

**Advisory Council on Food and Environmental Hygiene**

**Strategy and Action Plan on Antimicrobial Resistance related to Food**

**PURPOSE**

This paper briefs Members on the food-related initiatives under the Hong Kong Strategy and Action Plan on Antimicrobial Resistance (“AMR”) (2017-2022) (“Action Plan”).

**BACKGROUND**

2. The AMR problem is one of the emerging health issues across the globe. In recognition of the threat posed by AMR, the Government set up in 2016 a High Level Steering Committee on AMR (“HLSC”) chaired by the Secretary for Food and Health to formulate strategy and action plan to combat AMR. Taking into consideration the recommendations of an Expert Committee on AMR, set up under the HLSC and chaired by Prof. YUEN Kwok Yung, and having regard to the “One Health” framework which takes into account the aspects of human, animal and environment, a holistic Action Plan has been formulated by the HLSC and formally launched on 10 July 2017<sup>1</sup>.

3. The Action Plan has identified six key areas with an aim to slow the emergence of AMR and prevent its spread. Initiatives under 19 objectives in the six key areas are summarised in Annex. Those initiatives relating to food mainly concern the aspects of the local food animal production and AMR surveillance along the food supply chain in Hong Kong. They aim to contribute to the cross-sectoral efforts in combating the risks and challenges posed by the AMR problem to human health. Details are elaborated in the ensuing paragraphs.

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<sup>1</sup> The Action Plan is accessible at the website of the Centre for Health Protection ([www.chp.gov.hk/files/pdf/amr\\_action\\_plan\\_eng.pdf](http://www.chp.gov.hk/files/pdf/amr_action_plan_eng.pdf)).

## **CURRENT WORK IN REGULATING LOCAL FOOD ANIMAL PRODUCTION**

4. Hong Kong has a relatively small scale food animal farming sector, comprising 43 pig farms, 29 poultry farms and some 1 300 marine and freshwater fish farms. The total production of these farms accounts for around 2% of fresh livestock meat and around 1% of live and fresh fish consumed in Hong Kong. The rest are all imported from the Mainland and overseas.

5. All local pig and poultry farms are subject to licensing control in accordance with the Public Health (Animals and Birds) (Licensing of Livestock Keeping) Regulation (Cap. 139L). The Agriculture, Fisheries and Conservation Department (“AFCD”) conducts regular inspection of these farms to ensure their compliance with the licensing conditions and relevant regulations. Under the licensing conditions, poultry farms must implement the biosecurity plan and measures tailored for each farm in accordance with AFCD’s requirements which aim at minimising the risk of dissemination of infectious agents, including avian influenza virus. Advice on such general concepts of biosecurity is provided by AFCD to pig farmers as well during routine inspection.

6. Both AFCD and the Food and Environmental Hygiene Department (FEHD) enforce the Public Health (Animals and Birds) (Chemical Residues) Regulation (Cap. 139N) to regulate the feeding of drugs and chemicals to food animals. Under this Regulation, seven chemicals (including two antibiotics) are prohibited for use in food animals, whilst 37 chemicals (including 36 antibiotics) are allowed to be used, provided that their levels in meat and tissues must not exceed the specified maximum residue limits when the food animals are supplied for human consumption. This regulatory regime is mainly concerned with the proper usage of antibiotics and non-exceedance of residue levels for the purpose of safeguarding food safety, rather than addressing AMR issues.

