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Combating the Silent Threat of Livestock Anthrax in Uganda: Issues and Challenges

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ABSTRACT

Anthrax is regarded as a zoonotic animal disease that tends to pose a threat not only to livestock but also to the global environment, economy, health and well-being of the general public. However, it suffices to state that Uganda has also had its fair share as it concerns the anthrax disease outbreak. Although the Anthrax disease seems to be silent, it is considered a dangerous livestock disease that could gradually creep persistently and have a significant impact on the Uganda livestock, environment, and the general well-being of the people of Uganda. It is in this regard, that this study tends to examine the legal framework concerning combating anthrax disease in Uganda. Furthermore, the study also aims to examine the danger, root cause, issues, and challenges in combating anthrax disease in Uganda. In this regard, the study adopts a doctrinal method of study to examine previous literature and other relevant sources concerning anthrax disease in Uganda. The results obtained from these sources were analyzed through an analytical and descriptive method. The study therefore found that there is an incidence of anthrax disease in Uganda. Furthermore, the study also found that lack of awareness, non-vaccination of livestock against anthrax disease, and poor surveillance against the anthrax disease could result in the widespread of the anthrax disease, which may pose a significant threat to livestock, the environment, and the public health well-being of Uganda. It is therefore concluded and recommended that to curtail the silent threat of the anthrax disease, there is a need to strengthen and intensify the legal regulation, surveillance, and control of the anthrax disease. Furthermore, it is also required government and various stakeholders ensure an effective engagement and collaboration with the local agricultural community in curtailing the outbreak of anthrax disease.

Keywords: Legal, Livestock, Anthrax, Agriculture, Uganda

INTRODUCTION

Agriculture involves the breeding of livestock, plants, and cash crops for commercial and subsistence within the global environment [1, 2] Agriculture is considered a mainstream of income generation and occupation globally, which humans survive on for a living. However, it suffices to state that livestock (which includes sheep, goats, cattle, pigs, and poultry) is one of the most reliable agricultural products that the global community depends on for meat, milk, hide and skin, and other agricultural products [3]. These products aid in enhancing food production and the economic well-being of the global environment. However, despite the benefits of agricultural products it suffices to state that several challenges could negatively impact livestock production and human consumption or reliance on this product. One of such challenges involve infectious and contagious diseases on livestock [4]. For decades there have reported cases of severe contagious disease that often infect livestock that could also be dangerous for human to consume. It suffices to state that Anthrax is one of the notable diseases that is consider a livestock infectious and contagious disease that is also a threat to humans when consuming the products from livestock infected with the disease. Anthrax is regarded as a disease caused by bacterium bacillus anthracis that often results in infected livestock suffering from critical respiratory disease, and skin irritation and could lead to the death of the livestock [5]. Goats, cattle, and sheep are the major livestock that are mostly affected, it could be transferred from animal to human through direct contact or consumption of livestock products.

It must be noted that anthrax is considered a zoonotic disease that affects the global environment and it is a concern in various parts of the world. This is concerning the fact that it remains a danger in regions where the disease is endemic or during outbreaks. In this regard, Uganda rich in livestock

production has also had it fair share of the anthrax disease [4]. The outbreak of anthrax in Uganda is said to have occurred in western Uganda in the 1950s which resulted in the loss of livestock. In 2010, 2011, and 2022, the anthrax disease was recorded to have occurred in Sheema, Kabira sub-county, and Kyotera districts respectively. The outbreak of this disease led to the death of several livestock and a severe impact on humans [6]. Although, the timely intervention of the Uganda government tends to further curtail the spread of the anthrax disease. However, given the fact that anthrax disease could exist in moist soil and spike more during drops in temperature, rain season, and flooding areas, could pose a silent threat to the Uganda community that is characterized- by this kind of climatic condition [7, 8]

Concerning the above, it suffices to state that anthrax does not only pose a threat to livestock but have a considerably negative impact on the Uganda economy and public health [6]. In this regard, in ensuring livestock economic stability and protection public health, requires adequate measures from legal, medical and socioeconomic safeguarding. This is concerning the fact that these measures will continue to inform the general public to be alert on the silent threat and disaster anthrax disease could cause to the human population, animal and economic wellbeing [10].

