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Peer knowledge sharing on social media: investigating antibiotic overuse by poultry farmers in Zambia

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Abstract

Small-scale farmers often rely on online social media platforms for information and support, where the quality and accuracy of shared knowledge can vary widely. This study investigated peer-to-peer knowledge-sharing practices about antibiotics and potential overuse among small-scale poultry farmers on a Zambian Facebook group, focusing on how farmers communicate, diagnose, and address poultry health issues. The research involved qualitative analysis of posts and comments posted in the Poultry Farming in Zambia Facebook group. Themes were identified through content analysis of the discussions, highlighting communication patterns, diagnostic approaches, management practices, and antibiotic usage. A total of 200 posts and several comments were analyzed. Five themes emerged from the analysis highlighting non-engaging communication among farmers, with significant knowledge gaps and little correction or enhancement of responses. Farmers frequently used visual symptoms for diagnosis, though this method was often insufficient for accurate treatment while health management practices were largely reactive, with farmers seeking immediate solutions during crises rather than employing preventive measures. There was a heavy reliance on self-prescribed antibiotics, with multiple antibiotics often used without proper diagnosis - even antibiotics which are highly critical for human health. The findings underscore the need for better education on poultry health management and the risks of indiscriminate antibiotic use, which can contribute to antibiotic resistance. Improved access to veterinary services and resources is essential for enhancing poultry health practices.

Introduction

Peer-to-peer learning in agriculture is highly valued for helping farmers adopt new technologies and sustainable practices leading to increased productivity [1-4]. In the absence of formal agricultural education, informal social networks become essential [5,6]. Discussion groups, farm demonstrations, and direct farmer interactions are effective ways through which agricultural information is shared [7-9]. The proliferation of social media has revolutionized the way information is shared, particularly in the realm of agriculture [10]. Farmers and agricultural professionals increasingly turn to platforms like Facebook, Twitter, and specialized forums to exchange knowledge, seek advice, and discuss practices related to various aspects of farming [10]. Among these topics, antibiotic use in poultry has garnered significant attention [11]. The ease of accessing and sharing information can lead to the spread of misinformation or unverified practices similar to what was observed during the COVID-19 pandemic [12,13], contributing to the potential overuse and misuse of antibiotics. This issue is particularly pressing in the context of escalating antibiotic resistance, a global health crisis that threatens both human and animal health [14,15]. According to the World Health Organization, antimicrobial resistance was directly responsible for 1.27 million deaths in 2019 [16].

Facebook, the largest social media network, hosts numerous groups where agricultural knowledge can be shared. Agricultural knowledge sharing on Facebook often takes the form of closed and open groups numbering hundreds to thousands [10]. These groups are typically managed by administrators who approve and moderate posts with limited control over members´ responses [10]. Understanding the dynamics of social media-driven knowledge sharing is crucial for several reasons. First, it provides insights into how farmers adopt and implement antibiotic practices based on peer advice. Second, it helps identify gaps in knowledge and potential misinformation that could lead to harmful practices. Finally, it offers a pathway to develop targeted interventions and educational campaigns to promote responsible antibiotic use and combat antibiotic resistance. This qualitative research explored how social media influences antibiotic practices among poultry farmers, examining the

types of information shared and how it is shared, the credibility of sources, and the potential impact of this shared knowledge on farming practices.

Methods

The research adopted a case study design, employing qualitative data collection techniques to explore the practices and potential overuse of antibiotics in poultry farming facilitated through social media. The primary target was a popular Facebook group in Zambia, poultry farming in Zambia, where poultry farmers actively share information about poultry business, poultry diseases, and the use of antibiotics. The Facebook group has a membership of 317, 000 people.

Data collection: a checklist was developed to systematically collect data on posts and comments from the farmers for a period of two years from January 2022 to December 2023. Voluntary comments by veterinarians and veterinary paraprofessionals were excluded from the study. To locate relevant posts within the group, key terms like "medicine," "antibiotics," "diarrhea," "diseases," "dying," "sick," "birds," "chickens," and "help" were used in the search window.

