

Assessment Of Cattle Handlers' Practices And Associated Risks To Human Health And Environmental Safety In Afijio Local Government.

Azeez Abdullahi Akinwale PhD

Department of Agricultural Education
Federal College of Education (Special), Oyo
E-mail: azeez.abdullahi2312@fcesoyo.edu.ng
08054676947

Abstract: *This study assessed cattle handlers' practices and associated risks to human health and environmental safety in Afijio Local Government Area of Oyo State, Nigeria. A multistage sampling technique was used to select 30 settlement heads (Hakimi) from three major cattle-producing towns: Akinmorin, Ilora, and Awe. Data were collected using key informants interviewer-administered questionnaires and analyzed using descriptive statistics. Results showed that 90% of respondents were aged 60 years and above, all were male, married, and predominantly Fulani, with 96.7% having no formal education. All respondents had over 20 years of herding experience, with most controlling between 6–10 herders and owning over 201 cattle. Although 93.3% reported easy access to veterinary services, 91.7% relied on traditional remedies for treating cattle diseases, including harmful substances such as petrol mixed with salt, calcium carbide, ethanol with procaine penicillin, and battery fluid. These practices pose significant risks of chemical residues in meat, antimicrobial resistance, and environmental contamination. The study highlights the urgent need for improved veterinary extension services, stricter regulation of drug use, and targeted education programs to promote safe, evidence-based cattle health management practices in rural communities.*

Keywords: Cattle handlers, Traditional remedies, Public health risk, Environmental contamination, Food safety,

Introduction

Livestock disease negatively impact production and distort values due to domestic and international market shocks resulting in market inefficiencies (FAO, 2016). Recent emphasis on food safety, food security, biodiversity and improving animal and public health are highly necessary to reduce risk of disease introduction and spread within animal populations and from animal and human population (Smith, 2005). It is important to understand the patterns and risk factors that can increase or decrease the likelihood of a disease because disease does not occur randomly in a population. Disease which can be infectious and non-infectious can have direct and indirect causes following the traditional model of triads which consist of an external agent (bacteria, virus, parasite, fungi, or prion), a susceptible host and an environment, including management and husbandry practices, which bring the host and agent together. In this model, disease results from the interaction between the agent and the susceptible host in an environment that supports transmission of the agent from a source to that host (Dohoo et al., 2010).

The cattle industry generates large volumes of by- and co-products like blood, bones, skin, trimmings, organs, viscera, horns, hoofs, feet, and skull among others during slaughtering and meat processing and these products must be treated and disposed ecologically (Lebelo et al., 2021). There are three categories of meat by-products based on their risk to human or animal health. Category 1 by-products are considered a very high risk because they include animals that could be infected with Transmissible Spongiform Encephalopathy (TSE) (Kappes et al., 2023).

Breeding and production

Animal breeding and production stage is the first stage at which beef safety problems are encountered during the beef cattle value chain, during production stage, animals could be directly or indirectly exposed to certain harmful chemicals, thereby causing harm to the animals (toxic effects) and if not cleared, may leave their residues in meat and meat products (Lebelo et al., 2021). The impacts of various chemicals, toxins, or residues of pesticides, antibiotics, drug, antimicrobials, heavy metals, and hormones in meats and meat products on the environment and human health is a major concern as unintentionally added chemicals that are man-made from livestock production and environmental contaminants like lead, mercury, arsenic, nitrates, and phosphorous have been documented to have negative impacts on environment and in-turn affecting human health (Ndukwe et al., 2023). These substances are chemical and biological in nature and can be introduced into meat and the environment by various technological practices which include residues of drugs used in treatment, incorrect meat storage and preservation and also and meat processing methods. (Olasoju et al., 2021)

Impact of unregulated use of drugs and chemicals on humans

Abuse of few antibiotics like penicillin has the potential to exert allergic reactions in sensitized individuals and toxicity such as aplasia of the bone marrow by residues of chloramphenicol. Residues of antibiotics which have ability to alter human gut microbial populations, and transfer antibiotic resistance genes to human pathogens has been reported, and the reasons for the presence of antibiotic residues in meat and meat products could be due to quackery, poor management, indiscriminate use of antimicrobials, extended usage or inappropriate dosages, violation of regulations regarding drug withdrawal period prior to slaughter, and above all, the lack of consumer awareness about the risk of human health hazards associated with antimicrobial residues consumed in meat and meat products (Olasoju, et al. 2021). Respiratory problems (such as throat pain, cough, and respiratory failure), cardiovascular problems (like carsiacarythmias), GIT tract (Nauseas, diarrhoea, vomiting, abdominal pain (Taiwo 2019,.Aiyar, Pingali 2020)