It is concerning the above that this study tends to embark on a cursory examination on the issues and challenges that could the combating of the anthrax disease in Uganda. Furthermore, the study also sought to propose possible solutions to these issues and challenges.

METHODOLOGY

To achieve the aim of this study, a doctrinal method of study was adopted. The essence of adopting the doctrinal method of study is aimed at theorizing and conceptualizing the anthrax disease and its silent threat to the Uganda environment. Furthermore, to also ascertain the appropriate legal and possible socio-economic method in combating the threat of anthrax disease. In this regard, primary and secondary sources of material such as laws and scholarly literature were relied on. In this regard, the data obtained through this medium were analyse and examined through a descriptive and analytical method.

Understanding Anthrax, it Outbreak and Transmission Pathways in Uganda

Anthrax is a severe infectious disease caused by Bacillus anthracis, Anthrax is a dangerous bacterial disease. The Centre for Disease Control and Prevention (CDC) lists it among the zoonotic diseases in the Bacillaceae bacterium family [3]. These are infections like zoonoses according to the World Health Organisation because they can be spread between man and animals which have backbones. For instance, fungal organisms, bacteria, viruses, or parasites can lead to these infections. Human beings can also contract these animal-transmitted diseases easily hence it is a serious public health issue. Consequently, epidemics and pandemics may follow such transmissions of diseases [10, 9, 8]

From the 1950s to present day there have been several cases of anthrax outbreaks in the area surrounding Queen Elizabeth Protected Area in western Uganda. Meanwhile, sporadic outbreaks were also reported for this same location between 2004 and 2005 and then sometime around 2010 when over five hundred wild animals and four hundred domestic animals died [11]. Sheema, another district in Uganda was affected by the spread of the disease in 2011 leading to the closure of local markets and the deaths of two persons and several animals. Further outbreaks were reported in 2022 and in Kabira sub-county, Kyotera District in 2023 [12], although the impact was less severe as a result of the early detection preparedness and response initiatives implemented by the government of Uganda. The significant impact of these measures in curbing the spread of the disease in recent times cannot be overemphasized [6]. Anthrax tends to reach its peak during January and February following a drop in temperature. However, according to the public health institutions in Uganda, they raise and establish early warning systems for disease outbreaks across Uganda. By using data on rainfall patterns, floods, temperature patterns, soil conditions as well as animal illness cases together with patterns of infectious disease outbreaks, the institutions have made impressive progress in the control of the disease [2]. Through their implementation of an early warning approach, the public health institution has reported a reduction in time for detecting anthrax outbreaks in the Mbale region from sixty-four days to two days between 2022 and 2023 [13, 14]. It is expected that with sustained efforts from all stakeholders, the time can be shortened, leading to greater success in the fight against the disease.

Anthrax has several pathways for transmission and there are high risk factors of the transmission that makes it more harmful. Consequently, there are five transmission pathways and risk factors that enable the transmission of anthrax and they include animal and direct contact, inhalation, ingestion, environmental exposure, and use of anthrax as a bio-weapon or in a bio-terrorist attack [4]. Due to its status as a zoonotic disease, anthrax can be contracted from human interaction with infected animals or their derivatives. As a zoonotic disease,

anthrax can be contracted by humans through direct contact with infected animals or their products. This can take place at different stages of animals lives, such as during their harvest or processing. Among the domestic livestock groups, like cattle, sheep, and goats, such diseases as anthrax become especially prominent. In contrast, in the case of inhalation anthrax, when these particles are inhaled, the spores are more likely to find their way inside the lungs [5]. On a professional level, it usually takes place in agricultural zones, workplaces with infected laboratory animals, or in industrial sites where there is trade in animal products. However, when it comes to inhalation, anthrax can be the most serious because of the higher infection rates it causes.

