicrobial resistance of *Salmonella* spp isolated from 318 pork and chicken samples in the retail markets of the Northern region of Vi etnam shows that 58.5% are resistant to Tetracycline, 58.1% are resistant to

Sulphonamides, 47.3% are resistant to Streptomycin, 39.8% are resistant to Ampicillin, 37.3% are resistant to Chloramphenicol, 34.0% are resistant to Trimethoprim, and 27.8% are resistant to Nalidixic acid [23]. A research on antimicrobial resistance in aquatic products also shows that 18% of *Escherichia coli* species isolated from 60 shrimp sample in a Nha Trang market have ESBL, 55% of which are resistant to many types of drugs [20].

3. Causes of antimicrobial resistance in Vietnam

3.1. Health and agricultural causes

a) Inappropriate antimicrobial use, such as overdose, underdose or abuse, resulting in drug resistance, enabling drug-resistance microorganisms to appear, transform and spread. Purchase of antimicrobials and treatment carried out by oneself (not following prescriptions of medical doctors in the case of humans or veterinarians in the case of animals) [15]. Pathogenic bacteria, virus, parasites not being treated by appropriate drugs. Incorrect dosage, concentration and use time.

b) tests and inspections still being insufficient, the quality control scheme has not yet met the actual needs; inability to ensure quality control of all individual batches of each type of product available on the market.

c) Ineffective prevention and control of communicable diseases in both humans and animals, leading to increased spreading of drug-resistant bacteria. Infected humans, animals and aquatic organisms undergoing treatment can transmit drug-resistant microorganisms to other humans, animals and the environment.

3.2. Causes arisen from animal husbandry and aquaculture

a) Insufficient regulations on management and use of antimicrobial for disease prevention and treatment, growth stimulation, control of infection and transmission of drug-resistant bacteria in animal husbandry and aquaculture in Vietnam [24].

- Negligent implementation of regulations of law.

- A surveillance system for drug resistance in animal husbandry and aquaculture not yet established. Surveillance of drug resistance has only been carried out in a number of researches and projects and not regularly.

- No connection between antimicrobial surveillance systems in health and agricultural sectors.

- Lack of test facilities which have sufficient capacity for accurate determination of drug-resistant microorganisms, causing difficulties in detection of recently discovered drug-resistant microorganisms.

- Antimicrobial abuse for the purpose of disease prevention in animal husbandry and aquaculture. Antimicrobial abuse for the purpose of growth stimulation. Use of antimicrobials

with amounts less than the ones required for treatment increases drug resistance of bacteria, which can be easily transmitted to humans through direct contact, or indirectly through consumption of animal-based food, or humans being in contact with airborne bacteria released by animals [11].

- Lack of awareness of antimicrobial use and resistance among the community, even among specialists.

- Veterinarians' prescriptions not required for trading antimicrobials.

4. Consequences of antimicrobial resistance

Even though the extent that antimicrobial use in animals can worsen antimicrobial resistance in humans, and the severity of that relationship, has not yet been determined, there has been clear evidence of this problem. This problem is revealed by factual evidence, which is humans and animals both use a number of similar antimicrobials, with similar mechanisms of actions and resistance mechanisms. Nearly 90 years since the first use of antimicrobial, humankind is facing the prospect of some infections having to effective antimicrobial treatment, especially infections related to chemotherapy, tissue and organ transplant.

Prevention and treatment of bacterial diseases in both humans and animals will become much more difficult, due to antimicrobials having little to no effect on those diseases. The social and financial costs for treatment for drug-resistant bacterial diseases will increase greatly for individuals, families and the society due to prolonged treatment period, negative prognoses and waste caused by spending on inappropriate drugs.

II. LEGAL BASIS

- Law on Pharmacy No. 105/2016/QH13 dated April 6, 2016.

- Law on Prevention of Infectious Diseases No. 03/2007/QH12 dated November 21, 2007.

- Law on Veterinary Medicine No. 79/2015/QH13 dated June 19, 2016.

- Minister of Health’s Decision No. 2174/QD-BYT dated June 21, 2013 ratifying the National Action Plan to Combat Drug Resistance.

- Decision No. 5888/QD-BYT dated October 10, 2016 on establishment of the National Steering Committee for Prevention of Drug Resistance in the 2016-2020 period.

- Decision No. 2888/QD-BYT dated August 5, 2014 on establishment of 9 Drug Resistance Surveillance Subcommittees.

- Circular No. 04/2016/TT-BNNPTNT dated May 10, 2016 on epidemic prevention in aquatic animals.

- Circular No. 26/2016/TT-BNNPTNT dated June 30, 2016 on quarantine of aquatic animals and animal products.

- Circular No. 25/2016/TT-BNNPTNT dated June 30, 2016 on quarantine of terrestrial animals and animal products.