7. Given the presence of infectious diseases in pigs and poultry which are endemic in the region, there is an inevitable need for farmers to use antibiotics for the control of such diseases. The World Organisation for Animal Health (OIE) acknowledges the responsible and prudent use of antibiotic medicines as essential to protect human and animal health as well as animal welfare<sup>2</sup>. In this connection, AFCD, by virtue of section 6(2) of the Antibiotics Ordinance (Cap. 137), issues written permits (“Antibiotics Permit”) to local pig and poultry farmers to enable them to purchase and

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<sup>2</sup> The OIE Strategy on AMR and the Prudent Use of Antimicrobials is accessible at [www.oie.int/fileadmin/Home/eng/Media\\_Center/docs/pdf/PortailAMR/EN\\_OIE-AMRstrategy.pdf](http://www.oie.int/fileadmin/Home/eng/Media_Center/docs/pdf/PortailAMR/EN_OIE-AMRstrategy.pdf).

possess antibiotics for treating diseases of their farm animals. The Antibiotics Permit covers 20 antibiotics that are commonly used in livestock farming and is valid for six months. Technical advice and education are provided by AFCD to pig and poultry farmers on the proper usage of antibiotics, the withdrawal period on drugs and the prohibition on the possession and use of prohibited chemicals. However, there are at present no specific requirements for farmers to keep comprehensive record of purchase and usage of antibiotics.

8. There is no legislation specifically governing the animal and public health aspects of local fish farms. Notwithstanding this, AFCD has implemented a number of administrative schemes under which regular farm visits are carried out to help fish farmers adopt good aquaculture practices and fish health management. Fish and feed samples are collected during the farm visits to monitor the food safety aspects including the use of antibiotics in cultured fish. Any irregularities will be investigated and followed up as appropriate.

## **INITIATIVES UNDER THE ACTION PLAN RELATED TO FOOD ANIMALS**

### *Develop surveillance programme on AMR microorganisms in food animals (Objective 1.3)*

9. Currently, there is lack of comprehensive information on the prevalence of AMR microorganisms in food animals and farm environments. As one of the objectives identified in the Action Plan, AFCD will commission a consultancy study to devise a plan for the surveillance on AMR microorganisms that are particularly pertinent to Hong Kong in food animal production farms. The study would include drawing up a list of AMR microorganisms to be monitored in local farms with reference to the latest “watch list” of AMR microorganisms in the region, and devising sampling and testing methodologies for assessing the prevalence and sources of AMR microorganisms in food animals and farm environment.

10. In parallel with the consultancy study, surveillance studies will be conducted by AFCD to ascertain if imported day-old chicks and breeding pigs are carriers of AMR microorganisms.

Monitor antimicrobial use in food animals (Objective 3.3)

11. According to the information so far gathered by AFCD, antimicrobials are only administered to food animals in local pig and poultry farms in case of disease outbreaks and in the very early stage of rearing when piglets and young chicks are generally subject to a higher risk of infection. As regards fish farming, the use of antimicrobials is not common as bacterial infection is not a major threat to aquaculture production in the local context.

12. At present, there is no sign of abuse of antimicrobials, such as using antimicrobials as a growth promoter in local livestock and fish farms. Nonetheless, as improper or widespread use of antimicrobials in food animal production is generally thought to be one of the factors leading to the AMR problem, the consultancy study mentioned in paragraph 9 above would also devise methodologies for estimating antimicrobial usage in local food animal production farms, sampling plan and testing methods for collecting the necessary data for making the estimation, and methodologies for detecting antimicrobials in wastes discharged from farms. In parallel with the study, AFCD will strengthen surveillance on antimicrobial usage in local food animals through requiring farmers to keep antimicrobial usage records in accordance with standardised templates, conducting surprise inspections at farms to check for antimicrobial stocks and usage, and collecting samples at farms to check for any abuse of antimicrobial usage.

13. Upon completion of the consultancy study and adoption of the monitoring plan devised by the consultants, AFCD will carry out systematic monitoring on antimicrobial usage in local food animal production farms. Standardised reporting formats and units, such as mg/kg of meat produced in food animals, will be adopted to facilitate comparison and trend monitoring of antimicrobial use.