Eaten undercooked or contaminated meat of healthy animals during outbreaks may lead to gastrointestinal anthrax, especially in areas, where anthrax is endemic, and food safety is of low standard. Having that in mind, it is crucial to note that this mode of transmission is especially problematic because communities that fall sick will also experience food shortages [2, 14, 15]. Therefore, starvation is likely to become the greatest challenge for many of them and it is likely to deter their eating habits, especially for the poor. In known cases of anthrax outbreaks, the spores have been found to exist and remain active in the environment for extended periods. The presence of anthrax spores in soil, water, and in objects that had contact with contaminated materials (especially in areas where anthrax has previously occurred), is the primary cause of disease outbreaks [16]. They can spread contamination onto food products, and eventually to people. Above all, there is the chance of Anthrax spores being used as a bioterrorism weapon which could lead to exposure to risk via contact or inhalation of contaminated objects.

Humans contract anthrax through direct or indirect contact with infected animals or their products. In humans, there are three main forms of anthrax namely: cutaneous, inhalational, and gastrointestinal which have different modes of transmission [17]. Cutaneous anthrax is the most common type in humans and occurs when people come into contact with infected animals or their products especially when they handle contaminated hides, wool, or meat. Inhalational anthrax happens as a result of inhaling spores of Bacillus anthracis that are encountered in settings such as agriculture or laboratories when there is industrial exposure to infected animals or their products. On the other hand, gastrointestinal anthrax arises from ingesting raw or undercooked meat from infected animals causing a gastrointestinal infection [9].

Anthrax bears historical significance as a zoonotic disease that still remains a concern in various parts of the world over time. While cases of human anthrax are relatively rare in developed countries today, it continues to pose danger within regions where it is endemic or during outbreaks. Thus, governments and healthcare providers worry about malevolent use of anthrax spores as a weapon for bioterrorism which equally raises global awareness for the disease. As a consequence, understanding the nature of anthrax is imperative for the implementation of effective surveillance, prevention and control measures necessary to prevent risks associated with the disease [17, 15, 18].

Symptoms and Impact of Anthrax on Animals and Rural Communities

Laboratory samples from infected animals or people and particular symptoms they exhibit can also indicate anthrax. Some clinical signs that point to anthrax in animals include rapid illness with weakness, fever, and difficulty breathing. Animals suffering from the parachute form of anthrax manifest severe tissue swelling, particularly in the throat and neck [19]. The condition is characterized by rapid death, even before the manifestation of clinical signs. Livestock - cattle, sheep, and goat - are mostly at risk for anthrax. By and large, anthrax in animals leads to a fatal outcome, with outbreaks sometimes registering 90% mortality. This translates to significant financial loss for livestock owners and communities involved in agriculture. The presence of anthrax in animals presents a risk of disease transmission to humans who come into contact with the animals or their products [20].

Cutaneous anthrax is the most common form of anthrax among humans. It manifests with the appearance of skin lesions, mainly on the site where the spores entered the skin, similarly to being in contact with animal products contaminated with anthrax, such as hides and wool. Inhalation form manifests in the first few days with flu and cold-like symptoms with fever, fatigue, cough, and mild chest pains [21]. However, these symptoms often progress rapidly and deteriorate within 2-6 days, so the patient falls into acute respiratory distress and shock. During outbreaks, it is vital to avoid the consumption of undercooked meat from infected animals, as this cause develops into gastrointestinal anthrax. Gastrointestinal anthrax manifests with nausea, vomiting, abdominal pain, and damage due to severe diarrhea. In the most severe and rare cases, it can lead to meningitis and septicemia, with the associated neurological symptoms of confusion and shock. These can become fatal without timely medical intervention [22]. Anthrax outbreaks or incidents of bioterrorism have a profound effect on the psychological and social well-being of those involved; consequently, it gives rise to fear, worry and public health apprehensions. Knowing animal and human anthrax signs and consequences is vital for early diagnosis, proper medical intervention, as

well as prevention strategies that would mitigate infections and transmissions [23].

There is a lot of complexity and a very important impact from anthrax on livestock farming and rural communities, which affects the economy as well as social aspects of communal life. Some of the main economic impacts arise from animal death that results in heavy financial losses for farmers due to loss of valuable animals. Even in situations where animals survive, they may exhibit reduced productivity including low milk yields, weight loss and decreased fertility thereby causing low farm earnings. Moreover, anthrax outbreaks can elicit trade bans by local or international authorities leading to interruptions to livestock movements and movement of animal products hence affecting market access and farmers' income streams [23]. Additionally, farmers incur extra costs for disease control activities like veterinary services, disinfection measures, dumping infected carcasses into caustic pits, vaccination campaigns, as well as other measures.