- Circular No. 13/2016/TT-BNNPTNT dated June 2, 2016 on veterinary drug management.

- Circular No. 09/2016/TT-BNNPTNT dated January 6, 2016 on animal slaughter control and veterinary hygiene inspection.

- Circular No. 07/2016/TT-BNNPTNT dated May 31, 2016 on epidemic prevention in terrestrial animals.

- Ministry of Agriculture and Rural Development's Decision No. 2803/QD-BNN-TY dated July 7, 2016 promulgating the "Plan for Management and Surveillance of Imported Antimicrobial Ingredients for Veterinary Drug Production in the 2016-2020 period."

Section 2

THE PLAN'S SPECIFICS

I. OBJECTIVES

1. Common objectives:

Minimize the risk of antimicrobial resistance among the community by controlling antimicrobial use in animal husbandry and aquaculture in Vietnam.

2. Specific objectives:

2.1. Review, amend and implement management regulations and policies relevant to antimicrobial resistance and use in animal husbandry and aquaculture.

2.2. Raise awareness of antimicrobial use and the risk of antimicrobial resistance among technical staff, food and agricultural specialists, farmers and consumers.

2.3. Adopt good practice in diagnosis, treatment, animal feed production, animal husbandry and aquaculture.

2.4. Carry out surveillance of antimicrobial use, residue and resistance in animal husbandry and aquaculture.

2.5. Facilitate interdisciplinary activities in antimicrobial resistance management.

II. TASKS TO BE UNDERTAKEN

1. Consolidating the system of directing management of antimicrobials and antimicrobial resistance

1.1. Consolidate the subcommittee in charge of antimicrobial resistance in animal husbandry and aquaculture, affiliated with the National Steering Committee for prevention of drug resistance in humans, livestock and the environment.

1.2 Establish the Steering Subcommittee for Prevention of antimicrobial resistance in animal husbandry and aquaculture in the Ministry of Agriculture and Rural Development.

1.3. Step up implementation of the National Steering Subcommittee for Prevention of antimicrobial resistance in animal husbandry and aquaculture

2. Perfecting the legislative document on management of antimicrobials and antimicrobial resistance

2.1. Identify omissions and illogical overlaps in the existing legislative documents relevant to antimicrobial management and antimicrobial resistance surveillance in animal husbandry and aquaculture.

2.2. Gradually eliminate to and eventually prohibit the use of antimicrobials for animal growth stimulation (pursuant to Circular No. 06/2016/TT-BNNPTNT).

2.3. Formulate documents for restriction and eventual prohibition of antimicrobial use for disease prevention in animals.

2.4. Review and amend the regulations on prescription issuance and sale of prescription antimicrobial drugs, including providing instructions on and control of prescription issuance and sale of antimicrobials in veterinary activities.

2.5. Review the regulations on surveillance of antimicrobial use, from import to management of circulation in agriculture, in legislative documents (also including antimicrobial management database and reports).

3. Inspecting the implementation of legislative documents

3.1. Inspect the entities related to trade or use of antimicrobials in animal husbandry and aquaculture, from import to farms.

3.2. Step up surveillance of antimicrobial residue in animal-based food produced for both export and domestic consumption, and announcement of the results.

4. Raising awareness of antimicrobial usage and the risk of antimicrobial resistance

4.1. Evaluate the awareness of antimicrobial use and resistance management through survey on the chosen entities' knowledge, attitude and practice, including animal farmers, aquaculturists, technical staff, specialists and consumers.

4.2. Create communication programs and tools to raise awareness of antimicrobial use and resistance management.

4.2.1. Create communication tools (including leaflets, posters on antimicrobials and antimicrobial resistance) to raise awareness of antimicrobial use and antimicrobial management.

4.2.2. Conduct communication operations on antimicrobial use and resistance management with primary representatives of veterinary medicine, animal husbandry and aquaculture authorities.

4.2.3. Increase participation of animal husbandry and aquaculture industries in the annual antimicrobial resistance awareness week.

4.2.4. Carry out communication operations for raising awareness of antimicrobial resistance to cattle and poultry farmers, aquaculturists and consumers through mass media (television, press and radio), social media (Facebook, Twitter and Zalo), communication tools and events.

5. Adopting good practice in treatment, animal feed production, animal husbandry and aquaculture

5.1. Good practice in antimicrobial use

5.1.1. Create guidelines for antimicrobial use in animal husbandry and aquaculture using the risk assessment approach.

5.1.2. Organize training for good practice in antimicrobial use in animal husbandry and aquaculture for the following entities:

- Technical staff and specialists.

- Lecturers (veterinarians) who will train proprietors and producers in the animal husbandry industry.

Develop the cooperative relationship between the public and private sectors in order to adopt good practice in antimicrobial use; focusing on semi-industrial animal farms.