Impacts on environment

Environmental protection agency (EPA) information reports that; of the over 1 billion tons of pesticides used in US annually. This is 22% of the estimated 5.2billion pounds of pesticides used world-wide, where agriculture accounted for 80%, inappropriate use has resulted into intoxication of animals and or accumulation in meat and meat products. Organochlorine (OC), DDT, hexachlorobenzene, heptachlor, aldrin/dieldrin are mostly persistent in the environment and can cause health hazards which include neurologic and endocrine (hormone) system disorders, birth defects, and cancer. A case of highly toxic parathion that was used instead of trichlorophon was reported to have caused over 300 cases of poisoning and 3 deaths (Muncke et al., 2020)

Citing of abattoirs, slaughter houses and meat processing industry should be moved far away at distances above 100meters or more from residential areas. As harmful air pollutants and odour emanating from these facilities would be avoided. (Rajpalet al.2022)

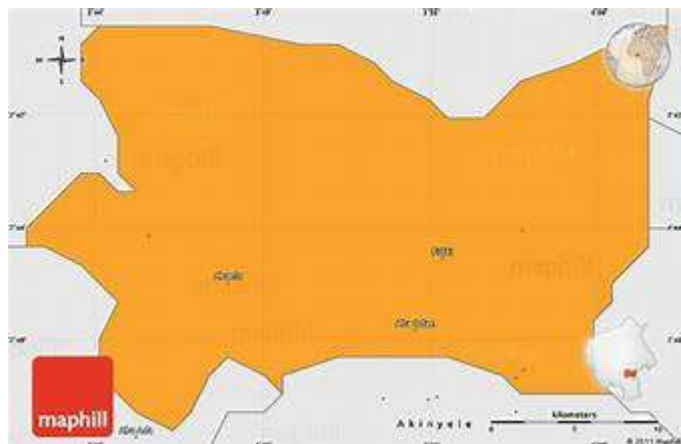
METHODOLOGY

Study area.

The study was carried out in Afijio local Government, Oyo State, Nigeria. Afijio is located within $7^{\circ}47'N$ of the equator and longitude $3^{\circ}56'E$ of the green, which is meridian and falls in the rain forest zone of Nigeria with land area of 916.7km of 188,900; Human population with annual population change of 2.3% (City population, 2022).

Afijio was purposely chosen as it has been evidently linked to several years of cattle survival and adaptability in the area and the typical favorable ecological niche being a derived Savannah zone. The area has experienced several decades of cattle production activities and been noted and equally identified primarily as one of the high potential for the cattle husbandry and production hub as well as live cattle markets. However, many clans have existed for decades in successive generation one after the other through a process called Fulani Sedentarization for several decades.

Afijio Local Government has 10 towns; this study was conducted in 3 purposely selected townstowns in Afijio local government area, Oyo state, Nigeria. These are Akinmorin, Ilora, and Awe. These towns within Afijio local government area harbor a heavy presence of herdsmen and pastoralists and contributes hugely to the cattle supply to the Akinyele live Cattle market and Amosun central Abattoir in Akinyele local government of Ibadan Oyo state, Obada live cattle market in Oyo town, Iseyin live cattle market; Also having few villages separating it from the Iwo town live cattle market of Osun State. Afijio is also one of the major local governments en route the north-central and northern regions of the country, and the selected towns are the closest major sources of live cattle supply to the abattoirs in cities of Ibadan and Lagos state.



Sampling method and sample size determination

A three multistage Random Sampling technique was adopted. Afijio was purposely chosen from the 33 Local Government in Oyo State owing to the fact that it harbors a heavy presence of herdsmen and pastoralists settlements actively engaged in cattle production and its proximity to live cattle markets and the central abattoir of the state. 3 Towns (Akinmorin, Ilora and Awe) were selected purposely within Afijio local government due to the reason of cattle being the cattle production hub of Afijio.

