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THE USE OF ANTIBIOTICS IN PIG AND POULTRY PRODUCTION AS WELL AS ITS RESIDUAL IMPACTS ON HUMAN HEALTH

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Abstract
The extent and relative impact of antibiotics on human health in developing countries remain poorly understood due to limited information and inadequate surveillance systems. Therefore, this study focuses on the use of antibiotics among pig and poultry farmers in Edo and Delta States of Nigeria. A total of 50 pig and poultry farmers participated in this study. Data were collected using well-structured questionnaires on socio-economic characteristics of respondents, reasons for administering antibiotics to piglets and poultry, the types of antibiotics used, farmers' knowledge or awareness regarding the use of antibiotics, and AMR. Data collected were subjected to descriptive statistics and were analysed using SPSS. The results showed that most farmers administer antibiotics to their birds and pigs. The most commonly used antibiotics by farmers are sulfonamides and tetracyclines, and approximately 75% of farmers are unaware of antibiotic resistance. This improper use of antibiotics over time could lead to antibiotic residues in animal products and the development of antibiotic resistance in pigs and poultry. Farmers need to be educated about the dangers of indiscriminate use of antibiotics.

Keywords: antibiotics, human health, pig and poultry production, residue

Description of Problem

Antibiotics are substances produced naturally by living organisms or synthetically in laboratories. They can be administered orally, intravenously, or topically to kill or inhibit the growth of microorganisms (1). Nowadays, almost 80% of all food-producing animals receive medication for part or most of their lives (2). Antibiotics used in food-producing animals could leave residues in food items such as milk, meat, eggs, and their by-products, which could ultimately lead to health problems (3). Serious health issues might include allergy or hypersensitivity reactions, mutagenicity, and carcinogenicity (4). The extent and relative impact of antibiotics on human health remain poorly understood in developing countries due to limited information and surveillance systems. Therefore, this study focuses on the use of antibiotics among pig and poultry farmers as well as their residual impacts on human health.

Materials and Methods

The study was conducted in two of the three senatorial districts of Edo State (Edo South and Edo Central) and Delta State (Delta South and Delta Central). Edo South comprises seven Local Government Areas: Egor, Ikpoba-Okha, Oredo, Ovia North East, Ovia South West, Uhunmwode, and Orhionmwon. Edo Central has five Local Government Areas: Esan South-East, Igueben, Esan North-East, Esan West, and Esan Central. Delta Central consists of eight Local Government Areas: Ethiope East, Ethiope West, Sapele, Okpe, Ughelli North, Ughelli South, Udu, and Uvwie. Similarly, Delta South also includes eight Local Government Areas: Bomadi, Burutu, Isoko North, Isoko South, Patani, Warri South, Warri North, and Warri South-West. Approval was obtained from pig and poultry farmers before starting the research. The objectives and details of the study were clearly explained, along with assurances of confidentiality.

Data Collection: A total of 25 pig and poultry farmers participated in this study in Edo State, and another 25 pig and poultry farmers took part in Delta State. The primary data were collected using well-structured questionnaires.

Data analysis: The data collected from the Field Study were subjected to descriptive statistics and were analysed using SPSS version 26.

Results and Discussion

Table 1 shows that 22.0% of respondents had a secondary school education, 56% held a Bachelor's or higher degree, 16% had a diploma, and 6% were holders of a primary school leaving certificate. This observation suggests that most pig farmers in the Study Area were educated. Many farmers raised broiler chickens (22%) due to their fast growth and high feed-to-meat conversion. Additionally, 16% stocked a mix of broilers, turkeys, and layers to meet consumer needs and earn more income (Table 2). According to (5), chickens (broiler, layer) constitute 94% of global poultry and produce 90% of poultry meat, with turkey also significant. Furthermore, most farmers in the study areas give their birds antibiotics, as supported by (6), who said farmers do everything possible to care for their birds to prevent diseases and death. Besides feeding, the next tool in farmers' arsenal is the use of veterinary drugs (antibiotics).

Farmers employ various methods to prevent diarrhea in piglets. In this study, the majority (70.7%) use antibiotics for prevention (Table 3). Furthermore, a careful review of the survey results revealed that knowledge about the improper use of antibiotics and their related side effects is very limited in the study areas. About 75% of the farmers are unaware of antibiotic resistance. This study contradicts the understanding that educated respondents should have greater awareness of antibiotic resistance. The disparity could stem from most holding bachelor's degrees in non-clinical fields like political science, business administration, which may limit their understanding of antibiotic resistance in animals. This improper use of antibiotics over time could lead to antibiotic residues in animal products and the development of antibiotic resistance in pigs and poultry. Recent reports have shown that the use of large amounts of antibiotics can result in antibiotics depositing as residues in animal products (7).