The farming of livestock is a primary source of revenue and livelihood for farmers in many rural communities. Consequently, outbreaks of anthrax pose a great danger not only to farming activities but also to the existence of farming families [24]. It is a known fact that in communities where anthrax is reported, such outbreaks negatively impact food security and results in reduced livestock productions. Furthermore, these outbreaks cause disruptions in entrenched cultural and traditional practices associated with livestock rearing, with the consequent emotional distress amongst affected communities. Public health concerns at such times equally contribute to fear and anxiety amongst these communities more so when there is a likelihood of risk of transmission to humans or other animals [25].

As is evident from previous occurrences that the effect of anthrax on livestock farming and on agricultural communities after an outbreak can be devastating. The consequences which may transcend economic and social factors equally pose public health implications. Anthrax outbreaks often times result in economic losses such as livestock mortality and loss to trade restrictions as well as limited access to local and international markets, eventually leading to reduced income and earnings [26]. Above all, the costs around the management of the disease, for instance, the implementation of control measures, exacerbate the burdens already faced by farmers, ultimately affecting their revenue. Worse still, failure to effectively manage the outbreak may result to decline in livestock production and the consequent decrease of animal products both for consumption and sales.

Aside the above, there are other negative ramifications of anthrax outbreaks for rural communities [27]. Considering the zoonotic nature of the disease, the public health risk posed by it often strains healthcare systems in affected rural areas, thereby requiring resources for diagnoses, treatment and surveillance for both animals and potential human cases. Moreover, the dread of anthrax outbreaks create apprehension, stress, public health concerns and disruptions of economic activities within rural communities leading to imbalance in the psycho-social well-being of members of affected communities.

Legal Regulation in Curtailing the Outbreak of Anthrax Disease in Uganda

Anthrax is one of the global endemic diseases common to mammals especially herbivores animals in some parts of South- Europe, North and South America, Africa, Australia, and Asia countries [28]. The effect of this disease is not only felt by animals alone, it also affects humans and it has reportedly led to the death of many. This disease has been projected to be a worldwide distribution and is transmissible from vertebrate animals to humans [29]. Anthrax disease is caused by the soil-borne spore-forming bacteria called Bacillus anthracis and more than 95% of anthrax cases in humans are a result of poor handling of or contact with infected animals or their products such as hide, bones, hair, meat, and also the carcass by human. Anthrax disease has a very strong resistance to heat either from sunlight or man-made, delayed period, and to many disinfectants, this makes it very difficult to cure whenever the outbreak is experienced by humans.

The relationship between humans and their environment and the need for survival which includes dependence on animals and livestock has compounded the risk and management of anthrax disease over time. Anthrax diseases are rampant in both the hot and humid periods of soil because, after successful sporulation of the bacteria they are very resistant to harsh environments, and most times, the pathogen can survive without a host over some time [30]. As a result of human interaction with soil due to cultivation and other essential activities of man, this pathogen can be contacted and makes the body of humans a host. This usually happens when there is an interaction between humans and infected animals or their carcasses on the soil cultivated by humans because the disease is highly contagious and fatal. This disease is characterized by a reduction in human and economic resources due to low productivity as a result of the death of humans and animals [31].

The effect of anthrax disease is so severe that it can kill an animal within the space of 48-72 hours due to a bleeding reaction from the nose, mouth, and anus without clotting. Reports showed that in the first