Data management and analysis: data was managed and stored in NVivo 12. 3 (Lumivero, Denver, Colorado, USA). Cross-referencing of collected information with established veterinary guidelines and scientific literature was done to verify the accuracy of the information shared within the group. This step was crucial to highlight discrepancies and misinformation. An inductive approach and thematic analysis were used to analyze the data to identify emerging themes and sub-themes. The thematic analysis involved coding basic categories related to antimicrobial use, diagnosis, poultry management, and conversational approaches. To develop the themes, codes were grouped into broader categories that reflected the practices, knowledge levels, and attitudes toward antibiotic use. The themes were generated from posts related to questions on antimicrobial use, diagnostic approaches, hints about a crisis, and conversational approaches. Raw narratives from posts and comments have been provided in the results. Identification of drugs under the WHO watch involved identification, tabulation, and classification of antibiotics according to the 2018 WHO grouping of critically important, highly important, and important [17].

Ethical considerations: to ensure ethical compliance, the privacy and confidentiality of the group members were maintained. Identifiable information was anonymized, and consent was sought from group administrators to conduct the study. Identities for companies that manufactured the reported antibiotic trade names were withheld. Since the data was publicly available, ethical approval from a review board was not required.

Results

The study analyzed 200 posts and 1500 comments from a Facebook group, uncovering five major themes along with subthemes. These included communication and interaction styles, characterized by unidirectional communication, personal experience-based responses, and inadequate moderation; knowledge gaps among participants; crisis-driven queries focused on immediate solutions while neglecting preventive measures; visual diagnostics; and an over-dependency on antibiotics.

Communication and interaction styles

Unidirectional communication: communication about antibiotic use in chickens within the Facebook group was primarily unidirectional, lacking in-depth discussion or probing into the comments. For instance, a post asking, "what medication do you give to three days old chicks when they have diarrhea?" received brief responses such as "use amprolium, it is the best" and "use Zagro cure (multivitamins)," with little engagement or follow-up from those seeking

advice. This absence of follow-up meant that affected farmers did not explore the effectiveness of the suggested treatments, and recommendations were often provided without a full understanding of the context, focusing solely on treatment options.

*Anecdotal responses:*many responses were anecdotal rather than based on scientific evidence, as seen in another post where a farmer inquired, "what kind of medicine can I give these chicks, it's now day 3, they are just dying, and being paralyzed?" The comments ranged from advice to use "itembusha (aloe vera) mixed with pawpaw leaves" to suggesting specific treatments like "orxfarm" or "Gentadox," often without any standardization regarding dosages or treatment durations. In a separate inquiry about the best medication for cough and flu, responses varied widely, with suggestions including "Fluban," "Norflox," and various home remedies like ginger and garlic, illustrating the lack of a consistent approach to providing veterinary advice.

*Inadequate moderation:*inadequate moderation further complicated the situation, with no quality control to ensure the accuracy or reliability of the advice given. Farmers were left to choose recommendations based on personal preference rather than verified information. For example, in a post seeking advice on the most effective medicine for cough and flu, responses varied widely, with suggestions including "Fluban," "Norflox," and various home remedies like ginger and garlic. This lack of oversight also led to unverified treatments being proposed; one farmer asked, "my chicks have diarrhea, what medicine can I give to quickly intervene?" and received responses such as, "soak a bit of soda and put it in their drinking water," highlighting the potential risks of following unvetted advice. Overall, the communication dynamics within the group reflected significant gaps in both engagement and moderation, leaving farmers without the necessary support for effective decision-making.