The Settlement Head served as key informant for a semi-structured interviewer-administered questionnaire to gather data about their knowledge and practices about cattle management and disease control. This guarantees ease of obtaining data as most cannot read and write. The reason for the choice of the Head (The Hakimi) as a key-informant was that each Head of the settlement has a few numbers of herders under him numbering about 5 to 10 with 30 cattle or more per herd. Since there are 3 towns, 10 settlements have been targeted per Town, and 1 respondent per settlement. The estimated size was 30 respondents.

A Self-made interviewer-administered questionnaire was designed to collect data on the Demographics of key informant respondents (The head of herders' settlements) and their practices in cattle health and management. It contained 20 open-ended and close-ended questions. Questions were designed and structured in accordance with the terms of reference of this study (handlers' practices in cattle production) which included husbandry management system, availability of veterinary services and management of sick and moribund animals. The use of key informant interview guarantees ease of obtaining data, as a settlement head (Hakimi) had 5-10 herders under him as he has been the one dictating and controlling the management and affairs of the herders and the animals. The fact that most cannot read and write was taken into consideration.

Data collected were summarized using Microsoft Excel 2019 and analyzed utilizing the Statistical Package for the Social Sciences (SPSS) software, v.22. To summarize the obtained data, the demographic characteristics of respondents were subjected to descriptive statistics (frequency and proportions)

Table 1: Demography of respondents

Variable	Frequency	Percentage (%)
Age (years) (N=30)		
Old age (60 years and above)	27	90
Middle adult (40-59 years)	3	10
Gender (N=30)		
Male	30	100
Education Level (N=30)		
No formal education	29	96.7
Secondary	1	3.3
Years of Experience (N=30)		
More than 20 years	30	100
Number of Herders Controlled (N=30)		
6 to 10	23	76.7
11 to 15	4	13.3
1 to 5	3	10
Number of Cattle per Herd (N=30)		
31 to 40	14	46.7
21 to 30	12	40
1 to 20	4	13.3

by older
nts had
an 201

Table 2: Harmful practices in cattle treatment

Traditional practices	Frequency	Percentage
Petrol plus salt	7	29.2
Calcium carbide	4	16.7
Lime	2	8.3
Procaine plus ethanol	6	25.0
Battery fluid	5	20.8
Total	24	100

The table above presents the harmful traditional practices used in cattle treatment and their frequency among respondents. Out of a total of 24 responses, the most commonly reported harmful practice was petrol mixed with salt, with a frequency of 7 (29.2%), indicating that it is the most widely used method despite its potential health risks to cattle. This was followed by the use of procaine mixed with ethanol, reported by 6 respondents (25.0%), and battery fluid, reported by 5 respondents (20.8%). These substances are dangerous because they can cause tissue damage, poisoning, and other severe health complications in animals.

The use of calcium carbide was reported by 4 respondents (16.7%), while lime was the least reported harmful practice with 2 respondents (8.3%). Although less frequent, these substances can still pose serious risks to animal health and product safety.

Discussion of results

These findings suggest that a significant number of cattle handlers still rely on unsafe traditional treatment methods, likely due to limited veterinary knowledge, lack of access to professional veterinary services, or reliance on indigenous practices. This observation aligns with the findings of Olasoju et al. (2021), who reported that inadequate knowledge among cattle handlers contributes to improper treatment practices and potential health risks associated with livestock management.

Participants mentioned various traditional remedies for treating cattle, including petrol mixed with salt, calcium carbide, lime, procaine with ethanol, and even battery fluid. These remedies indicate a reliance on non-conventional treatments, likely due to limited access to or trust in veterinary services (Osmaniet al.,2021)

One of the findings in this study was the reliance on traditional remedies for treating FMD, including potentially harmful substances such as petrol mixed with salt, calcium carbide, and even battery fluid. This reliance on non-conventional treatments was also reported by Osmaniet al. (2021) in Afghanistan, where some farmers used traditional methods such as standing animals in stream water or applying alum crystal to infected areas. Similarly, Muralidhar and Krishnan (2019) found poor vaccination practices among farmers in India, with many preferring traditional remedies due to limited access to or trust in veterinary services. These findings underscore the need for improved access to professional veterinary care and education about effective cattle management strategies.