Ensure proper use of antimicrobials in food animals (Objectives 7.1, 7.2, 7.3 and 12.1.5)

14. At present, the use of antimicrobials in food animals is often not supported by professional guidance. In the light of this, AFCD will facilitate the development and implementation of projects for the provision of veterinary services to food animal production farms by non-government veterinarians through engaging relevant local institutions, the veterinary sector and the farming sector. Apart from general veterinary services, the scope of the projects would include formulation of tailor-made farm-specific disease management plans for the purposes of preventing disease, managing disease spread, minimising the usage of antimicrobials, and

assisting farmers in sourcing vaccines and other relevant veterinary medications for disease prevention and management. AFCD will arrange training activities for non-government veterinarians to help build up their capacity for the provision of veterinary services to local food animal production farms.

15. Hitherto, as mentioned in paragraph 7, there are no specific requirements for farmers to keep comprehensive record of purchase and usage of antibiotics, rendering relevant enquiries and surveillance work difficult. In this regard, AFCD is in the process of conducting preliminary visits to local pig and poultry farms to inspect their antibiotic stock. A database has been developed for recording findings from the farm visits and analysing the types of antibiotics commonly used in local farms. AFCD will actively encourage farmers to properly record the sources, stock and usage of antimicrobials in order to facilitate future surveillance work. The data collected would be used to analyse the pattern of antimicrobial usage, including the quantities and types of antimicrobials used and the means by which they are administered. This will facilitate consideration on the eventual introduction of mandatory (or statutory) requirement on veterinary prescription of antibiotics for local food animal farms.

16. AFCD will implement the “veterinary prescription-only medication supply” policy at an appropriate juncture, as and when proper support and veterinary services are available to the local food animal production sector in respect of disease prevention and treatment in future. This will involve stopping the issuance of the Antibiotics Permit to farmers and inviting the Department of Health to review the relevant existing legislation on exemption of using antimicrobials in animal feeds, so that the use of antimicrobials in local food animals will be subject to veterinary prescription. In particular, the use of critically important antimicrobials in animal husbandry will be tightly regulated in accordance with prevailing international guidelines.

17. In addition, AFCD will develop guidelines and code of practice on the proper use of antimicrobials in accordance with prevailing international guidelines. Education and publicity programmes will also be organised for food animal farmers and veterinarians to promote the proper use of antimicrobials according to evidence and local epidemiology.

*Develop and strengthen infection prevention and control programmes in veterinary settings (Objectives 10.1, 10.2 and 10.3.1)*

18. Good farm management and biosecurity can contribute greatly to the reduction of susceptibility to infections and the need for antimicrobial use in animals, and thus it is recognised that there is a need to enhance the biosecurity measures and husbandry practices as well as management and control of food animal production farms. In view of this, AFCD will continue to provide regular education and training on farm management, biosecurity, and disease prevention and control to local food animal farmers and their workers, in addition to facilitating the provision of veterinary services to food animal production farms mentioned above.

19. In the long-term, based on the surveillance results on AMR in local food animal production farms pursuant to paragraphs 9 and 10 above, AFCD will commission a further consultancy study to assess the significance of food animal production sector in contributing to the AMR problem in Hong Kong, and accordingly formulate suitable measures to address the AMR issues associated with food animal production. AFCD may, where necessary, consider facilitating relocation and consolidation of livestock farms (without expanding the overall footprint and rearing capacities) in order to enable farmers to improve biosecurity of their farms.

## **INITIATIVES UNDER THE ATCION PLAN RELATED TO FOOD**

20. As set out in the Joint FAO/WHO Expert Committee on Food Additives (JECFA)'s Guidance document, a single exposure to residues of veterinary drugs is unlikely to provide the selective pressure necessary to change the susceptibility of the bacterial population within the microbiome (i.e. AMR). In addition, according to the Food Standards Australia New Zealand (FSANZ), it is highly unlikely that antibiotic residues in food would lead to resistance because residues are at very low level and are likely to be further reduced by cooking, other food processing and by metabolism in the gut. Moreover, there seems no sufficient evidence to affirm that chronic exposure to low dose of antimicrobial residues in food can significantly increase the development of resistant microorganisms in intestinal flora. The risk of intake of antimicrobial residues in food to the development of AMR is subject to further study and evaluation.