Knowledge gaps: significant knowledge gaps were evident among participants in the Facebook group, with many responses lacking correction or enhancement from others. For instance, in response to a post asking, "my chicks have diarrhea, what medicine can I give to quickly intervene? Kindly help," the comments included suggestions such as "soak a bit of soda and put it in their drinking water," and a warning that "that's not a disease please, don't give medicine to the chickens which are not sick," alongside the more informed recommendation of "Amprolium teaspoon in 5 liters for 3 days." This disparity highlighted a lack of basic veterinary knowledge and limited exposure to professional guidance. Furthermore, advice often came in piecemeal, failing to address broader management issues, vaccination protocols, or any prior treatments the farmer may have attempted. In another instance, a post queried, "what kind of medicine can I give these chicks, it's now day 3, they are just dying and being paralyzed. What could be the problem, please help. They are 2 weeks, 2 days old." The responses ranged from recommending "itembusha (aloe vera) mixed with pawpaw leaves" to suggesting specific products like "orxfarm" and "Gentadox," but did not delve into the underlying issues or necessary preventive measures. This lack of comprehensive support underscored the pressing need for better education and structured guidance within the community.

Crisis-driven queries: the posts from farmers were primarily reactive, emphasizing immediate problem-solving rather than proactive health management practices such as biosecurity and vaccination. Most queries arose during crisis moments, with members seeking quick remedies instead of long-term health strategies. For instance, one post expressed desperation: "Mwebantu (my people), my chicks are just closing their eyes and end up dying; what could be the problem and what medication can I give them? Please help me, my fellow poultry farmers." Other posts similarly reflected urgent needs, such as one asking, "What medicine can I give these chickens?

Everyday it's one chicken dying. No diarrhea but I don't know what is causing the problem," and another seeking advice for coughing chicks: "My 7 days old chicks are coughing a lot, what medication can I give? Help before I lose my chicks. Help please."

In contrast, discussions about preventive measures were notably scarce. Few posts addressed crucial topics like biosecurity or vaccination protocols, with the focus primarily on treatment. For example, when someone inquired, "what medicine do you give to new chicks on day one?" the comments consisted largely of specific product recommendations like "I give Neoxychick for 7 days," "Aliseryl or STR 600 or Neoxychick or backtofos plus," and other treatment suggestions. This lack of emphasis on prevention highlights a significant gap in the community´s approach to poultry health, underscoring the need for a shift toward proactive management practices.

Over-dependency on antibiotics: the discussions within the Facebook group revealed a concerning over-dependency on antibiotics, with many participants exhibiting self-prescription habits. Respondents frequently recommended multiple antibiotics without conducting thorough probing or providing adequate diagnoses, often relying solely on personal experience to justify their suggestions. This pattern indicated a potential misuse of antibiotics, as farmers typically experimented with various medications before seeking help. For example, one post read, "good morning all farmers, I need help from you people, my birds are 1 month 2 days old and they are sick. I have tried many medications and nothing has worked," to which the comments included recommendations like "give them foss bac," "use aloe vera after removing the white stuff," and "Infectious Coryza use Gentadox or Oxytetracycline 50%."

In another instance, a farmer inquired, "my chickens are coughing which medicine can I give? Please help," leading to a variety of responses such as "Oxytetracycline," "chili is the best," and "Fluban you never go wrong." Further queries, such as "what is the best medicine for white diarrhea?" drew comments recommending everything from "soda helps" to "Doxin" and "Amprolium," illustrating the lack of a standardized approach to treatment. One post pleading for assistance with weak chicks asked, "Brethren help a brother, 3 weeks old chicks, very weak. What could be the problem? I have lost 2 in a space of three days," prompted replies urging the use of antibiotics without proper context, such as "Use antibiotics for five days" and "If the situation does not improve see a veterinarian for expert advice." This reliance on antibiotics without adequate evaluation highlighted a critical need for improved knowledge and practices within the farming community.

Commonly used antibiotics: a wide range of antibiotics was mentioned in the analyzed comments (Table 1). Approximately 70% of antibiotic brands suggested by the respondents contained at least two different types of antibiotics in a single product (Table 1).

Visual diagnostics: farmers often utilized visual diagnostics by posting images of their sick birds or specific symptoms, such as diarrhea or bloody faeces, in hopes of receiving diagnostic advice from the community. For instance, one post asked, "Which medication can I use when chickens are pooping this?" accompanied by a picture of the affected droppings. The responses varied, with suggestions including "use amprolium or sulphadiazine," "keep poultry clean first before medication," and other recommendations like "Gentadox," "Use Zagro," and "ESB3." In another instance, a post titled "good morning, everyone, what medicine can I give to my chickens with this kind of diarrhea?" Featured a similar approach, with accompanying imagery. Comments in response included advice such as "Sulphadimadine, you should change the litter," "ESB3," and practical tips like "change the sawdust, spray the room with viral cure, and give amprolium." These examples illustrate how visual aids were used to facilitate discussions around

diagnosis and treatment, though they often lacked comprehensive context and deeper exploration of underlying issues.

