

## National Report on Antimicrobial Agents Intended for Use in Animals

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**FEDERAL MINISTRY OF  
LIVESTOCK DEVELOPMENT**



**Federal Government of Nigeria 2025**

## FORWARD

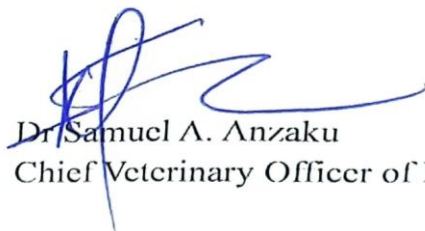
Antimicrobial resistance (AMR) has emerged as a significant global health concern, profoundly impacting human and animal health, agriculture, environment and economic stability. The consequences of AMR are far-reaching, resulting in increased morbidity and mortality due to treatment failures, loss of effective treatment options, and the heightened severity of infectious diseases. The implications of AMR extend beyond health, threatening the sustainability of food systems and economic development.

One of the drivers of antimicrobial resistance is the misuse of antimicrobials. Therefore, establishing a system of monitoring antimicrobial use (AMU) is essential in controlling AMR. The World Organization for Animal Health (WOAH) developed a database for monitoring global AMU and Nigeria, being a member country routinely submits data to the WOAH AMU database (ANIMUSE).

A robust surveillance system enables the monitoring of antimicrobials used in animals, providing evidence-based insights that inform regulation, advocacy, and targeted interventions.

This national report on antimicrobial use monitoring in Nigeria provides insight on the amount of antimicrobial agents imported for use in animals between 2018 and 2023. The data is based on the list of registered antimicrobial agents imported into the country through the National Agency for Drug Administration and Control (NAFDAC). The data is sorted into the different classes, animal species and routes of administration. The active ingredient of each product is then converted into kilograms, which when divided by the number of animal species results in the biomass.

This report is aimed at providing information to various stakeholders including policy makers, animal health practitioners and livestock farmers, which would inform critical decision on prudent use of antimicrobials and stewardship in the animal health sector.



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## **Acknowledgement**

The Government of Nigeria appreciates the technical expertise and guidance of the World Organization for Animal Health (WOAH) for initiating the process of writing this report.

Special thanks goes to the management and team of the National Agency for Food and Drug Administration and Control (NAFDAC) for providing the raw data from the list of registered antimicrobial agents in the country and the management and team of the Federal Ministry of Livestock Development for analysing the data and subsequent submission to the WOAH ANIMUSE reporting platform.

## **I. INTRODUCTION AND CONTEXT**

### **A. Background**

Antimicrobials, encompassing antibiotics, antivirals, antifungals, and anti-parasitics have played an instrumental role in managing infectious diseases across both human and Veterinary medicine. These compounds have significantly reduced morbidity and mortality rates, improved public health outcomes, and enhanced agricultural productivity by ensuring healthy livestock and poultry production.

In Nigeria, the use of antimicrobials in the animal health sector is a common practice, driven by the need to maintain the health and productivity of livestock, poultry, and aquaculture. The country's agricultural sector, which accounts for a significant portion of the economy, relies heavily on these drugs to prevent, and control infectious diseases, particularly in regions where livestock farming is intensive. According to the National Bureau of Statistics (NBS, 2020), agriculture contributes about 21% to Nigeria's GDP, with livestock and poultry farming being major components. However, this reliance on antimicrobials is not without consequences.

The inappropriate and indiscriminate use of antimicrobials in Nigeria has contributed to the emergence of AMR, with reports indicating a growing resistance among pathogens that affect both animals and humans.

To curb the menace of AMR, Nigeria developed a strategy for antimicrobial resistance for both active and passive surveillance. The country also developed a strategy for antimicrobial use surveillance to facilitate AMU data collection not only at the import level but at the sales and farms/clinic levels.

The country has also developed a policy on AMR and AMU. This policy highlights critical challenges facing the animal health sector with regards to the misuse of antimicrobials and activities to help mitigate the challenges. In addition to the AMR and AMU policy are regulatory framework for the importation, manufacture, distribution and sale of antimicrobials intended for use in animals.

It is therefore important to evaluate the amount of antimicrobial agents imported for use in animals in Nigeria. This will provide insight on the types of antimicrobials used and monitor the trend over time, which will point out areas of intervention for responsible and prudent use of these products.

### **B. Target Audience**

This report covers information on antimicrobial agents imported between 2018 to 2023. The target audience for this report are policy makers, animal health practitioners and livestock farmers. The policy makers can help come up with regulatory directives that would ensure responsible use of authorised veterinary medicinal products.

The animal health practitioners will ensure prudent and responsible use of antimicrobials and stewardship.

The farmers are the end users of antimicrobials and through good production practices, good vaccination and alternatives, they are able to reduce the use of antimicrobials, hence preserving them for use in both human and animal health.

### **C. PURPOSE AND OBJECTIVE(S)**

#### **1. Purpose**

Monitoring antimicrobial consumption in animals provides evidence on the amount used in the sector on an annual basis and gives information on the type of antimicrobials used in different animal species. The information generated from this report will support national and subnational efforts in combatting antimicrobial resistance. The aim of this report is to ensure antimicrobial stewardship through prudent and responsible use of these products. This will ultimately mitigate AMR not only in the animal health sector, but also preserve critically important antimicrobials in human health.

Access to relevant data on AMC/U will inform policy decisions, such as the revision of national treatment guidelines and development of regulatory directives especially as it pertains to the use of critically important antimicrobials. It will also help identify priorities for advocacy to policy makers and development of regulatory directives. It will support awareness creation and sensitization for farmers and encourage behavioural change among farmers on good animal husbandry practices as alternative to antimicrobials. The report will also serve as a guidance document to animal health practitioners and promote responsible use.

The data for this report was generated from the national import data of registered antimicrobials from the National Agency for Food and Drug Administration and Control (NAFDAC). The analysis was done using the World Organization for Animal Health (WOAH) global database for antimicrobial use (ANIMUSE).

#### **2. Objectives**

- Assessment of antimicrobials imported for use in animals between 2018 to 2023
- Detection of critically important antimicrobials for human and animal health
- Evaluation of antimicrobial consumption relative to biomass
- Recommendations for the control of AMR through prudent use of antimicrobials.

## **II. METHODOLOGY**

Antimicrobial agents imported into the country for use in humans and animals are registered at the point of entry by the regulatory authorities every year. The registered products are sorted by the National Agency for Food and Drugs Administration and Control (NAFDAC) officials into human health and animal health products. The raw data on animal health products are then shared with the Chief Veterinary Officer of Nigeria who is also the WOAH Delegate at the Federal Ministry

of Agriculture and Food Security (FMAFS) during quarter four of each year. The Focal Point for veterinary medicinal products (VMPs) sorts the data into different classes of antimicrobials, animal species in which products are used and the routes of administration of each product. The sorted data is then imputed into the antimicrobial use database (ANIMUse) where it is first validated by the WOAHS team and then analysed automatically.