half of the 20th century, the World Health Organization reported 20,000-100,000 cases concerning human and livestock. The major hosts of this anthrax disease are sheep and cattle. This is because they can easily contact anthrax while grazing or during consumption of leaves infected with anthrax spores [32]. When these animals are infected, anthrax spores will spread through their body and as a result, their urine, faces, other waste, vegetation, and the surrounding soil will be contaminated and dangerous to other animals and humans. Anthrax disease can infect human beings through four major ways which are; inhalation, cutaneous, intravenous, and gastrointestinal. Animal products such as meat, milk, skin, and so on consumed by humans daily can also be a source of contracting anthrax disease from animals and humans can also spread anthrax when having contact with one another and more especially through insect bites such as bugs [33]. Other means of being infected can be associated with human attributes, in the sense that anthrax can be used as a bioterrorism weapon. A good example of this was experienced in the year 2001 in the United States where over 30,000 people were exposed to anthrax spores which were distributed through the mall and resulted in death and other infectious diseases [31]. Some countries are subjected to a high risk of anthrax diseases which affect the standard of living, health, and economic power of their citizens. Report shows that anthrax diseases is more prevalent is Asia and Africa. One of the major ways to prevent the spread of anthrax is to impose standard laws, rules and regulation from a competent authority. Ugandan is of the few African countries that has been able to put some laws in place to guide against anthrax disease and for the protection of the citizens. Part of the laws enacted by the Ugandan government to protect the citizens are; Animal Diseases Act Chapter 38, 2006; Cattle Grazing Act, Chapter 42, 2000; Animals (Straying) Act, Chapter 40, 1922; Animal Breeding Act 2001; Agricultural and Livestock Development Fund Act. It is essential to discuss few of the sections in the laws aimed and protecting people from Anthrax disease

Animal Diseases Act is one of the major provisions enacted for the control and protection of citizens against anthrax disease. Section 2 of the Act provides that diseases animals should be separated, tied up or put in a kaal and the owner should immediately make a report to veterinary officer or any other administrative officers set up for such a purpose by the government. With this provision, the Ugandan government would be able to control and impose a duty on anyone in possession of diseased animals to separate them from others and make a report. Section 3 stipulate that the veterinary officer who has been informed about the affected animal has a duty to takes necessary steps to ascertain the existence of the outbreak and immediately report to the commissioner of livestock and entomology. The commissioner is a representative of the government and as such, it would be easier to bring the notice of such to the Ugandan government for immediate action. In an effort to prevent the spread of anthrax or other form of disease amongst animals, the Act provided that the administrative officers in charge of districts have to duty to notify farmers in their area of any outbreak of any diseases for the purpose taking measures to prevent the outbreak, this is as stipulated in section 4 of the act. It is also important to state that the Ugandan government is concerned with the protection of her citizens from diseased animal. In an effort to achieve this, the section 5 of the Act provided that the administrative or veterinary officer in charge can direct that animal affected, infected or exposed to diseased be slaughtered to prevent an outbreak of such a disease to other animals and humans.

In order for the administrative and veterinary officers in charge of animals especially the diseased ones to carry out their duties effectively and efficiently, section 7 of the Act gave them some power. One of these powers is to direct that any animal died of disease should be safely disposed through burial, burning or other means of destruction including their cases, wool, skin, hides and other animal products that could be obtained from them. In addition to this, the officers have the power to inoculate and use disinfectant in the areas suspected to be affected by infected animals to prevent outbreak, reoccurrence and spread of all animal diseases anthrax inclusive. However, section 9 stipulate that where some animals are suspected to be infected or affected, the officers have the power to carry out various tests including blood test and diagnose such animals for the purpose of safety for other animals and humans. Further to this powers, section 10 of the act allows the Commissioner of livestock and entomology to prohibit the slaughter of cattle for sale, consumption of its products including its carcass from any place for the purpose of preventing the spread of the diseases for the protection and prevention against animal diseases such as anthrax. A thorough inspection is require for the purpose of sanitization and prevention of outbreak of disease, hence, the officers has the power to enter and land or premises, carriage or container carrying or containing animals, its products and carcass for the purpose of ascertaining whether such animals or their products are infected or capable of transmitting any infection or diseases with the aim of cleansing and disinfecting such land, premises, container or carriage as stipulated in section 12 of the act.

Since consumption of animal products is one of the ways of spreading anthrax disease, section 11 of the act aimed at preventing such by empowering the Commissioner of livestock and entomology to restrict people from slaughtering any infected animal for sale or consumption including the carcass to prevent the spread of animal diseases. Further to this, owners of animals and animal products have the duty to bring their products for inspection before a veterinary officer or inspecting officer who are empowered by section 13 of the act to perform such duty. In order to perverse the economic rights of the owners of animals and animal products, the Ugandan government made provision for support especially where animals are slaughtered due to contagious disease. Thus, section 15 of the act provides for payment of compensation by the Ugandan government to any person whose animal has been slaughtered due to infectious diseases and such payment will be at the current market value after being assessed by the veterinary officer. However, a person may be denied compensation if such a person has violated or breached any of the Laws, rules, or regulations provided in section 16 of the Animal Diseases Act and other related legislations. This serves as a control measure to avoid abuse from the animal owners concerning compensation.