Discussion

This study explored how farmers used social media to share knowledge about antibiotic use in poultry in Zambia. Five major themes linked to communication, knowledge, diagnostics, crisis management, and antibiotic usage emerged from the analysis. The findings revealed key insights into the communication dynamics, practices, and challenges faced by small-scale poultry farmers in Zambia, especially during outbreaks of diseases.

The communication styles reflected a traditional advice-seeking dynamic, which might limit collaborative problem-solving and peer-to-peer learning. Rarely were the responses moderated or vetted to ensure that the right information was given to those who needed it. Hence, the group was a fertile ground for misinformation about antibiotics and their use in poultry, a scenario that was also observed during the COVID-19 pandemic [12,13]. Additionally, the responses were often too many and varied which probably made it difficult for individuals seeking help to pick the correct information. It is an established observation that information overloads without guidance can lead to poor decision-making, especially when the recipients do not have the requisite knowledge about a particular subject [18]. The group could benefit from interactive discussions led by individuals with formal and experiential poultry farming knowledge [11]. Participants often responded to questions about poultry health with simplistic and potentially misguided advice, reflecting a broader issue of inadequate veterinary knowledge, experience, and the lack of professional input. In many cases, recommendations of treatment options were not focused on addressing underlying issues such as potential nutritional deficiencies, vaccination, or previous treatments. The advice provided was often fragmented and lacked a comprehensive approach to diagnosing and managing the problem, leading to potentially ineffective or harmful interventions or overuse of antibiotics. These findings underscore the need for better educational resources and professional veterinary guidance within the online community concerning poultry management [19].

This study also revealed a predominant tendency among farmers to seek immediate, crisis-driven solutions. Posts often reflected urgent requests for treatment options in response to acute issues like unexplained deaths, persistent coughing, or sudden health declines in chicks. This trend is not unique to Zambia [15,20]. Analyzed comments were characterized by self-prescription and the frequent use of multiple antibiotics without proper diagnosis or consideration of the underlying health issues. Respondents routinely recommended a variety of antibiotics and treatments based on personal experience rather than clinical evidence or thorough diagnostic probing. This practice highlights a critical misuse of antibiotics, with many suggested drugs being of high importance to human health [17]. The over-reliance on these medications may result in selection pressure stimulating the emergence of multi-drug resistant bacteria [21].

Similar to other studies, 70% of antibiotic brands used by poultry farmers contained more than two different types of antibiotics [15]. This was 20% higher than what was reported in Kenya [15]. Combination of antibiotics has been indicated as one of the major drivers of emerging multiple drug-resistant microorganisms [14]. Some of the antibiotics considered critically important by WHO for human health were antibiotics of choice for poultry farmers. They included Colistin, Neomycin, Gentamycin, Fosfomycin, and Tylosin [22]. Their usage in poultry has been reported elsewhere but farmers cannot be blamed as these drugs are commercially available and approved for use in poultry [11,14,15,20]. Therefore, what is required is not a ban on the usage of such antibiotics in poultry but educating farmers about antibiotic stewardship and strengthening national regulation

and enforcement regarding access [15,20,23]. If well managed, biosecurity measures in poultry can reduce the amount of antibiotic usage in any livestock farming setup as reported in Belgium among pig farmers [24]. Moreover, adopting basic biosecurity measures can reduce the farmers´ expenditure on drugs and the losses due to sudden disease outbreaks [24].