Continuous surveillance is conducted at the port of entry by the Port Inspection Directorate. Inspections are conducted to monitor the utilization of veterinary antibiotics and other antimicrobial agents imported into the country. The use of cutting edged technologies such as TRUSCAN and Mobile Authentication Service (MAS) are employed for detection of substandard antibiotics at ports and for post market surveillance.

## A. Data Sources

The National Agency for Food and Drugs Administration and Control (NAFDAC) register all products, collate data on AMU in animal health, and share it with the Chief Veterinary Officer of Nigeria at Federal Ministry of Agriculture and Food Security (FMAFS) who is the WOAHA Delegate. In addition, the Focal Point for Veterinary Medicinal Products analyses and submits the data to WOAHA using the ANIMUSE Platform. Reports for 2014 to 2017 were prepared using the (Veterinary Medicinal Products) VMD format and shared with relevant authorities. Annual data is collected from 1<sup>st</sup> January to 31<sup>st</sup> December every year. The office of the Chief Veterinary Officer of Nigeria CVON request for the raw data from NAFDAC by the 4th quarter of every year and analyze it for submission to WOAHA.

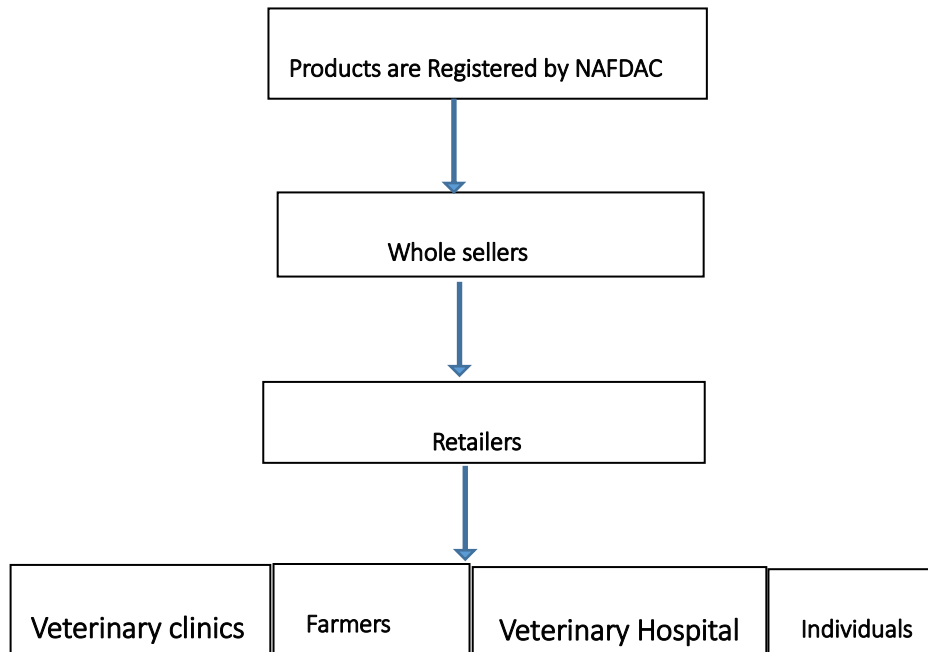


**Figure I: Flow chart on how antimicrobial products imported and produced locally in the country are distributed.**

## **B. Animal Population, Production and Biomass**

Nigeria is a Federation of 36 states and the Federal Capital Territory (FCT). Each state is sub-divided into local government areas (LGAs). There are 774 local governments in Nigeria.

Livestock production is critical to livelihoods and the economy of the country. Around 13 million households keep farm animals, and the sector contributes 6 to 8 percent of the national GDP despite the low level of development of commercial livestock production.

Cattle milk production amounts to 585 000 tons of milk per year, that only covers 40 percent of the demand in Nigeria. The remaining proportion of the demand for dairy products is estimated at about 1.3 billion tons of milk per annum (ASL2050, 2018). With a rapidly growing population and a potential regional export market, dairy production in Nigeria is bound to increase. The current national cattle population estimated at 20 million heads (FAOSTAT, 2018) with milk being produced by pastoral, agropastoral and commercial production system. The net volume of milk produced nationally must be grown steadily using innovative methods in order to meet the growing demand.

Small ruminant livestock also share a similar sectoral distribution as cattle with near absence of large commercial production in Nigeria. Commercial goat dairying is yet to gain acceptance among farmers. Pig production in Nigeria is a more limited and isolated activity, despite its rapid growth, pig production in Nigeria has not bloomed into popular commercial enterprises. However, there is a steady growth in number of small holder producers and free-range rearing, where pigs serve to protect livelihoods of poor families.

More than 80 percent of Nigeria's total domestic production of fish is generated by artisanal small-scale fisheries in the coastal, inshore, creeks of the Niger Delta, lagoons, inland rivers and lakes. From 21 700 tons in 1999, aquaculture production has grown steadily to 316 700 tons in 2015 according to the government report. Catfish, typically grown in ponds and tanks, is the most farmed species in Nigeria, constituting over half of the total aquaculture production by volume. The estimated annual *per caput* fish consumption was put at 13.3 kg in 2013. The total fisheries production was estimated at 1,027,000 tons in 2015 with 36 percent obtained from marine catches, inland waters catches contributed 33 percent and aquaculture 31 percent. Overall, the fisheries sector contributed 0.5 percent of national GDP in 2015 (FAO, 2024). These growth projections in animal production could be jeopardised by AMR.

**Table 1: The estimated livestock population in Nigeria as at 2022 (Data Source: Department of Animal Husbandry Services, Federal Ministry of Agriculture and Food Security)**

| <b>Livestock Species</b> | <b>Livestock population estimate 2022</b> |
|--------------------------|-------------------------------------------|
| <b>Cattle</b>            | 58,776,242                                |
| <b>Sheep</b>             | 60,284,445                                |
| <b>Goat</b>              | 108,755,793                               |

|                    |             |
|--------------------|-------------|
| <b>Pig</b>         | 16,648,471  |
| <b>Rabbit</b>      | 11,189,599  |
| <b>Donkey</b>      | 1,634,437   |
| <b>Camel</b>       | 356,233     |
| <b>Horse</b>       | 190,505     |
| <b>Chicken</b>     | 562,393,171 |
| <b>Guinea fowl</b> | 78,420,883  |
| <b>Duck</b>        | 43,691,455  |
| <b>Turkey</b>      | 5,017,608   |
| <b>Pigeon</b>      | 5,800,260   |
| <b>Geese</b>       | 216,259     |
| <b>Ostrich</b>     | 5,370       |
| <b>Total</b>       | 953,380,731 |

## **B. Livestock production system in Nigeria**

There are three systems of livestock production in Nigeria namely:

Extensive management system, where animals are allowed to roam around in search of feed or fodder eg ruminants, local poultry, pigs.

Intensive management system: where animals are housed and provided with feed and water eg commercial poultry, fish, pigs and some cattle farms

Semi intensive management system: where animals are allowed to go out usually in the mornings in search of feed/fodder and return to their shelters in the evenings eg backyard pigs and ruminants production.