5.1.4. Incorporate antimicrobial use and resistance into the animal husbandry-veterinary medicine syllabuses of universities and vocational schools, as well as additional training programs for technical staff and specialists.

5.2. Encourage the use of alternatives to antimicrobials

5.2.1. Step up good practice in animal husbandry in order to decrease the demand for antimicrobial treatment in farms, focusing on biological safety, immunization, and sanitation throughout the food production chain.

5.2.2. Assist in diagnosis methods and encourage carrying out diagnoses before deciding to use antimicrobials for treatment.

5.2.3. Encourage researching and evaluating effectiveness of alternatives to antimicrobials such as biologicals.

6. Surveillance of antimicrobial resistance, use, and residue

6.1. Identify the number of occurrences and characteristics of antimicrobial resistance in animals and the food production chain

6.1.1. Use testing laboratories map generating tools to evaluate the capacity for microorganism and antimicrobial tests on food and animals of current testing laboratories.

6.1.2. Make a list of testing laboratories participating in the national surveillance program for antimicrobial resistance in food and animals (hereinafter referred to as the List of testing laboratories), including private testing laboratories. Designate the leading national testing laboratory for this activity.

6.1.3. Create standards for antimicrobial resistance tests (based on ISO and CLSI standards); organize training courses for testing laboratories in the aforementioned list in order to ensure testing quality and uniform application of standards.

6.1.4. Step up management of antimicrobial and antimicrobial resistance testing quality, with the leading national testing laboratory as the top priority, then the laboratories on the List of testing laboratories.

6.1.5. Formulate a national surveillance program for antimicrobial resistance in food and animals:

a) Objective: Estimate the occurrence rate of antimicrobial resistance and detect antimicrobial resistance genes

b) Chosen entities and time:

- Livestock: pigs and chickens

- Scale of production: Large and small farms

- Sample collection period: right before slaughter

- Bacteria species under surveillance: *E. coli* and *Salmonella*

- Antimicrobials: Chloramphenicol, Tetracycline, Cephalosporin and Tylosin

6.1.6. Formulate a national surveillance program for antimicrobial resistance in farmed aquatic organisms:

a) Objective: Estimate the occurrence rate of antimicrobial resistance and detect antimicrobial resistance genes

b) Chosen entities and time:

- Aquatic species: shark catfish, tilapia, giant tiger prawn, whiteleg shrimp

- Bacteria species under surveillance: *E. coli*, *Salmonella*, *Vibrio spp.* and *Aeromonas spp*.

- Antimicrobials: Ampicillin, Amoxycillin, Florfenicol, Oxytetracycline, Enrofloxacin, Norfloxacin, Trimethoprim/sulfamethoxazole, Sulfadimidine, Gentamicin

6.1.7. Implementation method: Combine with the existing surveillance programs on food safety. Employ the risk assessment method; regularly update the surveillance program on antimicrobial resistance.

6.1.8. Create a central database system in order to facilitate management and analysis of antimicrobial resistance data.

6.1.9. Share the national surveillance program for antimicrobial resistance's results among all participating testing laboratories in print or online, quarterly or in annual meetings.

6.1.10. Establish collaborative programs with research partners in order to continue studying and identify characteristics of antimicrobial-resistant bacteria in food and animals, such as investigations of animal farms.

6.2. Identify the number of occurrences and characteristics of antimicrobial resistance in animal husbandry and aquaculture

6.2.1. Formulate and implement a national surveillance program for antimicrobial resistance in animal husbandry and aquaculture; employ the data on imported antimicrobials as primary entry data

6.2.2. Create a national database for the purpose of facilitating management and analysis of antimicrobial management data and serving as basic parameters for OIE in global management of antimicrobial use in livestock.

6.2.3. Share the national surveillance program for antimicrobial use management’s results among the parties concerned.

6.2.4. Cooperate with research partners to provide additional knowledge on antimicrobial use in animal husbandry and aquaculture.

6.3. Evaluate the correlation between antimicrobial use management in animal husbandry, aquaculture and consequences of antimicrobial resistance in Vietnam

6.3.1. Evaluate the correlation between antimicrobial use management in animal husbandry, aquaculture and occurrence of antimicrobial resistance in animals and food to prepare for reduction of antimicrobial use in the future, using the risk assessment approach.

6.3.2. Identify the number and characteristics of antimicrobial residue occurrences in animal-based products

6.3.3. Carry out regular surveillance of antimicrobial residue in animal-based food produced for both export and domestic consumption.

6.3.4. Share the surveillance program for antimicrobial residue's results among the parties concerned in print, online or in quarterly or annual meetings.

7. Increasing interdisciplinary activities in antimicrobial resistance management

7.1. Develop a multidisciplinary approach on management and regulation of activities related to antimicrobial use, resistance and residue.