21. By and large, non-hygienic handling of raw/undercooked food may increase the risks of acquisition of bacteria (regardless of whether the bacteria are AMR or not) along the food chain, including from market to

kitchen/dining table. As such, food-related initiatives under the Action Plan ultimately point to the importance of proper and hygienic food handling, as elaborated in the following paragraphs.

*Develop AMR surveillance programme on food (Objective 1.4)*

22. The Centre for Food Safety (CFS) of FEHD has put in place a food surveillance programme (FSP) and collects about 65 000 food samples each year at the import, wholesale and retail levels. The FSP aims to ensure that food for sale in Hong Kong complies with relevant legal requirements and is fit for human consumption, rather than addressing the AMR issue or collating data for related purposes. As such, even if bacteria or pathogens (regardless of whether the bacteria/pathogens are AMR or non-AMR) are detected in non-ready-to-eat foods (such as meat or poultry) to have exceeded the levels under CFS's Microbiological Guidelines for Food, follow-up and enforcement actions are not warranted as the bacteria or pathogens would be removed by proper food processing or handling.

23. Although food-producing animals are considered reservoirs of pathogens with the potential to transfer resistance to humans, the magnitude of such transmission remains unknown in the international arena. To strengthen the knowledge on this, development of AMR surveillance programme on food forms part of the AMR surveillance system under One Health.

24. The Codex Alimentarius Commission of the Joint FAO/WHO Food Standards Programme (Codex) has been working on guidance on the design and implementation of an integrated surveillance on foodborne AMR along the food chain aiming to promote a harmonised approach for a better exchange and analysis among countries and areas. The guidance will cover the approaches and key components of an integrated surveillance system of AMR, including sampling sources, target microorganisms, sample design, laboratory testing and data management, as well as incorporation of information from integrated surveillance into risk analysis. The discussion on this project in Codex is expected to start in 2017 and the proposed guidance is expected to be adopted by Codex in 2020.

25. In parallel, CFS would conduct a pilot survey to gather the required local information to guide the development of a future surveillance system on food with reference to relevant advice and standards of pertinent international authorities such as Codex. In planning the proposed pilot survey, CFS has been working closely with the Centre for Health Protection (CHP) of the Department of Health to ensure the data

collected would meet the objective of the overall AMR surveillance structure coordinated by CHP and be integrated smoothly into the future centralised platform for AMR surveillance under One Health, to facilitate analysis of transmitting factors of AMR across sectors (Objective 1.5). CFS has initiated discussion with CHP on the proposed survey scope and design since June 2017. It is targeted to develop the survey protocol by 2018.

*Develop and implement targeted evidence-based health promotion programme for specific audience (Objectives 10.3.2 and 12.1.6)*

26. As stated by WHO, inappropriate food handling encourages the spread of AMR. Locally, the topic of AMR has been incorporated as one of the training components in hygiene supervisor training courses under the Hygiene Manager and Hygiene Supervisor Scheme of FEHD since 2017. Besides, CFS would step up its efforts in promoting the Five Keys to Food Safety primarily developed by WHO<sup>3</sup>, explaining the basic principles that each individual (including food handlers and consumers) should know and practice in order to prevent foodborne diseases, regardless of whether the pathogens are AMR or non-AMR.

27. There is a call for exploring the merits and feasibility of the labelling of pre-packaged “antibiotic-free” food items. There is currently no international consensus on the definition of “antibiotic-free” food. As in many jurisdictions, there is no AMR-related regulation on pre-packaged food labelling in Hong Kong. CFS would keep in view international development in this regard and local circumstances.