### **C. Animal Health Situation**

Nigeria experiences a significant burden of animal diseases, including zoonotic infections, transboundary animal diseases, and emerging viral diseases. Anthrax, brucellosis, bovine tuberculosis, and highly pathogenic avian influenza are priority zoonotic diseases, while Peste des Petits Ruminants (PPR) and African Swine Fever (ASF) are major transboundary threats. Emerging arboviral diseases, like those transmitted by arthropods, also pose a risk, especially during the rainy season. Other bacterial diseases or infections that may affect antimicrobial use are Salmonella, Colibacillosis, Haemorrhagic Septicaemia, Bovine Tuberculosis, Leptospirosis, Strangles etc. Some of these diseases can be controlled through effective vaccination which will reduce the need for antimicrobials.

National vaccination programs are implemented to control diseases like rabies, CBPP, NCD, PPR and anthrax. The vaccination boosts immunity and prevents secondary bacterial infections. Strengthening veterinary services and infrastructure is therefore crucial for disease prevention and control. Raising awareness among the public about zoonotic diseases and preventive measures is equally essential. There is also the need for routine surveillance for zoonotic and transboundary diseases to ensure early detection and outbreak control. Other measures include early diagnosis and treatment of infected animals to prevent the spread of diseases and improved hygiene and sanitation practices can help reduce the risk of zoonotic infections.

### **D. Regulatory Framework**

#### **Animal Disease Control Act 2022 (As amended)**

The Animal Disease Control Act 2022 (as amended) provides for the control and prevention of animal diseases, with the objective of preventing the introduction and spread of infectious and contagious diseases among animals, hatcheries and poultry farms in Nigeria. The law empowers the Minister of Agriculture to regulate the use and administration of veterinary medicinal products in veterinary clinics, livestock, aquaculture and poultry farms and in wildlife. Section 40, subsections a - g, empowers the Minister of Agriculture to regulate veterinary biologics, veterinary medicinal products as well as ensure surveillance of antimicrobial use and antimicrobial residues in animal food products. Therefore, the law also provides for access and use of antimicrobial drugs in animals and the control of antimicrobial resistance and that of residues in animal food products.

The Federal Department of Veterinary and Pest Control Services (FDVPCS) has also produced Guidelines for Use of Antimicrobials in Animal Health in Nigeria, There are also other National Action plans and disease control policy documents including the plans for control of CBPP, FMD, Anthrax and Brucellosis which give recommendations of antimicrobial use or otherwise in animal diseases control in Nigeria.

## **Policy Plan and Regulation of Antimicrobial Resistance and Antimicrobial Use in Nigeria**

The policy highlights all the major challenges of misuse of antimicrobials and activities to address them. An important recommendation is the development of a regulation to ban of use of antimicrobials as growth promoters.

### **Veterinary Surgeons Act 2016 (as amended)**

The Veterinary Surgeons Act (2016), provides for the training and registration of Veterinary Surgeons and for matters connected to their practice and discipline. The law maintains standards of veterinary education and practice. It enables the Veterinary Council of Nigeria register and monitor the conduct of veterinarians and veterinary paraprofessionals in Nigeria and where necessary institute measures of sanction against practitioners in cases of unethical conduct.

**Good Manufacturing Practice for Medicinal Products Regulations, 2021** prescribe the minimum good manufacturing practice requirements for processing, packaging or handling of a pharmaceutical product for human or animal use, in order to ensure that the product meets safety requirements, and quality and purity characteristic requested

**Good Distribution Practice for Pharmaceutical Products Regulations, 2021**The Regulations apply to individuals involved in goods distribution and governments at each level, public and private health institutions, importers, exporters, transporters, distributors and wholesalers of pharmaceutical goods. Matters covered by the Regulations concern: authorization to distribute the products; inspection; documentation and record keeping; storage and transport conditions; shipment containers and container labelling; quarantine conditions; offences and penalties; interpretation of relevant terms. But this is lacking the area of use of the products

**Drugs and Related Products (Registration) Regulations, 2021** make provision for the registration of drugs No drug product shall be manufactured, imported, exported, advertised, sold, distributed or used in Nigeria unless it has been registered in accordance with the provisions of these Regulations

Other related policies and regulations are listed below:

- National Animal Health Policy 2022
- Breeder Farms , Hatcheries and Animal Feed Establishment (Infectious Diseases and other Health Hazards Prevention) Regulation 2021
- Food and Drug Act Cap F 32 LFN 2004
- Counterfeit and Fake Drugs and Unwholesome Processed Foods (miscellaneous provisions) Act, Cap C 34 LFN 2004
- Drug and Related Product Labelling Regulations 2021
- Drug and Related Products Advertisement Regulations, 2021
- Regulatory Directives (RD) (NAFDAC)
- Ban on the placement of branded medicated feed in the open market
- Ban on the use of Antibiotics as growth promoters in livestock and fish production
- Ban on the use of Antibiotics and Gentian violet as mold inhibitors in animal feed

- Ban on the use of some veterinary drugs in food-producing animals such as Carbadox, Nitrofurazone, olaquindox, stilbens etc
- Enforcement of the review of the formulation of veterinary antibiotics to prevent the excessive use of multiple Active Pharmaceutical Ingredients (APIs)
- Ban on the use of colistin (coccidiostat) as additive in animal feed

#### **E. Social Behaviours on Antibiotic Use in the Field**

Socio-cultural activities significantly influenced antimicrobial misuse in livestock. In a study on pastoralists (Alhaji and Ishola, 2018) found that only 8.1% of the pastoralists knew that giving an under-dose of an antimicrobial medication constitute misuse. While up to 58% of pastoralists reported self-prescription of antimicrobials in animals

Mortality in day old chicks is a big concern for farmers that have experienced early chick death due to infection from the hatcheries or transport stress, therefore resort to use of antibiotics. Ndahi et al. (2023) reported that 98% of commercial poultry farmers surveyed in Plateau and Oyo States administer prophylactic treatment to day old chicks. The problem is nation-wide, a study in north-western Nigeria (Alhaji et al., 2018) reported that about 48% of commercial poultry farmers and 93% of local free range poultry keepers arbitrarily determined antimicrobial dosage before administration. Even though over 92% of the local poultry keepers reported that they do not use antimicrobials, the intensity of use is most in commercial poultry rearing.

Use of antibiotics for growth promotion is also common, particularly in fattening programs of bulls, bucks, and rams. The availability of long-acting preparations that have depot-effect has enabled users to rely less on qualified veterinary services due to the lesser requirement for repeated dosing. Many oral antimicrobials are used in the management of infections in small ruminants including human preparations of sulphonamides, tetracyclines, aminoglycosides and other forms of antibiotic preparations that were not intended for use in ruminants. This scenario may create opportunity for emergence of resistant pathogenic and commensal bacteria. High levels of resistance among zoonotic enteric pathogens have been noted in livestock species. Similar concerns about high levels of resistance among fish bacterial pathogens have been reported due to misuse of antibiotics to control infections in aquaculture (Elmahdi *et al.*, 2016). This evidence emphasizes the need for sustained antimicrobial use (AMU) control and AMR surveillance in important livestock and fish species particularly those that are most important in the human food supply.