7.2. Participate in the National Steering Committee’s regular meetings in order to discuss, share experience and cooperate in ongoing and upcoming activities.

7.3. Organize communication activities and advocate common policies between health and veterinary medicine authorities in order to raise awareness of antimicrobial resistance, such as organizing the annual antimicrobial resistance awareness week.

7.4. Enhance the partnership between public and private sectors in order to raise awareness of antimicrobial resistance in animal husbandry and aquaculture among specialists of multiple disciplines, such as stepping up good practice and disseminating training materials.

7.5. Share data on antimicrobials, antimicrobial resistance and surveillance of residue among health, veterinary medicine and environmental authorities. Conduct joint surveillance of potential developments of antimicrobials imported for use on both humans and animals.

7.6. Share antimicrobial use and resistance results through joint reports by the health and veterinary medicine authorities.

7.7. Combine with antimicrobial use and resistance management activities at both regional and global levels.

7.8. Participate in regional and global antimicrobial use and resistance management activities in animal husbandry and aquaculture.

7.9. Share data on antimicrobial use and resistance management in Vietnam among international partners, contributing to OIE's global database on antimicrobial management.

Section 3

IMPLEMENTATION

I. RESPONSIBILITY ALLOCATION

1. Department of Animal Health

1.1. Act as the cooperative link to related units to direct and provide instructions on implementation; consolidate the Plan's action results to report to the Minister and Deputy Ministers of Agriculture and Rural Development.

1.2. Present the decision on establishment, functions, responsibilities, operating expenditures of the National Steering Subcommittee for prevention of antimicrobial resistance in animal husbandry and aquaculture.

1.3. Cooperate with the Legal Department in annual review and identification of omissions and illogical overlaps in the existing legislative documents relevant to antimicrobial management and antimicrobial resistance surveillance in animal husbandry and aquaculture, and the demand for those documents.

1.4. Create guidelines for prescription of antimicrobials in treating animals.

1.5. Manage and carry out surveillance of antimicrobial use, import and production.

1.6. Study and evaluate the awareness of antimicrobial use and resistance management.

1.7. Preside over and cooperate with the Department of Animal Husbandry and the Directorate of Fisheries in creating communication documents on antimicrobial usage and resistance.

1.8. Cooperate with the Directorate of Fisheries, the Department of Animal Husbandry and the National Agricultural Extension Center in conducting communication operations on antimicrobial use and resistance management and raising awareness of antimicrobial resistance for representatives of veterinary medicine, animal husbandry, aquaculture industries and consumers.

1.9. Cooperate with the Directorate of Fisheries and the Department of Animal Husbandry in creating guidelines for antimicrobial use in diagnosis and treatment in animal husbandry and aquaculture.

1.10. Participate in the annual antimicrobial resistance awareness week.

1.11. Develop the partnership between public and private sectors to critique policies and legislative documents, alongside sharing information on antimicrobial use.

1.12. Create the content framework of antimicrobial use and resistance in animal husbandry and aquaculture and propose integrating it into animal husbandry-veterinary medicine syllabuses of universities and vocational schools, train technical staff and specialists, including those in the private sector, in that field.

1.13. Step up management of certificate of veterinary medicine practice in providing diagnosis and treatment for animals.

1.14. Assists in diagnosis methods and encourage the use of diagnosis tools to identify cases that need treatment by antimicrobials.

1.15. Formulate a program for control of primary communicable diseases which need to be treated by antimicrobials in livestock and aquatic organisms.

1.16. Encourage evaluating and implementing alternatives to antimicrobials.

1.17. Evaluate the capacity of existing laboratories for carrying out tests for antimicrobial-resistant microorganisms.

1.18. Identify the leading laboratories and create a list of laboratories designated to carry out tests for antimicrobial-resistant bacteria.

1.19. Create standards for antimicrobial-resistant bacteria test methods and organize training courses for the laboratories to participate.

1.20. Formulate and implement a national surveillance program for antimicrobial resistance in food, animals and farmed aquatic organisms.

1.21. Create a central database to facilitate management and analysis of data on antimicrobial resistance; share the results of the surveillance program for antimicrobial resistance among the parties concerned.

1.22. Establish collaborative programs with research partners in order to continue studying and identify characteristics of antimicrobial-resistant bacteria in food and animals.

1.23. Carry out surveillance of antimicrobial residue in terrestrial animal-based food.

1.24. Participate in the National Steering Committee for prevention of drug resistance’s meetings.

1.25. Organize joint communication activities on antimicrobial resistance between health and veterinary medicine industries.

1.26. Raise awareness of antimicrobial resistance in animal husbandry and aquaculture among organizations and individuals.