Conclusion

91.7% of the respondents rely on traditional remedies for treating cattle, including potentially harmful substances (Petrol + Salt, ethanol + procaine penicillin powder, calcium carbide, and battery fluid) which has severe implications for food security and means of livelihood, as chronically infected cattle are transported to major live cattle markets in Iseyin, Akinyele, and Obada, potentially entering the human food chain.

Recommendation

Ministries of health and livestock as well as professional bodies should speak against and discourage harmful traditional remedies through education about evidence-based treatments, while simultaneously improving veterinary service accessibility in rural areas to reduce reliance on such practices.

References

- Aiyar, A & Pingali, P. (2020) Pandemics and food systems towards a proactive food safety approach to disease prevention & management. *Food Security*, 12, 749–756.
- Descriptive Study. *Animals*; 11(8):2188. <https://doi.org/10.3390/ani11082188>
- Disease amongst Pastoral Practitioners Adjoining the Bannerghatta National Park. *Vet Dohoo*, I. R., Martin, S. W., & Stryhn, H. (2009). *Veterinary epidemiologic research* (Vol. 2). VER Inc.
- FAO (Food and Agriculture Organization), (2016): Foot and Mouth Disease report.
- Farmers on Foot and Mouth Disease in Cattle in Baghlan Province, Afghanistan: A
- Fenner, F. J., Gibbs, P.J., Murphy, F.A., Rott, R., Studdert, M.J. and White, D.O.
- Kappes, A., Tozoneyi, T., Shakil, G., Railey, A. F., McIntyre, K. M., Mayberry, D. E., Rushton, J., Pendell, D. L., & Marsh, T. L. (2023). Livestock health and disease economics: A scoping review of selected literature. *Frontiers in Veterinary Science*, 10, 1168649. <https://doi.org/10.3389/fvets.2023.1168649>
- Lebelo, K., Malebo, N., Mochane, M. J., & Masinde, M. (2021). *International Journal of Environmental Research and Public Health*, 18(11), 5785. <https://doi.org/10.3390/ijerph18115785>
- Muncke, J., Andersson, A.-M., Backhaus, T., Boucher, J. M., Almroth, B. C., Castillo, A., Chevrier, J., Demeneix, B. A., Emmanuel, J. A., & Fini, J. B. (2020). Impacts of food contact chemicals on human health: A consensus statement. *Environmental Health*, 19, 1–12.
- Muralidhar, S., & Krishnan, A. (2019). Knowledge, Attitude and Practice of Foot and Mouth
- Ndukwe, M. K., Igara, C. E., Nkama, O. J., Ibe, C. O., Okoro, O. E., Nnnachi, E. O., & Atiaetuk, I. E. (2023). Effect of abattoir waste on surface water quality parameters of Iwofe River, Port Harcourt, Rivers State, Nigeria. *Journal of Geography, Environment and Earth Science International*, 27(9), 93–101. <https://doi.org/10.9734/jgeesi/2023/v27i9708>
- Olasoju, M.I., Olasoju, T.I., Adebawale, O.O. and Adetunji, V.O. (2021). Knowledge and practice of cattle handlers on antibiotics residues in meat and milk in Kwara State Northcentral Nigeria. *PLoS ONE*, 16(10), PP.e0257249.
- Osmani A, Habib I, Robertson ID (2021) Knowledge, Attitudes, and Practices (KAPs) of
- Rajpal A, Ali M, Choudhury M, Almohana AI, Alali AF, Munshi FMA, Khursheed A and Kazmi AA (2022) Abattoir Wastewater Treatment Plants in India: Understanding and Performance Evaluation. *Front. Environ. Sci.* 10:881623. doi: 10.3389/fenvs.2022.881623".
- Res (50), <https://doi.org/10.1186/s13567-019-0652-0>.
- Smith, J. E., Jr., & Gerba, C. P. (2005). Sources of pathogenic microorganisms and their fate during land application of wastes. *Journal of Environmental Quality*, 34, 42–48.
- Taiwo, A. M. (2019). A review of environmental and health effects of organochlorine pesticide residues in Africa. *Chemosphere*, 220, 1126–1140.
- Veterinary virology, Academic Press, New York, N.Y. pp 403–430.