Meanwhile, the use of visual aids (pictures of sick birds and types of diarrhea), in some cases, was useful for aiding in correct diagnosis and suggesting treatment options, especially in the absence of veterinary professionals. However, visual aids were probably only useful to experienced farmers who had seen such symptoms under the guidance of a veterinary professional. While useful, this approach may not always be accurate due to the similarity in symptoms across poultry diseases [25]. Consequently, it could lead to misdiagnosis or improper treatment.

Overall, the study findings were robust even though the study could have benefited from stakeholder interviews to supplement the content analysis to gain deeper insights into the motivations behind sharing specific types of information and the perceived credibility of the sources. However, freely shared information tends to speak to what people are all about and their thought processes [26]. In formal interviews, people may give information to simply please the interviewer.

Conclusion

The study underscores the urgent need for improved education and support in poultry health management through farmer networks such as Facebook, as the misuse of antibiotics by small-scale farmers poses a significant risk to both animal and human health.

Competing interests

The authors declare no competing interests.

Authors' contributions

Samuel Munalula Munjita designed the study, collected the data, and drafted the manuscript; Samuel Munalula Munjita and Chisoni Mumba analyzed the data. All authors verified the data and analysis. All the authors read and approved the final version of this manuscript.

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Table

Table 1: list of commonly suggested antibiotics and WHO status

References

1. Nyambo DG, Luhanga ET, Yonah ZO, Mujibi FD, Clemen T. Leveraging peer-to-peer farmer learning to facilitate better strategies in smallholder dairy husbandry. Adapt Behav. 2022;30(1): 51-62. **Google Scholar**
2. Sutherland LA, Marchand F. On-farm demonstration: enabling peer-to-peer learning. J Agric Educ Ext. 2021;27(5): 573-590. **Google Scholar**
3. Organic Farming Research Foundation. Best Practices for Virtual Peer-to-Peer Farmer Learning. 2022. Accessed June 2, 2024.
4. Kolb DA. Experiential learning: Experience as the source of learning and development. FT press; 2014 Dec 17. **Google Scholar**

5. Boahene K, Snijders TAB, Folmer H. An Integrated Socioeconomic Analysis of Innovation Adoption: The Case of Hybrid Cocoa in Ghana. J Policy Model. 1999;21(2): 167-184. **Google Scholar**
6. Lyon F. Trust, Networks and Norms: The Creation of Social Capital in Agricultural Economies in Ghana. World Dev. 2000;28(4): 663-681. **Google Scholar**
7. Haythornthwaite C. Social network analysis: An approach and technique for the study of information exchange. Libr Inf Sci Res. 1996;18(4): 323-342. **Google Scholar**
8. Baumgart-Getz A, Prokopy LS, Floress K. Why farmers adopt best management practice in the United States: A meta-analysis of the adoption literature. J Environ Manage. 2012 Apr 15;96(1): 17-25. **PubMed**| **Google Scholar**
9. Baird J, Jollineau M, Plummer R, Valenti J. Exploring agricultural advice networks, beneficial management practices and water quality on the landscape: A geospatial social-ecological systems analysis. Land Use Policy. 2016;51: 236-243. **Google Scholar**
10. Graybill-Leonard M, Meyers C, Doerfert D, Irlbeck E. Using Facebook as a Communication Tool in Agricultural-Related Social Movements. J Appl Commun. 2011;95(3): 5. **Google Scholar**
11. Zowawi HM, Abedalthagafi M, Mar FA, Almalki T, Kutbi AH, Harris-Brown T *et al*. The Potential Role of Social Media Platforms in Community Awareness of Antibiotic Use in the Gulf Cooperation Council States: Luxury or Necessity? J Med Internet Res. 2015 Oct 15;17(10): e233. **PubMed**| **Google Scholar**
12. Lee SK, Sun J, Jang S, Connelly S. Misinformation of COVID-19 vaccines and vaccine hesitancy. Sci Rep. 2022 Aug 11;12(1): 13681. **PubMed**| **Google Scholar**
13. Ngai CSB, Singh RG, Yao L. Impact of COVID-19 Vaccine Misinformation on Social Media Virality: Content Analysis of Message Themes and Writing Strategies. J Med Internet Res. 2022 Jul 6;24(7): e37806. **PubMed**| **Google Scholar**
14. McGettigan P, Roderick P, Kadam A, Pollock A. Threats to global antimicrobial resistance control: Centrally approved and unapproved antibiotic formulations sold in India. Br J Clin Pharmacol. 2019 Jan;85(1): 59-70. **PubMed**| **Google Scholar**
15. Kariuki JW, Jacobs J, Ngogang MP, Howland O. Antibiotic use by poultry farmers in Kiambu County, Kenya: exploring practices and drivers of potential overuse. Antimicrob Resist Infect Control. 2023 Jan 5;12(1): 3. **PubMed**| **Google Scholar**
16. World Health Organization. Antimicrobial resistance. 2023. Accessed June 22, 2024.
17. World Health Organization. Advisory Group on the WHO List of Critically Important Antimicrobials for Human Medicine (AG-CIA). 2018. Accessed September 15, 2024.
18. Zheng M, Marsh JK, Nickerson JV, Kleinberg S. How causal information affects decisions. Cogn Res Princ Implic. 2020 Feb 13;5(1): 6. **PubMed**| **Google Scholar**
19. Kirchhelle C. Pharming animals: a global history of antibiotics in food production (1935-2017). Palgrave Commun. 2018;4(1): 96. **Google Scholar**
20. Sharma G, Dey TK, Hazarika RA, Shome BR, Shome R, Singh VP *et al*. Knowledge and practices related to antibiotics among poultry producers and veterinarians in two Indian states. One Health. 2024 Mar 5;18: 100700. **PubMed**| **Google Scholar**
21. Butaye Patrick, Devriese Luc A, Haesebrouck F. Antimicrobial Growth Promoters Used in Animal Feed: Effects of Less Well Known Antibiotics on Gram-Positive Bacteria. Clin Microbiol Rev. 2003 Apr;16(2): 175-88. **PubMed**| **Google Scholar**