1.27. Share the results of antimicrobial use and resistance management in order to include them into health and veterinary medicine authorities' joint reports; facilitate analysis of current situations and evaluation of general risks.

1.28. Participate in regional and global antimicrobial use and resistance management activities in animal husbandry and aquaculture; share the data on antimicrobial use and resistance management in Vietnam among international partners.

1.29. Formulate and implement a national program for antimicrobial use management in animal husbandry and aquaculture.

2. Directorate of Fisheries

2.1. Cooperate with the Department of Animal Health, the Department of Animal Husbandry and the National Agricultural Extension Center in conducting communication operations on antimicrobial use and resistance management and raising awareness of antimicrobial resistance for aquaculturists and consumers.

2.2. Cooperate with the Department of Animal Health in creating guidelines for antimicrobial use in aquaculture.

2.3. Participate in the annual antimicrobial resistance awareness week.

3. Department of Animal Husbandry

3.1. Gradually eliminate and eventually prohibit antimicrobial use for growth stimulation in cattle and poultry.

3.2. Gradually eliminate and eventually prohibit antimicrobial use for disease prevention in animals.

3.3. Cooperate with the Department of Animal Health in creating communication documents on antimicrobial use and resistance and guidelines for antimicrobial use in disease treatment and animal feed production.

3.4. Cooperate with the Department of Animal Health, the Department of Animal Husbandry and the National Agricultural Extension Center in conducting communication operations on antimicrobial use and resistance management and raising awareness of antimicrobial resistance for animal farmers and consumers.

3.5. Participate in the annual antimicrobial resistance awareness week.

3.6. Inspect and handle violations committed by organizations and individuals who produce, trade, import, export animal feed that has antimicrobials added for the purpose of growth stimulation.

3.7. Cooperate with the Department of Animal Health in directing animal health Branches to manage and carry out surveillance on animal husbandry facilities, in order to make sure they use veterinary drugs for disease prevention and treatment in accordance with regulations.

3.8. Inform the Department of Animal Health of violating animal husbandry facilities.

4. National Agro-Forestry-Fisheries Quality Assurance Department

4.1. Carry out surveillance of antimicrobial residue in aquatic animal-based food.

4.2. Direct the affiliated units to participate in the surveillance program for antimicrobial resistance in animal husbandry and aquaculture.

4.3. Direct the affiliated units to trace and investigate aquatic product batches that are contaminated with chemicals, antimicrobials that are prohibited or exceed their limits, as notified by the import markets.

4.4. Accurately notify the investigation results on names and addresses of suppliers of chemicals, prohibited antimicrobials and antimicrobial ingredients to the Department of Animal Health so that the violations can be handled.

5. Legal Department

2.1. Identify omissions and illogical overlaps in the existing legislative documents relevant to antimicrobial management and antimicrobial resistance surveillance in animal husbandry and aquaculture.

6. Science, Technology and Environment Department

Prioritize research projects on alternatives to antimicrobials (researches, research-supporting policies, alternative products) and implementation of those alternatives.

7. Financial Department

Balance and raise funds for the central authorities and units to implement the annual National Action Plan on Antimicrobial Use Management and Antimicrobial Resistance Prevention in Animal Husbandry and Aquaculture.

8. National Agricultural Extension Center

8.1. Promote good techniques in animal husbandry in order to reduce demand for treatment by antimicrobials in farms, through agricultural extension programs and related activities.

8.2. Cooperate with the Department of Animal Health, the Department of Animal Husbandry and the Directorate of Fisheries in organizing training activities for antimicrobial use for treatment, in animal husbandry and aquaculture.

8.3. Cooperate with the Department of Animal Health, the Department of Animal Husbandry and the Directorate of Fisheries in conducting communication operations for raising awareness of antimicrobial resistance among cattle and poultry farmers, aquaculturists and consumers.

9. Research Institute for Aquaculture, National Institute of Veterinary Research

9.1. Participate in the surveillance program for antimicrobial resistance in animal husbandry and aquaculture; share the surveillance of antimicrobial resistance's results among the concerned parties.

9.2. Participate in study and evaluation of the awareness of antimicrobial use and resistance management.

9.3. Participate in creating communication documents and guidelines for antimicrobial use and resistance.

9.4. Participate in quantifying the effect of antimicrobial use and resistance management in animal husbandry and aquaculture and the occurrence of antimicrobial resistance in animal husbandry and aquaculture.

10. Provincial Departments of Agriculture and Rural Development

10.1. Direct the departments' affiliated units to manage and carry out surveillance on trading and use of antimicrobials within their jurisdictions.

10.2. Direct the departments' affiliated units to propagate and disseminate guidelines for antimicrobial use and resistance to animal farmers and aquaculturists.