Marketing and use of unauthorized medication is also common. In a survey of antimicrobials in the market in Nigeria indicated some products contained cocktail of antibiotics, having up to six different classes with very high concentration of active ingredients which are not in the list of registered antimicrobials reported to WOAHA (Ndahi et al, 2023). Meanwhile the NAFDAC has banned the importation and sale of preparations containing cocktails of antibiotics in Nigeria. Earlier reports such as Ojo et al., (2016) reported that antimicrobial agents were widely distributed, readily accessible and commonly used in animal production. Fluoroquinolones and other critically important antimicrobials for human medicine were widely used in animals as prophylactics. This practice is promoting non-adherence to hygienic principles and management laxity in farm

operations. This is also consistent with findings on pig farms (Adebowale et al., 2020) that indicated that the most commonly used antibiotics on pig farms as tetracycline (78.8%), gentamicin (53.8%), and tylosin (52.5%). Perceived drivers of AMU in pigs were linked to economic benefits, farmers' previous experiences, sick animals, expensive veterinary services, easy accessibility to over-the-counter drugs, poor farm practices, and poor disease prevention strategies.

A large cross sectional study (Njoga et al., 2021) established that Critically important antimicrobials, belonging to the WHO's lists of 'Highest' and 'High' priority antibiotics, were administered sub-therapeutically for prophylaxis and growth enhancement purposes. Many diseases that warranted the antimicrobial administration were of viral etiology. Only 64.2% of the farmers administered the drug based on veterinarians' prescription. Trained professionals are also major contributors to poor drug use practices. A survey of veterinarians and para-veterinarians on antibiotic use practices revealed that almost all 390 respondents (98.5%) recommended the use of antibiotics to treat animal patients with majority (82.6%) reportedly recommended oxytetracycline, tylosin and gentamicin were recommended by 44.5% and 43.5% respectively (Oguche et al., 2021). A third (32.0%) of recommendations were empirical without prior antimicrobial susceptibility testing (AST). Smith et al. (2023) also found that 64.5% of veterinarians do not do culture and sensitivity before antibiotic prescription. At least 60% of the animal health workers recommended the use of antibiotics for the treatment of non-bacterial pathogens, including viral, helminth and fungal pathogens. Over 55% (217/390) were not aware of government-issued guidelines on antibiotic use in animals (Oguche et al., 2021).

### **III. AMU DATA COLLECTION SYSTEM**

#### **A. Monitoring System for Antimicrobial Consumption Data in Nigeria**

Antimicrobial agents intended for use in animals in Nigeria are registered by the regulatory authority (NAFDAC). This includes the list of registered products and the quantities of antibiotics imported. The raw data is shared with the office of the Chief Veterinary Officer of Nigeria (CVON) and the AMR Focal Point works with the team in the Department of Veterinary Public Health and Epidemiology to sort, clean and analyze the data for submission into the WOA database. The data once submitted into the WOA database undergoes a validation process. The reports for 2014 to 2017 was developed by the then Federal Ministry of Agriculture and Rural Development (Now Federal Ministry of Livestock Development) and shared with relevant stakeholders including NAFDAC.

Although there is no legislation that mandates NADFAC to share data with the Federal Ministry of Livestock Development (FMLD), the fact that both NAFDAC and FMLD are Government establishments allows for data sharing between the two MDAs. However, discussions are ongoing to develop a memorandum of understanding between the two MDAs.

Data on antimicrobial agents are expected to reach the office of the CVON by the last quarter of every year. The data is then analysed and reported by the last month of the year.

## B. Data on Antimicrobial agents intended for use in animals

Based on the data generated over the years, the classes imported include tetracyclines, penicilins, macrolides, sulphonamides, aminoglycosides, polymyxins and fluoroquinolones. The amount of tetracyclines imported have been the highest throughout the period of reporting, followed by fluoroquinolones and macrolides respectively. There seemed to be an increase in the amount of fluoroquinolones in 2021 and 2022. This class of antimicrobial is a critically important antimicrobial in humans, hence the need to reduce the use in the animal health sector. Most of the products imported were for use in terrestrial animal species. Only fluoroquinolones have labels for aquatic animals. Also, with regards to the route of administration, most products were for oral administration as compared to injection.

**Table 2.** Antimicrobial classes and active ingredients approved for use in animals in 2018 to 2022

| Antimicrobial agents imported for use in animals | Active Ingredients            | Categorisation of veterinary important antimicrobial agents authorised for use in animals   |      |     |
|--------------------------------------------------|-------------------------------|---------------------------------------------------------------------------------------------|------|-----|
|                                                  |                               | VCIA                                                                                        | VHIA | VIA |
| Tetracyclin                                      | Oxytetracycline               | X                                                                                           |      |     |
|                                                  | Oxytetracycline Hydrochloride |                                                                                             |      |     |
|                                                  | Doxycycline                   |                                                                                             |      |     |
|                                                  | Doxycycline hyclate           |                                                                                             |      |     |
| Penicillin                                       | Amoxicillin                   | X                                                                                           |      |     |
|                                                  | Penicillin                    |                                                                                             |      |     |
|                                                  | Penicillin G                  |                                                                                             |      |     |
|                                                  | Procaine penicillin           |                                                                                             |      |     |
| Polymyxins                                       | Colistin                      | Colistin is classified as a HPCIA for human health and subject to specific recommendations. |      |     |
|                                                  | Colistin Sulphate             |                                                                                             |      |     |
| Fluoroquinolone                                  | Enrofloxacin                  | X                                                                                           |      |     |
|                                                  | Ciprofloxacin                 |                                                                                             |      |     |
|                                                  | Norfloxacin                   |                                                                                             |      |     |
| Macrolide                                        | Tylosin                       | X                                                                                           |      |     |
|                                                  | Tylosin tartrate              |                                                                                             |      |     |
|                                                  | Erythromycin thiocyanate      |                                                                                             |      |     |
| Aminoglycoside                                   | Neomycin                      | X                                                                                           |      |     |
|                                                  | Neomycin sulphate             |                                                                                             |      |     |
|                                                  | Gentamicin                    |                                                                                             |      |     |
|                                                  | Gentamycin sulphate           |                                                                                             |      |     |
|                                                  | Streptomycin                  |                                                                                             |      |     |

|               |                          |   |   |  |
|---------------|--------------------------|---|---|--|
|               | Dihydrostreptomycin      |   |   |  |
| Sulfonamide   | Sulphaquinoxaline        | X |   |  |
|               | Sulphadimidine sodium    |   |   |  |
|               | Sulfadimidine            |   |   |  |
|               | Sulphaquinoxaline sodium |   |   |  |
|               | Sulphadiazine            |   |   |  |
|               | Trimethoprim             |   |   |  |
| Pleuromutilin | Tiamulin fumarate        |   | X |  |
| Amphenicol    | Florfenicol              |   | X |  |