## **WAY FORWARD**

28. To take forward the Action Plan, the Government will continue to engage professionals, non-governmental organisations and other community stakeholders to seek their views and encourage participation. Relevant departments will continue to keep abreast of international and local development such that the Action Plan and its related work can be updated over time. New actions will be added as needed and existing actions may be modified or removed depending on progress or changes to the development of AMR problem. Mid-term and final reviews on all the

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<sup>3</sup> The Five Keys to Food Safety are: (1) Choose (choose safe raw materials), (2) Clean (keep hands and utensils clean), (3) Separate (separate raw and cooked food), (4) Cook (cook thoroughly), and (5) Safe temperature (keep food at a safe temperature).



actions proposed in the Action Plan will be conducted within a five-year period by the HLSC.

### **ADVICE SOUGHT**

29. Members are invited to note the launch of the AMR Action Plan and the initiatives related to food.

**Food and Health Bureau  
Agriculture, Fisheries and Conservation Department  
Centre for Food Safety, Food and Environmental Hygiene Department  
September 2017**

## Outline of Hong Kong Strategy and Action Plan on AMR

Key area 1: Strengthen knowledge through surveillance and research				
Objective 1 – Set up AMR surveillance system under One Health for Hong Kong				
Strategic interventions	Activities		Lead action party	Target(s) and Timeframe
1.1	Establish a coordination structure for One Health surveillance on AMR	1.1.1	Setup a “Working Group on AMR One Health Surveillance” to coordinate and plan on collection and dissemination of AMR/ antimicrobial use data	- DH - AFCD - CFS Commence by 2017
1.2	Strengthen AMR surveillance in healthcare settings	1.2.1	Harmonise AMR surveillance reporting criteria with reference to GLASS of WHO	- DH - HA Set criteria by 2017
		1.2.2	Develop surveillance at laboratory level for in- and out-patient service providers	- DH - HA Commence data collection from HA by 2018
1.3	Develop AMR surveillance programme in animals	1.3.1	Commission a consultancy study to devise a plan for the surveillance on AMR microorganisms in food animal production farms	- AFCD - DH Commission by 2018
		1.3.2	Conduct surveillance studies on AMR in imported day-old chicks and breeding pigs	- AFCD Commence by 2017
		1.3.3	Carry out surveillance on AMR in food animal production farms	- AFCD Commence by 2019
1.4	Develop AMR surveillance programme on food	1.4.1	Conduct pilot survey to guide development of a surveillance system in food	- CFS - DH Develop preliminary survey protocol by 2018
1.5	Set up a centralised platform for AMR surveillance data in human, animal, food and environment	1.5.1	Link data related to AMR surveillance and monitoring across different sector	- DH - AFCD - CFS Develop preliminary protocol by 2018
Objective 2 - Build laboratory capacity to support surveillance activities in both human and animal sectors				
2.1	Strengthen laboratory support in AMR surveillance	2.1.1	Identify Public Health Laboratory under DH as a local reference laboratory on AMR to advise the Administration and to support local medical laboratories	- DH On-going
2.2	Standardise laboratory antimicrobial susceptibility testing method for AMR surveillance	2.2.1	Promulgate adoption of international standards and guidelines for AST such as CLSI or EUCAST	- DH - HA Commence by 2018
2.3	Support establishment of quality assurance programme and promote introduction in medical laboratories	2.3.1	Coordinate with laboratories to conduct quality assurance programme for continuous improvement of standards of laboratories in Hong Kong	- DH Commence by 2018
Objective 3 - Monitor antimicrobial use in humans and animals				
3.1	Establish a coordination structure for antimicrobial use surveillance	3.1.1	Setup a “Working Group on AMR One Health Surveillance” to coordinate and plan on collection and dissemination of AMR/ antimicrobial use data	- DH - AFCD - CFS Commence by 2017
		3.1.2	Collect supply data on antibiotics from different sectors using standardised reporting formats	- DH - AFCD First report by 2017
3.2	Monitor antimicrobial use in humans	3.2.1	Collect antibiotic dispensary data from HA and monitor antibiotic use in public hospitals and clinics	- DH - HA First report by 2018
		3.2.2	Explore feasibility of using electronic Health Record (eHR) to capture prescription data from private sector	- DH - FHB Commence by 2017
3.3	Monitor antimicrobial use in animals	3.3.1	Commission a consultancy to devise a plan for monitoring antimicrobial usage in food animals production farms	- AFCD Commence by 2017
		3.3.2	Strengthen surveillance on antimicrobial use in local food animal production farms through interim measures such as imposing record keeping requirement and surprise inspection	- AFCD Commence by 2017
		3.3.3	Carry out systematic monitoring of antimicrobial use in food animal production farms	- AFCD Commence by 2019