11. Provincial animal health authorities

11.1. Responsible for management and surveillance of antimicrobial trading within their jurisdictions;

11.2. Responsible for management and surveillance of antimicrobial use in animal husbandry facilities;

11.3. Propagate and disseminate guidelines for antimicrobial use and resistance to animal farmers and aquaculturists.

12. Fisheries Branches

12.1. Responsible for management and surveillance of antimicrobial use in aquaculture facilities;

12.2. Propagate and disseminate guidelines for antimicrobial use and resistance to aquaculturists.

13. Antimicrobial import facilities

13.1. Record and keep track of imports and exports of antimicrobials sufficiently;

13.2. Provide reports with accurate data on the numbers of antimicrobial imports, exports and inventory, names and addresses of purchasers of each antimicrobial to the Department of Animal Health and local Animal Health Branches on the 20th of each quarter's last month.

14. Veterinary antimicrobial production facilities

14.1. Create records and documents of antimicrobial ingredient purchase and use;

14.2. Provide reports with accurate data on purchased and used antimicrobial ingredients for production of veterinary drugs, the number of produced and exported veterinary drugs to the Department of Animal Health and local Animal Health Branches on the 20th of each quarter's last month.

15. Veterinary drugstores

15.1. Record and keep track of imports and exports of antimicrobials sufficiently;

15.2. Provide reports with accurate data on antimicrobial imports and exports to the provincial Animal Health Branches.

15.3. Do not trade antimicrobial ingredients.

15.4. Sell antimicrobials in accordance with prescriptions and guidelines of animal health staff only.

16. Animal husbandry and aquaculture facilities

16.1. Have records of antimicrobial use for animal husbandry and aquaculture.

16.2. Provide sufficient and accurate documents on where antimicrobials are purchased to the authorities upon request.

16.3. Use antimicrobials in accordance with prescriptions and guidelines of animal health staff only.

II. TASKS AND TIMELINES: Enclosed appendix

Section 4

FUNDING FOR IMPLEMENTATION

1. Central funding

a) The Ministry of Agriculture and Rural Development allocates funds to ministry-affiliated units which are assigned to preside over the tasks specified in the Appendix.

b) The assigned central-affiliated units in this plan are responsible for mobilizing the system's resources for implementation.

2. Local funding

Annually, pursuant to this Plan and the local surveillance program for food safety, the Department of Agriculture and Rural Development presides over and cooperate with relevant units in formulating plans and presenting them to the provincial People's Committee for approval and implementation funds.

3. Other funding

Mobilize funding from international organizations such as FAO, USAID, WHO, World Bank or capital from other non-governmental organizations.

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APPENDIX

TASKS AND TIMELINES

No.	Tasks to be undertaken	Presiding unit	Cooperating unit	Timeline
1.	Present the decision on establishment, functions, responsibilities, operating expenditures of the National Steering Subcommittee for prevention of antimicrobial resistance in animal husbandry and aquaculture.	Department of Animal Health	Directorate of Fisheries, Department of Animal Husbandry	2017
2.	Identify omissions and illogical overlaps in the existing legislative documents relevant to	Legal Department	Department of Animal Health, Department of Animal Husbandry,	2017 - 2020

	antimicrobial management and antimicrobial resistance surveillance in animal husbandry and aquaculture.		Directorate of Fisheries, National Agro-Forestry-Fisheries Quality Assurance Department	
3.	Gradually eliminate to and eventually prohibit the use of antimicrobials for animal growth stimulation (pursuant to Circular No. 06/2016/TT-BNNPTNT).	Department of Animal Husbandry	Department of Animal Health	2017
4.	Formulate documents for restriction and eventual prohibition of antimicrobial use for disease prevention in animals.	Department of Animal Husbandry	Department of Animal Health	2017 - 2020
5.	Create guidelines for prescription issuance and sale of prescription antimicrobials	Department of Animal Health	Legal Department	2018
6.	Review and create documents for management and surveillance of antimicrobial use, import and production	Department of Animal Health	Department of Animal Husbandry, Directorate of Fisheries	2017-2020
7.	Inspect the entities related to trade or use of antimicrobials in animal husbandry and aquaculture, from import to farms.	Department of Animal Health	Department of Animal Husbandry, Directorate of Fisheries	Annually
8.	Step up surveillance of antimicrobial residue in animal-based food produced for both export and domestic consumption, and announcement of the results.	Department of Animal Health, National Agro-Forestry-Fisheries Quality Assurance Department		Annually
9.	Research and evaluate the awareness of antimicrobial use and resistance management of the chosen entities, including animal farmers, aquaculturists, technical staff, specialists and consumers.	Department of Animal Health	National Institute of Veterinary Research, Research Institute for Aquaculture, Animal Husbandry-Animal Health Branches, Fisheries Branches	2017-2018
10.	4.2.1. Create communication tools (including leaflets, posters) on antimicrobial use and antimicrobial management.	Department of Animal Health, National Agricultural	Directorate of Fisheries, Department of Animal Husbandry	2018