Table 1: Socio-Economic Characteristics of respondents

Variable		Frequency (n = 50)	Percentage (%)
Type of Animal Farm			
	Pig farm only	24	48.0
	Poultry farm only	5	10.0
	Pig and Poultry	19	38.0
	General farming	2	4.0
Educational Background	Primary school	3	6.0
	Secondary school	11	22.0
	Diploma	8	16.0
	Bachelor's Degree or Higher	28	56.0
Position	Owner	18	36.0
	Manager	8	16.0
	Supervisor	8	16.0
	Farm Assistant	12	24.0
Number of years working on the farm	Less than 1 year	11	22.0

	2 - 3 years	14	28.0
	3 - 5 years	11	22.0
	Above 5 years	14	28.0

Table 2: Poultry Farmers' Use of Antibiotics

Variable		Frequency (n = 50)	Percentage (%)
What type of birds?	Broiler Chickens	11	22.0
	Layers	1	2.0
	Broiler chicken and Turkeys	2	4.0
	Broiler chickens, Turkeys, and Layers	8	16.0
	Broiler chickens and Layers	3	6.0
Do you give antibiotics?	No	1	2.0
	Yes	23	46.0
When do you give antibiotics?	Every day in their water	6	12.0
	Only when they are sick	9	18.0
	When the veterinarian recommends	8	16.0
	Every week for five days	1	2.0
Why do you give antibiotics?	Because they are sick	12	24.0
	Because I want them to gain weight	1	2.0
	Because my boss says so	3	6.0
	Because my counsellor/consultant says it's good for the birds	5	10.0
Do you administer antibiotics to your birds until the day you sell them?	No	10	20.0
Is it every time your birds are sick that you give antibiotics	Yes	6	12.0
	No	10	20.0
	Yes	4	8.0

Conclusion and Application

This study shows that many poultry and pig farmers use antibiotics, with sulfonamides and tetracyclines being the most common. Additionally, around 75% of farmers are unaware of antibiotic resistance. This improper use of antibiotics over time could lead to antibiotic residues in animal products and the development of resistance in pigs and poultry. As a result, farmers in Edo and Delta States need to be educated about the risks of reckless antibiotic use.

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Table 3: Pigs Farmers' Use of Antibiotics

Variable		Frequency	Percentage
What are the things you do to prevent diarrhea among your piglets?	Keeping them according to their ages	14	24.1
	Giving them antibiotics	41	70.7
	Giving them anti-stress	15.5	4.0
	Giving them vaccines	24.1	16.0
	Giving them medicines	16	27.6
	Cleaning the environment regularly	39	67.2
	Regular supply of clean water and feed	37	63.8
	Separate sick pigs from others	32	55.2
When do you give antibiotics to your piglets	Every day in their water	7	12.1
	Every day in their feed	3	5.2
	Only when they are sick	29	50.0
	When the veterinarian recommends	23	39.7
	Every week for three days	1	1.7
	Every week for five days	2	3.4
	I don't give them antibiotics	1	1.7
	I give herbal preparations	13	22.4
Why do you give antibiotics to your piglets?	Because they are sick	34	58.6
	Because I want them to gain weight	3	5.2
	Because I don't want them to lose weight	6	10.3
	Because my boss says so	5	8.6
	Because my counsellor/consultant says it's good for them	11	19.0
What are the Names of the Antibiotics you give your Piglets?	Sulphonamide	31	43.1
	Tetracycline	35	48.6
	Others	6	8.3
Sources of antibiotic Purchase	Drug company	17	29.3
	Human drug store	4	6.9
	Animal drug store	42	72.4
	Internet and online	1	1.7
	False	35	70.0
	Do not know	3	6.0

Do you know whether antibiotic use in food-producing animals can induce AMR in those animals	True	12	24.0
Do you know whether Nigeria has banned the use of antibiotics as a growth promoter in food-producing animals	False	20	40.0
	Do not know	8	16.0
	True	21	42.0
Do you think the use of antibiotics is necessary for pig farming	False	3	6.0
	Do not know	2	4.0
	True	44	88.0