## Key area 2: Optimise use of antimicrobials in humans and animals

### Objective 4 – Strengthen regulation on over-the-counter purchase of prescription-only antimicrobials

Strategic interventions	Activities	Lead action party	Target(s) and Timeframe
4.1 Enhance inspection against authorised sellers of poisons	4.1.1 Conduct special inspection against authorised sellers purchasing large volumes of antimicrobials	- DH	On-going
4.2 Enhanced test purchase of antibiotics against authorised sellers of poisons	4.2.1 Enhance test purchase	- DH	On-going
4.3 Review disciplinary actions against offences related to antimicrobials	4.3.1 Advise PPBHK to consider reviewing the disciplinary action on offences related to antimicrobials	- DH	Commence by 2017
4.4 Solicit support from licensed drug retailers	4.4.1 Refer to Strategic Intervention 13.1	- DH	On-going
4.5 Keep in view the necessity to amend relevant ordinances	4.5.1 Review the effect of strengthened measures against authorised sellers of poisons and review the necessity to amend relevant ordinances	- DH	As and when necessary

### Objective 5 - Implement and enhance training in prescribing antimicrobials through Antibiotic Stewardship Programme in human health sector

5.1 Ensure adequate resources for implementation and evaluation of ASP in healthcare settings	5.1.1 Assess resource implication for implementation of ASP	- DH - HA	On-going
5.2 Promote antibiotic prescription according to evidence-based guidelines for doctors and dentists	5.2.1 Continue to review and update the IMPACT guideline regularly for in-patient antibiotic stewardship and promulgate its use	- DH - HA	On-going
	5.2.2 Continue ASP in public hospitals	- DH - HA	On-going
	5.2.3 Advocate ASP in private hospitals	- DH - Private hospitals	On-going
	5.2.4 Formulate and promulgate evidence-based guidelines in primary care setting	- DH - HA - Professional bodies	Produce guideline by 2018

### Objective 6 - Monitor compliance with antibiotic prescription guidelines of human health practitioners

6.1 Monitor compliance with antibiotic prescription guidelines of human health practitioners	6.1.1 Encourage evaluation and audit of ASP and establish feedback loop to reflect performance	- DH - HA	On-going
	6.1.2 Conduct surveys to gauge knowledge, understanding and prescription behaviour of human health practitioners	- DH	Commission in 2017 to 2019