22. WHO. Critically important antimicrobials for human medicine: 6th revision. 2019. Accessed June 22, 2024.
23. Subedi D, Jyoti S, Thapa B, Paudel S, Shrestha P, Sapkota D *et al*. Knowledge, Attitude, and Practice of Antibiotic Use and Resistance among Poultry Farmers in Nepal. Antibiotics (Basel). 2023 Aug 25;12(9): 1369. **PubMed**| **Google Scholar**
24. Raasch S, Postma M, Dewulf J, Stärk KDC, grosse Beilage E. Association between antimicrobial usage, biosecurity measures as well as farm performance in German farrow-to-finish farms. Porcine Health Manag. 2018 Dec 14;4: 30 **PubMed**| **Google Scholar**
25. Degu MZ, Simegn GL. Smartphone based detection and classification of poultry diseases from chicken fecal images using deep learning techniques. Smart Agric Technol. 2023;4: 100221. **Google Scholar**
26. Jarvenpaa SL, Staples DS. The use of collaborative electronic media for information sharing: an exploratory study of determinants. J Strateg Inf Syst. 2000;9(2-3): 129-154. **Google Scholar**

Table 1: list of commonly suggested antibiotics and WHO status

Trade name	**Active ingredient**	**WHO status of use in humans 2018**
Gentadox	Gentamycin	Critically important
	Doxycycline	Highly important
Amox Col	Amoxycillin	Highly important
	Colistin	Critically important
Kenflox, Fluban, Interflox	Enrofloxacin-not a human antibiotic but metabolised to ciprofloxacin	Ciprofloxacin is considered highly important
Neoxychick	Neomycin	Critically important
	Oxytetracycline	Highly important
Septrin	Trimethoprim	Highly important
	Sulphamethoxazole	Highly important
Bactofos plus	Fosfomycin	Critically important
	Tylosin tartrate	Critically important
Tylodoxin	Doxycycline hydrate	Highly important
	Tylosin tartrate	Critically important
Tetravet, Limoxin, Tetroxy Embacycline, Ashoxy50	Oxytetracycline	Highly important
Esb3	Sulfaclozine sodium	Highly important
Chloramphenicol	Chloramphenicol	Highly important