



**Animal Markets
and Zoonotic Disease
in Ghana**

COUNTRY SUMMARY: GHANA

CULTURAL CONTEXT

Ghana is a small, heavily populated West African nation along the sub-Saharan southern coast, bordered to the west by the Ivory Coast, the east by Togo, and to the north by Burkina Faso. Livestock (such as cattle, sheep, goats, pigs), birds (chickens, turkeys, guinea fowls) and wild animals (grasscutters/cane rats, deer, and bats) are commonly eaten across much of Ghana. Dogs and cats are generally regarded as household pets, as are monkeys. Ghana has a well-established open-air market tradition. Culturally, live animal and animal product markets are part of a livelihood that is fundamental to the tradition and customs of the area. Animal markets are a primary source of income for some, a secondary for others, and serve as a ground for social interaction where traders and others build strong social bonds and community linkages for mutual benefit, providing ground to discuss clan and family issues.

ANIMAL MARKETS

Animal markets in Ghana take several forms: some sell only live animals; others sell live animals and meat or other animal products, and include abattoirs and other general goods. Markets that sell cattle, goats, sheep, poultry, and small ruminants, are open air with little biosecurity. From these markets, animals may be moved to other markets or into homes, restaurants or chop bars, and hotels, where they are processed for food. Some are kept as pets, others used for religious purposes. Roadside wild meat stands are common, and the trade is informal. Rare species can sometimes be found for sale, including meat from crocodiles, bats, gorillas, and monkeys. Alternatives to markets are cold stores, where frozen meat and meat products are sold. Demand for frozen alternatives has steadily increased over the years.

DRIVERS OF ZOOONOTIC DISEASE RISKS

There is risk of disease transmission at all stages of animal handling, especially at the point of slaughter, but concerns about hygiene measures, enforcement, and compliance exist along the value chains for both livestock and wildlife. During transport, animals from various locations are crowded densely together in trucks, minibusses and taxis, sometimes for days. At markets, particularly those with abattoirs, animals and humans interact with little sanitation or other precautions in an environment that is dense and crowded, providing ample opportunities for the spread of pathogens. Despite this, many market stakeholders believe disease risk occurs primarily at habitat sites, not later when animals are killed or processed at markets. Bushmeat sales take place along roadsides often without consistent locations and with dynamic, itinerant, and opportunistic vendor presence. While hunters typically reside in rural communities, they increasingly cater to urban buyers who can afford higher prices and stop to purchase wild meat along motorist routes. Livestock supply chains are not always formalized, and individual actors

can bring their animals to slaughterhouses to be processed.

RISK MITIGATION AND RELEVANT CHALLENGES

Numerous laws govern animal markets, but public awareness is lacking. There are conflicts between institutions regarding their roles and responsibilities. Due to overlapping duties and unclear roles, regulation and enforcement can be lacking. In some cases, the laws themselves are unclear. In part because of these regulatory and quality-assurance limitations, some Ghanaian animal products command lower prices on the international market. Animal and animal product sellers and processors resort to a variety of means to bypass regulatory standards, and in many cases, these transgressions go unnoticed. Producers must pay for inspections, incentivizing non-compliance. Often, animal markets operate outside the law (e.g., slaughtering and butchering take place in homes without animal health or environmental health inspectors present). Reforms such as a clearer definition of the roles of various regulatory institutions, proper enforcement of existing regulations, and making animal and animal product inspection free and compulsory, could help to mitigate the risk of zoonotic disease transmission. Quarantining of new animals could be more strictly enforced to enhance biosecurity. Additional public education about hygiene and disease-mitigation measures is urgently needed.

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INTRODUCTION & OVERVIEW OF APPROACH

Coordinated by Amos Laar, PhD. of the School of Public Health, University of Ghana, in late 2020, a team of nine field researchers simultaneously visited Greater Accra, Central, Volta, and Upper East of Ghana to interact with key informants and stakeholders including relevant government Ministries, Departments and Agencies (MDAs), non-state actors, and individual farmers/hunters. The coordinator and field team were supported by two administrative/clerical staff. Interview responses have been left in full response form, modified only for clarity.

Key Informants/Stakeholders interviewed

Forestry Commission, Ghana

The Wildlife Division of the Forestry Commission

Ministry of Food and Agriculture (MoFA)

Food and Drugs Authority (FDA)

Environmental Health Officers

Veterinary Services Directorate of the Ministry of Food and Agriculture

Representatives of various abattoirs

Representatives of various Animal Markets as well as 'Bush Canteens' (chop bars)

Animal Production Directorate of the Ministry of Food and Agriculture.