### Objective 7 - Ensure proper use of antimicrobials in animals

7.1 Strengthen support to food animal production and veterinary sectors	7.1.1 Facilitate and support development of projects for the provision of veterinary services to food animal production farms by non-government veterinary sector	- AFCD	Commence by 2017
	7.1.2 Formulate tailor-made farm-specific disease management plans	- AFCD	Commence by 2018
	7.1.3 Assist farmers in sourcing vaccines and veterinary medications for disease prevention and management	- AFCD	Commence by 2018
	7.1.4 Arrange training activities for non-government veterinarians to build up their capacity for providing veterinary services to local food animal production farms	- AFCD	Commence by 2018
7.2 Promote proper antimicrobial use according to evidence and local epidemiology	7.2.1 Develop guidelines and code of practice on the proper use of antimicrobials and use of critically important antimicrobials in animal disease management in accordance with prevailing international guidelines	- AFCD	Commence by 2018
	7.2.2 Organise education and publicity programmes for food animal farmers and veterinarians on the proper use of antimicrobials	- AFCD	On-going
7.3 Enhance regulation of antimicrobial use in food animals	7.3.1 Implement “veterinary prescription-only medication supply” policy and tightly regulate the use of critically important antimicrobials in animal husbandry	- AFCD	Commence by 2019
	7.3.2 Review relevant legislation on exemption of using antimicrobials in animal feeds	- AFCD - DH	Commence by 2017

### Key area 3: Reduce incidence of infection through effective sanitation, hygiene and preventive measures

#### Objective 8 - Strengthen infection prevention and control measures in healthcare settings

Strategic interventions		Activities		Lead action party	Target(s) and Timeframe
8.1	Secure resources for implementing infection control programmes in hospitals	8.1.1	Assess resource implication for implementation of the infection control programmes	- DH - HA	On-going
8.2	Enhance infection control infrastructure in hospitals	8.2.1	Review ward design according to international guidelines and recommendations in planning new hospitals	- DH - HA	On-going
8.3	Promote hand hygiene in healthcare settings	8.3.1	Review and strengthen hand hygiene programmes to improve compliance by healthcare workers	- DH - HA	On-going

#### Objective 9 - Strengthen infection control training for healthcare workers

9.1	Strengthen infection control training among healthcare workers	9.1.1	Continue to provide infection control training with refresher information to new intakes of healthcare workers	- DH - HA	On-going
		9.1.2	Raise awareness and solicit healthcare workers' support to patient engagement programme on reminding healthcare workers to perform hand hygiene	- DH - HA	Engage healthcare workers by 2018 Pilot by 2019

#### Objective 10 - Develop and strengthen infection prevention and control programmes in veterinary settings and along food supply chain

10.1	Develop infection prevention and control policies and strategies	10.1.1	Devise tailor-made farm-specific disease management plan for the purpose of disease prevention, management of disease spread and minimise the usage of antibiotics	- AFCD	Commence by 2018
		10.1.2	Consider relocation and consolidation of livestock farms if necessary	- AFCD	As and when necessary
10.2	Identify risk and potential control points for AMR containment along food supply chain	10.2.1	Commission a consultancy to assess the significance of food animal production in contributing to AMR and formulate suitable measures to address the AMR issues associated with food animal production	- AFCD	Commence by 2020
		10.2.2	Review overseas studies to identify potential control points to contain AMR	- AFCD - CFS - FEHD	Commence by 2018
10.3	Strengthen infection control training and education for workers along food supply chain	10.3.1	Provide regular education seminars on biosecurity, disease control and prevention and farm management to farmers and their workers	- AFCD	On-going
		10.3.2	Include AMR in training courses under the Hygiene Manager and Supervisor Scheme	- FEHD	On-going

#### Objective 11 - Enhance vaccination uptake

11.1	Promote vaccinations contributing to prevention of antimicrobial resistant infections	11.1.1	Encourage uptake of seasonal influenza and pneumococcal vaccine	- DH - HA	On-going
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## Key area 4: Improve awareness and understanding of antimicrobial resistance through effective communication, education and training