**Table 3. Antimicrobial classes imported in Nigeria in 2018 to 2023**

| <b>Antimicrobials</b>                        | <b>2018</b>   | <b>2019</b>   | <b>2020</b>   | <b>2021</b>    | <b>2022</b>    | <b>2023</b>   | <b>Total</b>   |
|----------------------------------------------|---------------|---------------|---------------|----------------|----------------|---------------|----------------|
| <b>Aminoglycosides</b>                       | <b>11980</b>  | <b>100178</b> | <b>65485</b>  | <b>95657</b>   | <b>146586</b>  | <b>13152</b>  | <b>433039</b>  |
| <b>Amphenicols</b>                           |               |               |               | <b>49620</b>   |                | <b>599</b>    | <b>50219</b>   |
| <b>Cyclic polypeptides</b>                   |               |               |               |                |                | <b>70</b>     | <b>70</b>      |
| <b>Fluoroquinolones</b>                      | <b>44541</b>  | <b>102833</b> | <b>116973</b> | <b>111428</b>  | <b>226289</b>  | <b>19397</b>  | <b>621460</b>  |
| <b>Macrolides</b>                            | <b>11861</b>  | <b>180847</b> | <b>122065</b> | <b>361888</b>  | <b>150876</b>  | <b>91170</b>  | <b>918705</b>  |
| <b>Other quinolones</b>                      |               |               | <b>1447</b>   |                | <b>1229</b>    |               | <b>2676</b>    |
| <b>Penicillins</b>                           | <b>17317</b>  | <b>55639</b>  | <b>31565</b>  | <b>42171</b>   | <b>68887</b>   | <b>7415</b>   | <b>222994</b>  |
| <b>Pleuromutilins</b>                        |               | <b>126</b>    | <b>2</b>      | <b>1256</b>    | <b>7157</b>    |               | <b>8541</b>    |
| <b>Polymyxins</b>                            | <b>3720</b>   | <b>4536</b>   | <b>60856</b>  | <b>10235</b>   | <b>24417</b>   | <b>9752</b>   | <b>113514</b>  |
| <b>Sulfonamides (including trimethoprim)</b> | <b>10414</b>  | <b>3003</b>   | <b>32341</b>  | <b>5931</b>    | <b>139256</b>  | <b>75459</b>  | <b>266404</b>  |
| <b>Tetracyclines</b>                         | <b>119883</b> | <b>153392</b> | <b>295699</b> | <b>566477</b>  | <b>371036</b>  | <b>126117</b> | <b>1632605</b> |
| <b>Total</b>                                 | <b>219715</b> | <b>600554</b> | <b>726433</b> | <b>1244661</b> | <b>1135732</b> | <b>343131</b> | <b>4270226</b> |

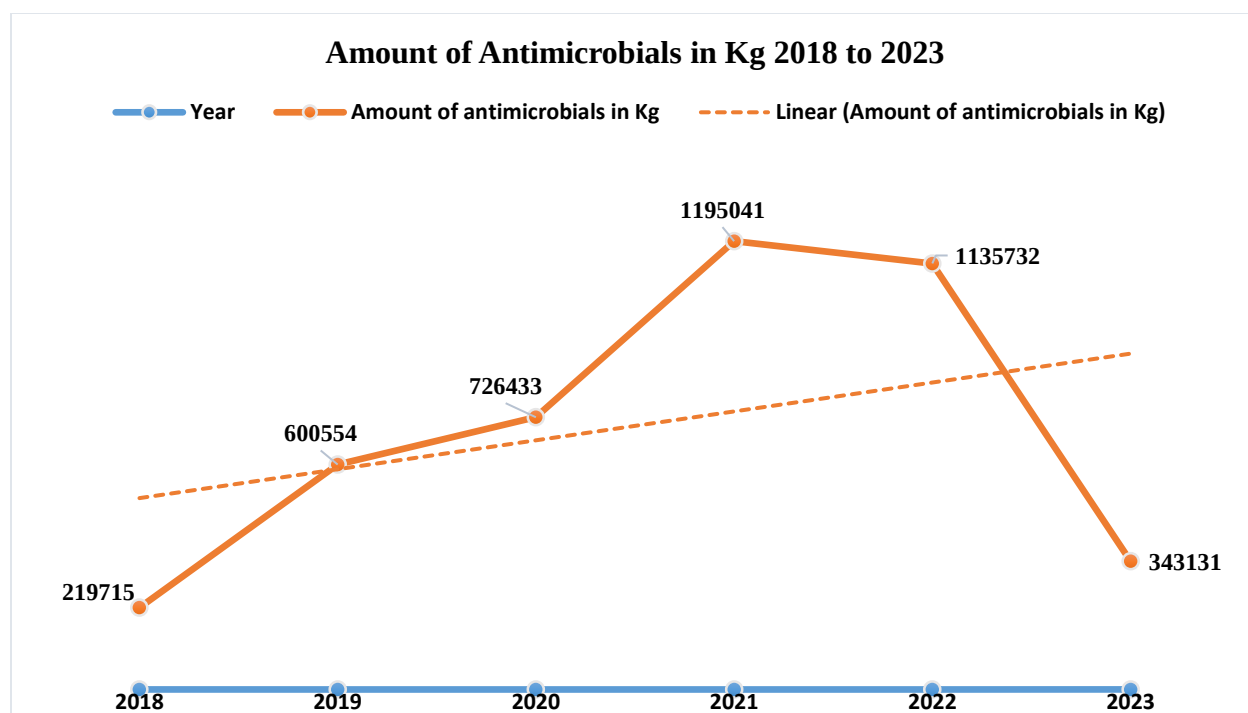


**Figure 2:** Amount of antimicrobials in Kg imported in Nigeria in 2018 to 2023

The amount of antimicrobial agents imported into the country for the period of 2018 and 2023 showed a progressive increase between 2018 and 2022, however, there was a significant decrease in 2023.

The growing human population in the country leads to increase in demand for food of animal origin. This demand is met by intensification of farming especially in the poultry and aquaculture industries. And with intensification of farming comes the challenge of diseases which increases the need for antimicrobials for treatment. This could describe the spike in the amount of antimicrobials in the country over the years.

However, Nigeria began the journey of combatting antimicrobial resistance in 2016, and by 2017, the country developed its first national action plan in line with the global action plan for AMR. The policy document guided the implementation of activities spanning from awareness creation and education, to AMR surveillance, infection prevention and control/biosecurity, antimicrobial stewardship and research and development.

Since then, the animal health sector had engaged with the stakeholders that use antimicrobials the most, such as farmers and animal health practitioners through sensitization workshops on responsible use of antimicrobials and the use of alternatives such as effective vaccination, biosecurity and infection prevention and control.