		Extension Center		
11.	Conduct communication operations on antimicrobial use and resistance management with primary representatives of veterinary medicine, animal husbandry and aquaculture sectors.	Department of Animal Health, Directorate of Fisheries, Department of Animal Husbandry, National Agricultural Extension Center	National Agro-Forestry-Fisheries Quality Assurance Department; provincial Departments of Agricultural and Rural Development, Animal Husbandry-Animal Health Branches, Agro-Forestry-Fisheries Quality Assurance Branches and Fisheries Branches; veterinary drug, animal feed production and trade companies; societies and associations; mass media agencies.	2018 - 2020
12.	Conduct communication operations for raising awareness of antimicrobial resistance among cattle and poultry farmers, aquaculturists and the populace.	Department of Animal Health, Directorate of Fisheries, Department of Animal Husbandry, National Agricultural Extension Center	National Agro-Forestry-Fisheries Quality Assurance Department; provincial Departments of Agricultural and Rural Development, Animal Husbandry-Animal Health Branches, Agro-Forestry-Fisheries Quality Assurance Branches and Fisheries Branches; veterinary drug, animal feed production and trade companies; societies and associations; mass media agencies.	2018 - 2020
13.	Formulate guidelines for antimicrobial use in animal husbandry and aquaculture.	Department of Animal Health	Department of Animal Health, Directorate of Fisheries, National Institute of Veterinary Research, Research Institute for Aquaculture	2018-2020
14.	Organize training activities for antimicrobial use for treatment, in animal husbandry and aquaculture.	National Agricultural Extension Center	Department of Animal Health, Department of Animal Husbandry, Directorate of Fisheries	2018-2020
15.	Develop the partnership between public and private sectors to adopt good animal husbandry	Department of Animal Health	Veterinary drug, animal feed production and trade companies and associations	Annually

	practice in antimicrobial use.	Department of Animal Husbandry Aquaculture Department		
16.	Create the content framework of antimicrobial use and resistance in animal husbandry and aquaculture and propose integrating it into animal husbandry-veterinary medicine syllabuses of universities and vocational schools, train technical staff and specialists, including those in the private sector, in that field.	Department of Animal Health	Animal Husbandry-Animal Health Branches Veterinary drug, animal feed production and trade companies	2020
17.	Step up management of certificates of practice for animal health staff, provide additional training for good practice in antimicrobial use.	Department of Animal Health	Provincial Veterinary Associations and Animal Husbandry-Animal Health Branches	2019-2020
18.	Provide training in animal husbandry's good techniques in order to reduce demand for treatment by antimicrobials in farms, through agricultural extension programs and related activities.	National Agricultural Extension Center	Department of Animal Husbandry, Aquaculture Department, provincial Agricultural Extension Centers	2018 - 2020
19.	Assists in diagnosis methods and encourage the use of diagnosis tools before carrying out treatment by antimicrobials.	Department of Animal Health	Science, Technology and Environment Department and Planning Department of Ministry of Agricultural and Rural Development; provincial Animal Health Branches	Annually
20.	Formulate a program for control of primary communicable diseases that require plenty antimicrobials for treatment in livestock and aquatic organisms.	Department of Animal Health	Provincial Veterinary Associations, National Institute of Veterinary Research, veterinary drugs production and trade companies	2018 - 2020
21.	Encourage evaluation of	Science,	Aquaculture Department,	2018 -

	alternatives to antimicrobials (researches, research-supporting policies, and alternative products) and implementation of those alternatives.	Technology and Environment Department, Department of Animal Health	Department of Animal Husbandry, research institutes, veterinary drug and animal feed companies	2020
22.	Evaluate the capacity of existing testing laboratories for carrying out tests for antimicrobial-resistant microorganisms.	Department of Animal Health	National Center for Veterinary Hygiene Inspection No. 1, National Centre for Veterinary Diagnosis	2017 - 2018
23.	Identify the leading laboratory and create a list of laboratories designated to carry out tests for antimicrobial-resistant bacteria.	Department of Animal Health	National Center for Veterinary Hygiene Inspection No. 1, related laboratories	2017 - 2018
24.	Create standards for antimicrobial-resistant bacteria test methods and organize training courses for the listed laboratories' staff.	Department of Animal Health	National Center for Veterinary Hygiene Inspection No. 1, National Centre for Veterinary Diagnosis, Science, Technology and Environment Department	2018-2020
25.	Carry out quality management activities for antimicrobial resistance tests in participating laboratories.	Department of Animal Health	FAO, testing laboratories on the list of participants	2018-2020
26.	Formulate a national surveillance program for antimicrobial resistance in food and animals	Department of Animal Health	FAO, National Center for Veterinary Hygiene Inspection No. 1	2017
27.	Implement the national surveillance program for antimicrobial resistance in food and animals	Department of Animal Health	National Center for Veterinary Hygiene Inspection No. 1, National Institute of Veterinary Research, related laboratories	2018-2020
28.	Formulate a national surveillance program of antimicrobial resistance in aquatic organisms and their derived products	Department of Animal Health	FAO, National Center for Veterinary Hygiene Inspection No. 1	2018
29.	Implement the AMR surveillance program on products derived from farmed aquatic organisms	Department of Animal Health	National Center for Veterinary Hygiene Inspection No. 1, National Agro-Forestry-Fisheries Quality Assurance	2019 - 2020