### Objective 12 - Raise awareness of AMR among general public, students and target population

Strategic interventions	Activities	Lead action party	Target(s) and Timeframe
12.1 Develop and implement targeted evidence-based health promotion programme for specific audience including students and personnel working in healthcare, animal health, food animal production and food hygiene settings	12.1.1 Monitor Knowledge, attitude and practice (KAP) towards AMR and antimicrobial use among general public and target population by survey	- DH - AFCD - CFS	Commission in 2017 to 2019
	12.1.2 Develop and review key messages to raise public awareness and call for action based on KAP results	- DH - AFCD - CFS	On-going
	12.1.3 Support and participate in annual Antibiotic Awareness campaign and Hand Hygiene Day	- DH	On-going
	12.1.4 Develop and disseminate information on AMR and related topics through existing health promotion channels, healthcare service providers and platforms commonly used by target populations including patients, food animal farmers, private veterinarians and food business operators	- DH - AFCD - CFS - FEHD	On-going
	12.1.5 Provide regular education and training to food animal farmers on antimicrobial use and measures on control of veterinary products	- AFCD	On-going
	12.1.6 Explore the merits and feasibility of labelling of pre-packed antibiotic-free food	- CFS	On-going
12.2 Include AMR and related topics to students	12.2.1 Review high school liberal studies curriculum in relation to AMR	- DH	Commence by 2017
	12.2.2 Develop education materials on AMR and related topics for primary students	- DH	Training of staff in 2017 to 2018, Pilot in 2018. Commence by 2019 with on-going evaluation

### Objective 13 - Engage patients in adopting infection control measures and proper use of antibiotics

13.1 Strengthen health information provision at point-of-care	13.1.1 Develop and provide health education materials in hospital wards, clinics and pharmacies	- DH - HA	On-going
	13.1.2 Develop and advocate provision of health information on personal hygiene measures on antibiotic drug prescription bags	- DH - HA	On-going
	13.1.3 Educate patients to use antibiotic appropriately	- DH - HA	Produce guideline for primary care by 2018. Health promotion commence by 2019
13.2 Provide supportive environment to facilitate hand hygiene practices by patients	13.2.1 Continue to provide accessible hand hygiene facilities and products in healthcare settings	- DH - HA	On-going

### Objective 14 - Include AMR and related topics in school curricula and continuous training of human health and veterinary professionals

14.1 Include prescribing competencies and infection control practices as core component of professional education and continuous development	14.1.1 Include AMR and related topics in undergraduate curricula for human health and animal health professionals and encourage continuous professional development	- DH - AFCD - Academia	On-going
14.2 Strengthen infection control training for healthcare workers, veterinarians and workers along food supply chain	14.2.1 Refer to Objectives 9 and 10	- DH - HA - AFCD - CFS - FEHD	

**Key area 5: Promote research on AMR**

**Objective 15 – Promote research on innovative technology and medical science**

Strategic interventions		Lead action party	Target(s) and Timeframe
15.1	Promote development of novel diagnostics tools to aid diagnosis and treatment of infections and AMR	- DH - Academia	Promote source of funding to stakeholders starting in 2017
15.2	Promote development of novel preventive measures on AMR		
15.3	Promote development of novel antimicrobials or other alternative agents		

**Objective 16 – Promote research on behavioural science and psychology**

16.1	Promote research on awareness and education regarding AMR, infection prevention and control, and antibiotic stewardship	- DH - Academia	Promote source of funding to stakeholders starting in 2017
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**Objective 17 – Promote research on health and economic burden**

17.1	Promote research in estimating local health burden of AMR	- DH - Academia	Promote source of funding to stakeholders starting in 2017
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**Key area 6: Strengthen partnerships and foster engagement of relevant stakeholders**

**Objective 18 – Strengthen international partnerships and regional collaboration**

Strategic interventions	Activities	Lead action party	Target(s) and Timeframe		
18.1	Continue participating in international, regional and country initiatives in implementing the Action Plan on AMR	18.1.1	Host a regional symposium on AMR	- DH - AFCD - CFS - FEHD	Organise symposium by 2018

**Objective 19 – Inform public policy and facilitate stakeholder engagement**

19.1	Inform public policy and facilitate stakeholder engagement	19.1.1	Organise information sharing session(s) for different stakeholders and target audience	- DH - AFCD - CFS - FEHD	Commence by 2017
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