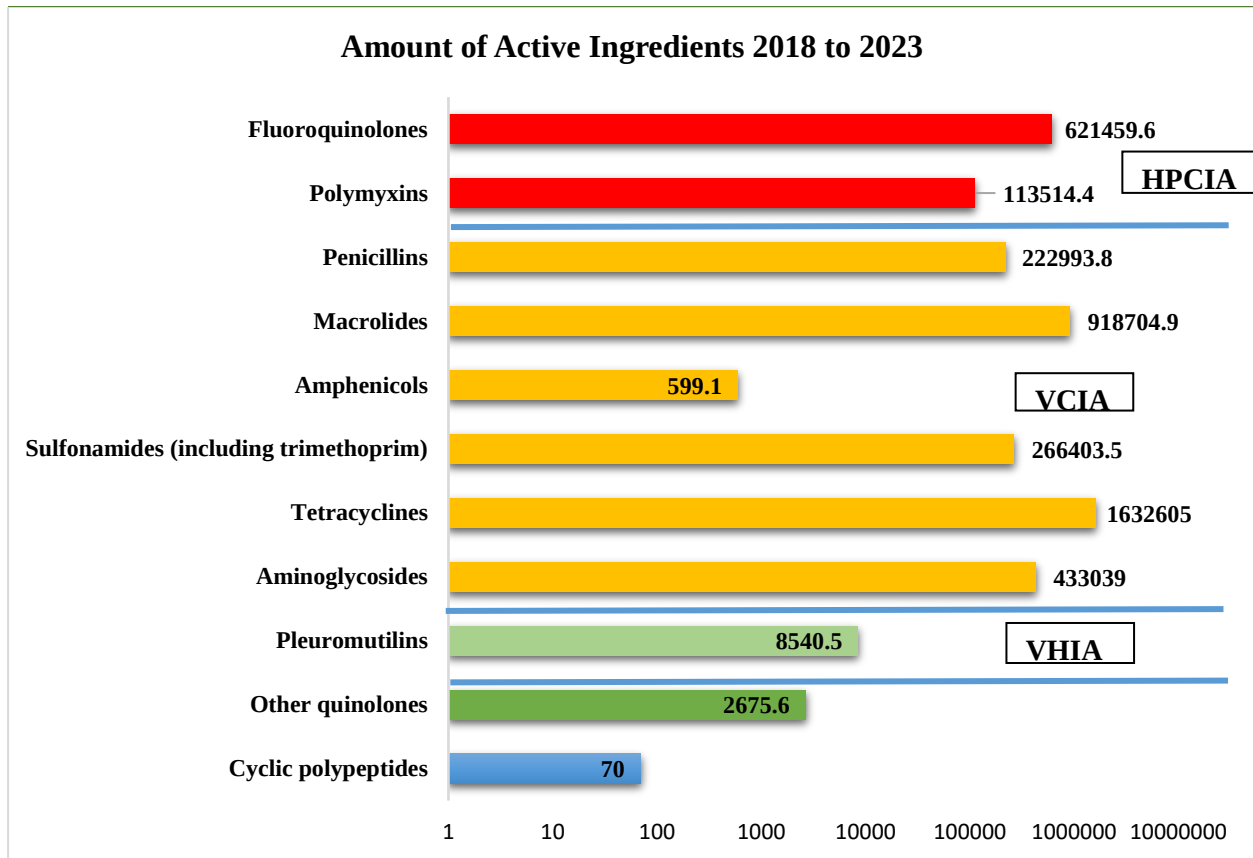


**Figure 3:** Amount of antimicrobials imported for 2018 to 2023

**Table 4: Antimicrobial Classes and Routes of administration**

|                                       | 2018            |                      | 2019            |                      | 2020            |                      | 2021            |                      | 2022            |                      | 2023            |                      |
|---------------------------------------|-----------------|----------------------|-----------------|----------------------|-----------------|----------------------|-----------------|----------------------|-----------------|----------------------|-----------------|----------------------|
| Antimicrobials                        | Oral route (kg) | Injection route (kg) | Oral route (kg) | Injection route (kg) | Oral route (kg) | Injection route (kg) | Oral route (kg) | Injection route (kg) | Oral route (kg) | Injection route (kg) | Oral route (kg) | Injection route (kg) |
| Aminoglycosides                       | 11607           | 88571                | 1448            | 10533                | 21125           | 44356                | 37294           | 58363                | 75162           | 71424                | 5662            | 7490                 |
| Amphenicols                           |                 |                      |                 |                      |                 |                      | 49620           |                      |                 |                      | 264             | 335                  |
| Cyclic polypeptides                   |                 |                      |                 |                      |                 |                      |                 |                      |                 |                      | 70              |                      |
| Fluoroquinolones                      | 102833          |                      | 1541            | 43000                | 45869           | 71103                | 107853          | 3374                 | 208802          | 17487                | 10761           | 8636                 |
| Macrolides                            | 82399           | 71597                | 7871            | 3207                 | 21444           | 72853                | 308948          | 48057                | 44249           | 106627               | 34739           | 56431                |
| Other quinolones                      |                 |                      |                 |                      | 1447            |                      |                 |                      | 1229            |                      |                 |                      |
| Penicillins                           | 13259           | 42380                | 12374           | 4943                 | 12289           | 19276                | 11409           | 30761                | 38301           | 30587                | 4000            | 3415                 |
| Pleuromutilins                        | 126             |                      |                 |                      |                 |                      | 1256            |                      | 7157            |                      |                 |                      |
| Polymyxins                            | 4536            |                      | 3720            |                      | 60856           |                      | 10232           |                      | 24417           |                      | 9752            |                      |
| Sulfonamides (including trimethoprim) | 3003            |                      | 10414           |                      | 10591           | 21750                | 3583            | 2298                 | 95078           | 44178                | 38461           | 36998                |
| Tetracyclines                         | 28615           | 118456               | 4386            | 115153               | 93189           | 191212               | 314924          | 244503               | 85570           | 285466               | 40879           | 82877                |
| Total                                 | 246378          | 321005               | 41753           | 176835               | 266810          | 420551               | 845119          | 387357               | 579963          | 555769               | 144587          | 196182               |