			Department, related laboratories	
30.	Create a central database in order to facilitate management and analysis of antimicrobial resistance data.	Department of Animal Health	National Center for Veterinary Hygiene Inspection No. 1, National Institute of Veterinary Research, related laboratories	2018-2020
31.	Create report forms, mechanisms for sharing the AMR surveillance program's results among participating laboratories and the concerned parties.	Department of Animal Health	National Center for Veterinary Hygiene Inspection No. 1, National Institute of Veterinary Research, related laboratories	2018
32.	Establish collaborative programs with research partners in order to continue studying and identify characteristics of antimicrobial-resistant bacteria in food and animals, with the private sector's involvement.	Department of Animal Health	Ministry of Health, FAO, OIE, WHO, OUCRU, CDC and other organizations	2017-2020
33.	Formulate and implement a national program for antimicrobial use management in animal husbandry and aquaculture.	Department of Animal Health	Department of Animal Husbandry, Directorate of Fisheries, veterinary drug, animal feed production and trade companies, National Institute of Veterinary Research, Research Institute for Aquaculture, universities	2018-2020
34.	Formulate collaborative programs with research partners to provide additional knowledge on antimicrobial use in animal husbandry and aquaculture.	Ministry of Agriculture and Rural Development	Department of Animal Health, Department of Animal Husbandry, universities and research institutes	2019-2020
35.	Quantify the effect of antimicrobial use and resistance management in animal husbandry and aquaculture and the occurrence of antimicrobial resistance in animal husbandry and aquaculture.	Department of Animal Health	International organizations, research institutes and universities	2019-2020
36.	Carry out regular surveillance of antimicrobial residue in animal-based food.	Department of Animal Health National Agro-	Department of Animal Husbandry, Directorate of Fisheries; provincial Animal Husbandry-Animal Health	Annually

		Forestry-Fisheries Quality Assurance Department	Branches, Agro-Forestry-Fisheries Quality Assurance Branches and Fisheries Branches	
37.	Share the surveillance program of antimicrobial residue's results.	Department of Animal Health, National Agro-Forestry-Fisheries Quality Assurance Department	Concerned parties, research institutes and universities	Annually
38.	Participate in the National Steering Committee for prevention of drug resistance's meetings.	Department of Animal Health	Ministry of Agriculture and Rural Development Ministry of Health Ministry of Industry and Trade) Ministry of Natural Resources and EnvironmentMinistry of Natural Resources and Environment	Annually
39.	Organize joint communication activities between health and veterinary medicine industries.	Department of Animal Health	Department of Animal Husbandry; National Agro-Forestry-Fisheries Quality Assurance Department; Aquaculture Department; Ministry of Health; Ministry of Industry and Trade; Ministry of Information and Communications; National Agricultural Extension Center	Annually
40.	Enhance the partnership between public and private sectors in order to raise awareness of antimicrobial resistance in animal husbandry and aquaculture through technical staff from related disciplines	Department of Animal Health	Associations; local governments; National Agricultural Extension Center	Annually
41.	Share information on antimicrobials, antimicrobial resistance and surveillance of residue among health, veterinary	Department of Animal Health, National Agro-Forestry-	Department of Food Safety, Ministry of Health's Medical Services Administration, Environment Administration	Annually

	medicine and environmental authorities.	Fisheries Quality Assurance Department	of Ministry of Natural Resources and Environment	
42.	Share antimicrobial use and resistance results in order to incorporate them into joint reports of the health and veterinary medicine authorities.	Department of Animal Health	Ministry of Health's Medical Services Administration, Environment Administration of Ministry of Natural Resources and Environment	Annually
43.	Participate in regional and global antimicrobial use and resistance management activities in animal husbandry and aquaculture.	Department of Animal Health	Department of Animal Husbandry, National Agro-Forestry-Fisheries Quality Assurance Department, Aquaculture Department, Science, Technology and Environment Department. International Cooperation Department	Annually
44.	Share data on antimicrobial use and resistance management in Vietnam among international partners.	Department of Animal Health	Research institutes, universities, Ministry of Health	Annually