Poor environment, soil, and vegetation contamination are part of how anthrax diseases are transmitted and as a result, there is a need for the Ugandan government to look into it. To create and protect humans and animals from a volatile environment, section 17 of the Animal Disease Act allows the Minister responsible for livestock to declare any area within Uganda as an infected area. This protects the humans and animals around us from being infected with diseases. In other to achieve this declaration, some rules are put in place to regulate the conduct of individuals in connection with animals. Some of the rules are; no one is allowed to move any animal carcass from such infected areas without the written permission of the Commissioner of Livestock and entomology; no animal is allowed to be moved from such an area without being previously disinfected; all animals in such area must be kept far from the public road; owners of animals may be directed by the Commissioner of livestock and entomology or the veterinary or investigative officers to move their animals from the infected area to another saver place; owner of animals in the area declared as infected may be required to mark their animals or its carcass for the purpose of identification, safety and prevention of spreading the diseases and the carcasses of all animals that died of diseases to be buried not less than four feet below the earth surface or be completely burnt, as stipulated in section 18 of the Act. No citizen shall be allowed to rely on an excuse that an infected animal escape from such an infected area and as such, the owner of such escaped animal shall be held responsible for negligence. Part five of the Act comprised of sections 20 and 21 made provisions for rules and when such rules would be applicable. The rules are applicable to wit; the control, removal, isolation; disinfection; slaughtering of an infected animals; burial or disposal of remains of animal, importation and exportation of animals; its products and carcass; prohibition of movement of animals and its products with Uganda; quarantine of imported or diseased animal to be under a close monitoring; cleansing and is infection of areas for sale of animals such as markets and auction places, prohibition of movement into the areas infected or with existence of tsetse flies and prescription of charged and fees for the purpose of inoculation, disinfection, examination, slaughtering of animals and recovery of payment expended or inquired by the Uganda government under section 21 of the act.

It worthies of note that legal issues that may arise as a result of the provisions of this Act are provided for in the Part seven of the Act. This part put some legal measures in place to enforce compliance among the citizens of Uganda. For instance, section 23 of the act makes it an offence for anyone to directly or constructively obstruct any officer from carrying out their official duties as provided for in Part three of this Act and any attempt to do such can lead to an arrest without warrant. Section 25 stipulate that any person who fails to abide or obey the provision of this Act without any satisfactory reasonable would be held liable to be committed to prison for a period not exceeding 12 months or pay a fine not exceeding six thousand shillings or both depending on the gravity of the offence committed. In addition to this, administrative officer, veterinary, investigation or police officers are allowed and permitted to stop and detain a person who has violated the provisions of the Act, and where such a person detained could not adduce satisfactory evidence such a person can be arrested without a warrant. Section 27 of the act stipulate that in a situation where some animals escaped from the infected areas, such animals can be seized for examination of their body or carcass and where such seizure is made, it must be reported as soon as practicable to the magistrate having jurisdiction within the area where such an animal is seized. The provisions of the Animal Disease Act in Ugandan have been able to curtail the outbreak or spread of infectious diseases such as anthrax against humans and animals in Uganda.

It must be noted that the Cattle Grazing Act Chapter 42, 2000, is a legislation made by the Ugandan government is aimed at preventing an outbreak of Anthrax and other types of disease. Grazing is one of the ways to contact anthrax.