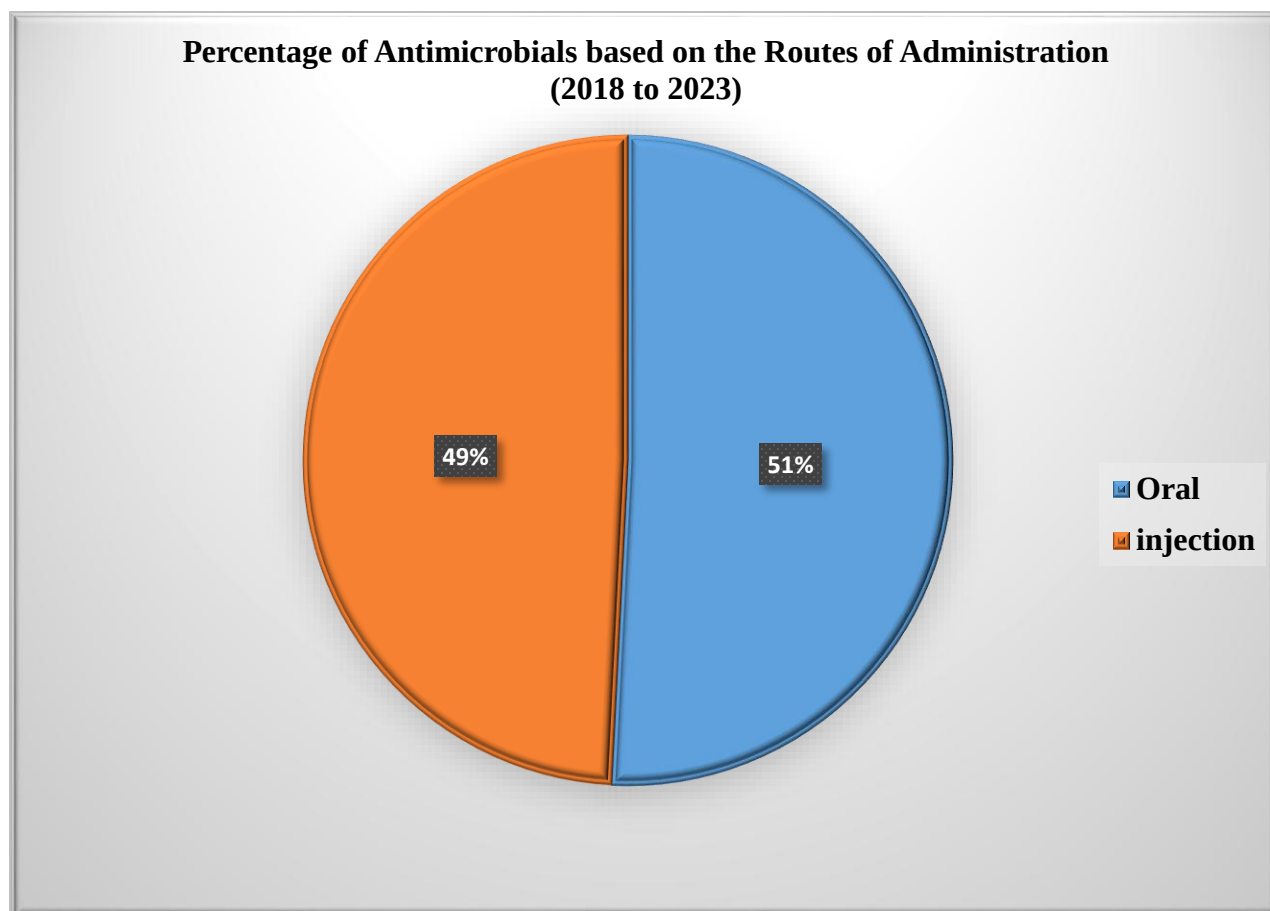


**Figure 4:** Percentage of Antimicrobials based on the Routes of Administration (2018 to 2023)

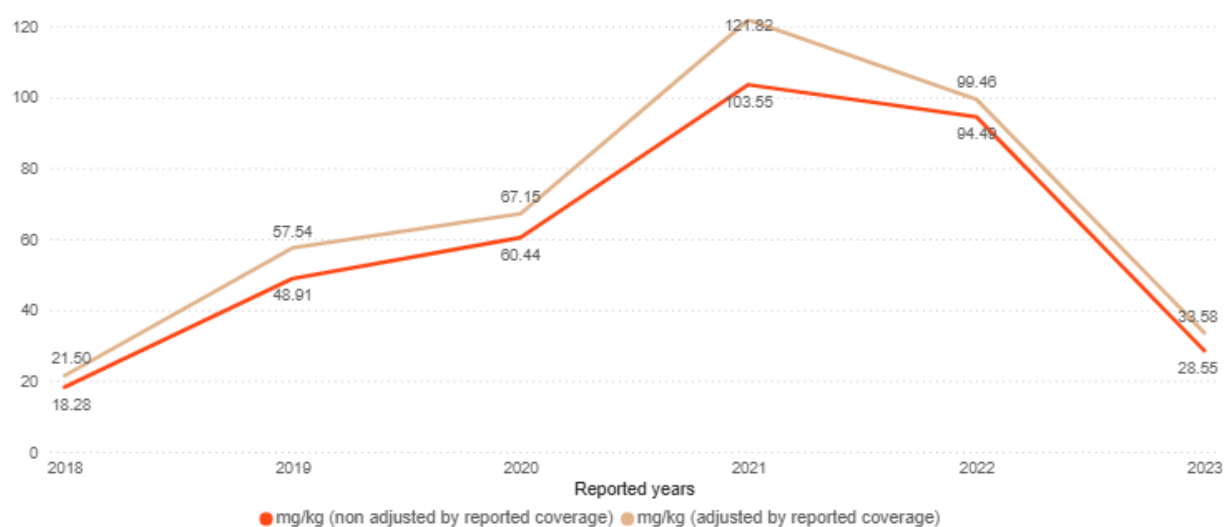


**Figure 5:** The total amount of antibiotic use (kg) may be influenced by several factors, including changes in the animal population. To account for this, the data can be further processed by dividing the total use (kg) by the animal biomass, yielding mg/kg values. Expressing antibiotic use in mg/kg

provides a standardised measure, enabling more meaningful comparisons. As shown in Figure 5, the trend in mg/kg is generally similar to that of the total kg, suggesting that fluctuations may be driven by factors other than changes in the animal population.

Expressing antibiotic use in mg/kg also facilitates comparisons between Nigeria and other countries or regions, as it accounts for differences in livestock population sizes. For example, when compared with neighbouring African nations, Nigeria's antibiotic use per biomass appears to be on the high side. Similarly, relative to global averages, the 2023 report showed that Nigeria's position is 50 out of 133. Such comparisons provide valuable context for understanding how national usage aligns with regional and international trends, and can help identify areas for targeted interventions or policy adjustments.

The antimicrobial agents imported during the period under review revealed that the highest quantity belong to the veterinary critically important antimicrobials (VCIA) (Figure 3) followed by the highest priority critically important antimicrobials (HPCIA). The HPCIA antimicrobials include colistin and fluoroquinolones. These are products that are important in human health and such should only be used in animals when it is absolutely necessary. The fact that they are still being used in animals is of importance. In some countries, colistin is banned for use in food animals. This calls for a regulation especially with regards to its importance in human health.

The sector has also established a surveillance system for AMR with a network of laboratories to strengthen AMR surveillance for evidence based data generation. The sector has one national reference laboratory (NRL) at the National Veterinary Research Institute in Vom. The NRL is ISO 17025 certified for the prioritized organisms *Salmonella* and *E.coli*. There are six sentinel labs across the geopolitical zones of the country (Ibadan, Enugu, Sokoto, Ilorin Zaria and Lagos). The sentinel sites were expanded to include three active sites in Asaba, Maiduguri and Jos.

Biosecurity guidelines and standard operating procedures were developed for poultry and aquaculture sectors to promote animal disease prevention and reduce the need for antimicrobials.