Where a particular area and its vegetation are infected, animals grazing thereafter would also be infected. The Act is to regulate the conduct of the animal owners concerning grazing. Thus, section 2 of the Act prohibits anyone from allowing his or her cattle including the ones under his or her control to graze in prohibited areas signified by the veterinary officer for the prohibition is in force. By section 2(2) of the act, the veterinary officer can prescribe for safety the number of cattle that can graze in a particular area and the number of cattle an individual may be allowed to graze, this is to prevent an outburst of infection and easier control measures to limit the risk of infected animals. Furthermore, the veterinary officer has the power to impound any cattle on a restricted land in contravention to the provision of section 2 of this Act, and where such cattle are not claimed by the owner within six days, the veterinary officer or the district administration officer may sell such cattle and the proceed would be disposed by the direction of the Minister. However, section 3(2) of the act stipulates that where such cattle are claimed before the expiration periods, the owner of the person in charge of such cattle may be required to pay a fine and where such a person fails to do so, the cattle impounded may be used as a security for the payment of the cost incurred as a result of the impounding. Section 6 of the act stipulate that where anyone fails to comply with the provisions of this Act, such a person shall be liable upon conviction to the payment of fine not exceeding one thousand shillings or be imprisoned for a period not exceeding six months or both as court may direct.

Straying animals can cause havoc in an area especially where such animals are dangerous or infected with diseases such as anthrax. In this regard, the Animals (Straying) Act Chapter 40, this Act serves a control measure for grazing, hence the administrative, veterinary, inspecting and police officers are allowed by this Act to seize straying animals or such animals believed to have been abandoned by their owners and where such seizure is carried out such must be reported to the magistrate having jurisdiction over where such animal is seized, as stipulated in section of the act. In addition to this, where a straying animal is seized and the Magistrate is satisfied with the evidence on oath that the owner cannot be found, the magistrate can make appropriate order as he or she dim fit in such a situation. Section 1 of the act stipulate that in the alternative where the owner is found, the magistrate can make an order of release of such an animal to the owner upon the payment of all expenses incurred on the animal from seizure to release.

Animal breeding and production are part of the sources of economic power in most African countries and as a result, it is import to regulate the sustainability of production of animals in the society. Animal Breeding Act 2001, is one of the laws meant to protect human and animals and also prevent the spread of disease at different levels. Section 4 of the act established the office of the Director of animal resources and saddled the person in charge with some duties part of which are to: maintain efficient implementation of sustainable increase in farm animal production; prioritize animal breeding and research with policies; improve the national base food and security through an increase in production of animals; optimize the animal genetic resources in line with Uganda's environmental protection; improve farm animal product for exportation; formulate, implement and enforce regulations and guidelines concerning breeding, semen processing and storage; genetic material and marketing for both importation and exportation. In order to have adequate record keeping for proper monitoring of animals, section 11(1) of the act mandates the Commissioner, Animal Production and Marketing to set up a record keeping mechanism for breeds and adequate passing of information concerning payment on: inseminator; semen collection; inoculators; hatcheries; breeders and other ways of improving animal production. In addition, section 12(1) of the Act gave additional responsibilities to the Commissioner, Animal Production and Marketing part of which are to: oversee policies on animal production; training of farmers; monitoring animal production with good prospective animal marketing strategies. The commissioner in charge of livestock, health and entomology is also expected to: prevent and control an outburst of diseases; create and maintain areas free of diseases; monitor the performance of the veterinary officers; gives permits on importation and exportation of animal breeds and genetics etc. Furthermore, the office of the Commissioner for Fisheries Resources is expected to: provide policies to guide fish production; train fish farmers, monitor the activities of fish production and its products for marketing, issue permits to both exporter and importer of fish breeds and genetic materials. This law is aim at preventing production of harmful animals for consumptions and dumping of infected breeds of animals through importation thereby serve as a means of diseases control in Uganda.

Agricultural and Livestock Development Fund Act Chapter 233 2002

The Ugandan government is committed to support the livestock farmers in order to have better and healthy productions through various loan schemes. In this regard, Agricultural and Livestock Development Fund Act Chapter 233 2002 was enacted by the Uganda government. Section 2 of the act established Agricultural and Livestock Development Fund as a corporate body with a seal

created for the purpose of buying, managing, disposing and holding properties as may be deem necessary. The functions of the fund is clearly expressed by the Act among which are to: advance loans to the farmers in Uganda for the purpose of improving agricultural and livestock industries; ensure adequate repayment of the loan when it is due; ascertain that the loan obtained are used for the purpose of collection; assist the agricultural and livestock farmers meet up with best standard in terms of their produce, ensure and assist the farmer is keeping good record of the inflow of their productions; assist in creating various schemes to improve the production of seeds for crops and breeding of livestock for maximum output and so on. Section 11 of the act directs Agricultural and Livestock Development Fund to advance loans to the agricultural and livestock farmers to improve their production with friendly terms with respect to the interest, repayment and security on cost as may be considered appropriate by the Agricultural and Livestock Development Fund. This Act with the help of Ugandan government has been able to give many farmers a breakthrough with adequate increase in production of healthy animals for breeding and consumption. The Act is equally helpful in eradicating the production, management, distribution and consumption of diseases animals or their product which can lead to diseases such as anthrax. In Uganda.

Issues and Challenges in Combating Anthrax Disease in Uganda

Effectively combating anthrax outbreaks is essential in preventing the damaging impact described above. Unfortunately, diverse issues and concerns in Uganda have hindered such efforts. One of the primary challenges in Uganda relates to limited community awareness, ineffective public health programs, and deeply ingrained cultural beliefs and practices.

There is also sufficient evidence to show that unavailability of information and knowledge regarding the disease is widespread among affected communities in Uganda, most especially as it relates to its clinical manifestations, modes of transmission, and preventive measures [4]. This situation poses a clear challenge in the fight against anthrax in that delayed detection, prevention, as well as swift response to outbreaks impact effective monitoring and intervention.

One other challenge, which is equally common in most African rural communities, is the shortage of programmes related to public health in Uganda [11]. This is most prevalent in the Arua district of the country. Inadequacy of basic and effective public health programmes impede the implementation of efficient measures to address anthrax outbreaks. Consequently, needed responses such as sensitisation efforts, surveillance mechanisms and appropriate interventions are not sufficient. Most significant also is the role played by cultural beliefs and practices in finding adequate solutions to the malaise in Uganda. Issues related to communal herding, consumption of dead animals, interactions between wildlife, livestock and humans, as well as traditional rituals related to burials have also been identified as major contributors to the risk of outbreaks. All these factors bring to the fore the multifaceted sociocultural dimension of the challenge.

Other factors which may be classified as secondary such as limited access to vaccination and treatment, unsafe practices and occupational hazards and inadequacy in disease surveillance and reporting, equally pose peculiar challenges in combating anthrax outbreaks. For instance, there is limited information and knowledge about the availability or accessibility of anthrax vaccines and treatments amongst residents in affected rural communities. This information gap hampers the ability of dwellers to constructively protect their livestock and prevent human infections thereby perpetuating the prevalence of outbreaks of anthrax.

Another factor worthy of mention is unsafe practices and other occupational hazards which are evident in the business of butchers, slaughter-men and herdsmen, as well as the consumption of meat from infected animals raise challenges in the fight against anthrax. These age-old practices often contribute to the transmission of the disease and also impede its effective control.

CONCLUSION

Concerning the above, the study has been able to address the issues of anthrax has been a global disease that is serious threat to livestock and human. The study has been able to address the conceptual issues as it concern anthrax that is consider a zoonotic disease that is cause by bacterium bacillus anthracis that often result to infected livestock suffering from critical respiratory disease, skin irritation and could lead to the death of the livestock. Furthermore, the study also observe that Uganda had also had it fair share of the livestock disease. Though, the government and other relevant had institutions had taken preemptive measure in curtailing the incidence of this zoonotic disease, but it a major livestock disease that tend to pose a silent threat to human and livestock. This is in regard to the fact that is a livestock disease that tend to be contagious and have a high transmission pathway that are may not be ascertain or very common. Furthermore, the study also identify that the Uganda have several legal framework concerning the regulation, protection and curtailing of livestock disease. However, given the nature of the anthrax

disease, it seems to pose a silent threat to livestock and health of the entire population of Uganda.

Recommendation

In this regard, it suffices to state that, a holistic effort towards addressing these complex challenges is required in decisively combating anthrax disease in Uganda. Engaging in community sensitization, improved public health programmes, advocacy in health-efficient cultural practices, increased access to vaccination and treatment, implementation of occupational safety measures as well as adequate disease surveillance are critical in order to mitigate the impact of anthrax outbreaks and protect human and animal populations in Uganda.

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