In order to promote responsible use of antimicrobials, the sector developed a national treatment guideline for the use of antimicrobial drugs in animals. Also, in collaboration with the one health stakeholders, an antimicrobial stewardship plan was developed.

All these efforts were geared towards reducing the need for antimicrobials in the animal health sector.

#### **IV. DISCUSSION**

Nigeria has been generating, analysing and reporting antimicrobial consumption data for 2014 to 2022. The data is reported in retrospect and the data for 2023 was validated by WOA in the first quarter of 2025. Majority of the products imported are labelled for use in terrestrial animal species and those administered through the oral route were more than the products administered through intramuscular injection. The classes reported include tetracyclines, fluoroquinolones, macrolides, aminoglycosides, penicillins, sulfonamides and polymyxins and sometimes pleuromutillins. In the early years of reporting, antimicrobial classes like amphenicols, nitrofurans and glycopeptides

were reported, but with the ban of some products such as nitrofurans in food animals by the regulatory authorities, these products are no longer registered for import.

The animal health sector in collaboration with the one health multi-sectoral team are working hard to reduce the use of antimicrobials in humans and animals, hence the development of some policy documents such as:

- The Animal Health Policy Document on AMR and AMU
- National guidelines for the use of antimicrobial drugs in animals
- Regulatory directive banning the use of colistin as coccidiostat in animal feed
- Antimicrobial stewardship plan
- Biosecurity guidelines and standard operating procedures.

These steps are aimed at mitigating AMR in addition to awareness creation and sensitization of critical stakeholders on responsible use of antimicrobials.

The national action plan NAP 2.0 highlights strategic interventions and activities using a holistic approach to fight AMR in the one health sphere.

Progress has been made since the development of the first NAP in 2017 and efforts are intensified to consolidate on the gains. This is evident in the assessment of NAP implementation using the WOAHPVS Evaluation tool, the WHO TrACCS and the Joint External Evaluation scores for the country.

As a result of the current situation and the data analysis, the country is at the level of developing regulations to ban the use of antimicrobials as growth promoters and a regulation to ban the use of colistin in food animals.

## **V. CONCLUSIONS**

Nigeria is committed to continuous monitoring of antimicrobial agents not only at the imports level but at sales and use levels, where the country gets a clearer picture of actual use of these products in animals.

At the moment, the country had a workshop with manufacturers, major importers and distributors of antimicrobials to sensitize them on antimicrobial resistance and use in the sector and discuss on the need for antimicrobial sales data collection and reporting. A reporting template was developed using Kobo tool and the questionnaire has since been deployed for AMS data collection.

In the same vain, in line with the national AMR active surveillance in the animal health sector, a tool for AMU data collection at farm level was developed and has since been deployed for AMU data collection in the farms where samples for AMR active surveillance would be collected. This might allow for correlation between AMR and AMU on livestock farms in the country.

The sector is equally committed to implementing policies that would curb the menace of AMR in Nigeria.

## VI. ANNEXES

### a. List of bann

| <br><b>VETERINARY MEDICINE AND ALLIED PRODUCTS DIRECTORATE (VMAP)</b><br>PLOT 1, 3 <sup>rd</sup> FLOOR ISOLO INDUSTRIAL ESTATE, OSHODI-APAPA EXPRESS WAY ISOLO, LAGOS STATE.<br><a href="mailto:vmap@nafdac.gov.ng">vmap@nafdac.gov.ng</a> , <a href="mailto:vmapnafdac@gmail.com">vmapnafdac@gmail.com</a> |                                                          |                                          |        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|------------------------------------------|--------|
| <b>NATIONAL AGENCY FOR FOOD AND DRUG ADMINISTRATION AND CONTROL (NAFDAC)</b><br><b>LIST OF BANNED VETERINARY DRUGS</b>                                                                                                                                                                                                                                                                       |                                                          |                                          |        |
| S/N                                                                                                                                                                                                                                                                                                                                                                                          | DRUG NAME                                                | CATEGORY                                 | STATUS |
| 1                                                                                                                                                                                                                                                                                                                                                                                            | Chloramphenicol                                          | Antimicrobial Agent                      | BANNED |
| 2                                                                                                                                                                                                                                                                                                                                                                                            | Malachite green                                          | Antifungal and Antiprotozoa              | BANNED |
| 3                                                                                                                                                                                                                                                                                                                                                                                            | Carbadox                                                 | Growth Promoters and Antimicrobial Agent | BANNED |
| 4                                                                                                                                                                                                                                                                                                                                                                                            | Furazolidone                                             | Antimicrobial Agent                      | BANNED |
| 5                                                                                                                                                                                                                                                                                                                                                                                            | Nitrofuraz                                               | Antimicrobial Agent                      | BANNED |
| 6                                                                                                                                                                                                                                                                                                                                                                                            | Chlorpromazine                                           | Tranquilizer Agent                       | BANNED |
| 7                                                                                                                                                                                                                                                                                                                                                                                            | Stilbens                                                 | Growth Promoter                          | BANNED |
| 8                                                                                                                                                                                                                                                                                                                                                                                            | Olaquinox                                                | Antibacterial Agent                      | BANNED |
| 9                                                                                                                                                                                                                                                                                                                                                                                            | Dimetridazole                                            | Antiprotozoa and Antibacterial Agent     | BANNED |
| 10                                                                                                                                                                                                                                                                                                                                                                                           | Ipronidazole                                             | Antiprotozoa, Antibacterial Agent        | BANNED |
| 11                                                                                                                                                                                                                                                                                                                                                                                           | Metronidazole                                            | Antiprotozoa, Antibacterial Agent        | BANNED |
| 12                                                                                                                                                                                                                                                                                                                                                                                           | Ronidazole                                               | Antiprotozoa, Antibacterial Agent        | BANNED |
| 13                                                                                                                                                                                                                                                                                                                                                                                           | Nitrofuraz, Furazolidone, Nitrofurantoin and Furataldone | Anti Bacterial Agent                     | BANNED |

### b. Glossary of Terms

**Antimicrobial agent:** A naturally occurring, semi-synthetic or synthetic substance that exhibits antimicrobial activity (kills or inhibits the growth of microorganisms) at concentrations attainable in vivo.

**Antimicrobial resistance:** The ability or state of microorganisms to survive and/or proliferate in concentrations of antimicrobial that would otherwise be microbiocidal or microbiostatic to other organisms of the same or similar species.

**Antimicrobial use monitoring:** Coordinated activities to identify, record, collate, analyze, interpret and communicate relevant data to draw informed conclusions regarding the extent, characteristics and trends in AMU.

**Biosecurity:** implementation of measures that reduce the risk of the introduction and spread of disease agent.

**Farm:** A defined or secured area of land or water-spread area that is used specifically for rearing food-producing animals.

**Growth promotion, growth promoters:** means the administration of antimicrobial agents to animals only to increase the rate of weight gain or the efficiency of feed utilization.

**Prudent Use of antimicrobials:** When antimicrobials are prescribed and administered in a responsible manner.