Municipal Veterinary Officers

Farmers (e.g., grasscutter farmers)

Regional Markets Observed/Interview Sites

The team visited the following live animal and animal products markets, conducted observations, and in some cases took photos:

Greater Accra:	Madina, Makola No. 2, Tulaku
Central Region:	KNM, Kotokoraba, MCM
Volta:	Dzodze, Ho, Waya
Upper East:	Bawku, Bolgatanga, Navrongo, Zebilla

Relevant Context

Ghana's Geographical Context

Ghana is a relatively small but heavily populated West African nation along the sub-Saharan southern coast, bordered on the west by Ivory Coast, on the east by Togo, and on the north by Burkina Faso. With over 30 million inhabitants, it is surpassed only by Nigeria for population among West African countries and is Africa's 14th most populated country overall. While its size (about 92,000 square miles) is relatively small compared to Nigeria, for example (which is about 357,000 square miles), it in fact traverses much the same latitudes and includes diverse habitat types.

In total, Ghana is divided into 16 regions.¹ Northern Ghana—the Savannah belt—comprises six regions that to some extent share a linguistic, cultural, and religious background. While Ghana has over 100 dialects, here there are significant similarities across the common dialects and similarities in cultural and other aspects of life. This region is closest to the Sahara Desert. There are also the Middle or Forest Belt and the Coast or Atlantic Ocean sectors.

The groups living in these areas also share many things in common. We selected one target study area from each of these three main sectors of Ghana. We also worked within a second site in the Atlantic, Greater Accra, which includes the nation's capital city, Accra, and is thus the policy-making and government agency center. The government actors we interviewed were located here. In addition, we address the significant market location, Kumasi (Kumase, in Twi) in this report. Kumasi is Ghana's second largest city, and, in fact, the highway connecting Accra and Kumasi is one of our primary study targets for information about the bushmeat trade in Ghana.

Economic and Cultural Context

Livestock (such as cattle, sheep, goats, pigs), birds (chickens, turkeys, guinea fowl) and wild animals (grasscutters/cane rats, deer, and bats) are meat sources for humans in Ghana. Dogs and cats are generally regarded as household pets, as are monkeys. Additional animals noted by interviewees include doves, wildlife such as antelopes, and animals such as lions and tigers that might also become zoo specimens. Parrots are frequently sold live at markets and taken home as pets. Pet species may be caught wild or domesticated for sale, and these practices are largely informal. Local dog breeds are generally not sold but traded for other commodities or given to friends and relatives. A noteworthy exception is the case of foreign dog breeds such as the Doberman or the Bull Mastiff, which are targeted to high-income clients, sometimes for security use.

Two particularly noteworthy farmed wildlife species in Ghana are the grasscutter (cane rat) and rabbit; the former is also a particularly emblematic bushmeat source in Ghana, as discussed further in the section on animal markets and supply chains. And the rabbit, a domestic pet in other international contexts but also a common food item, was the target of a substantial subsistence food production

1. There were formerly ten official administrative regions in Ghana, which were, as recently as May 2021, still used by agencies such as the Ministry of Food & Agriculture to organize regional and district directorates. See: Ministry of Food & Agriculture, Republic of Ghana, accessed October 2, 2023, <http://mofa.gov.gh/site/>.

project in Ghana in the late 1970s.² There is also a growing dog meat market in Ghana.³ As one Veterinary Office representative interviewed noted:

All domesticated animals can be segregated into pets and for consumption purposes. Sometimes some animals, such as ruminants and birds, become pets because of the relationship between the animal and its owner. But ... it will eventually end up in the market, although unconventional meat such as dog meat is being eaten these days as some people's delicacy.

The government of Ghana recently launched a rearing for food and jobs campaign, and this initiative is to break the glaring deficit in protein supply.⁴ This has resulted in increased livestock production nationwide in response to the increasing demand for animal protein. Increases in both human and livestock populations in the country have implications for the transmission of zoonotic diseases, as it allows more frequent interactions between humans and animals in a limited space. Multiple animals are kept in various homes at varying levels of confinement. Security concerns in urban areas have also resulted in an increased reliance on dogs for safety purposes, while financial considerations have mainly driven a rapid increase in livestock production at both the commercial and smallholder levels. A forestry officer we interviewed in the Upper East Region noted:

Animals like snakes, lion, elephant, antelope, deer, etc. are seen as wildlife, whereas cattle, sheep, goat, fowls, donkeys are considered as livestock, and cats and dogs are considered as pets. Pets are treated more special than the rest because they are most often considered as companion animals. Wildlife are seen as a threat to human life so most people do not like them but people keep livestock for both food and economic purposes.

Similar observations were made in the Volta Region, where animal markets and animal products inform how humans relate to animals and vice-versa. All respondents in our interviews there noted that the relationship between domestic animals and humans is a friendly one, though the same cannot be said of animals in the wild or of wildlife. Livestock have coexisted with humans for a very long time, with humans playing the ownership role of feeding and providing shelter as well as providing protection for animals. Because the rearing of animals is a commitment that needs total devotion for good yield, one must be dedicated to that work.

Respondents acknowledged that animal markets and animal products have both cultural and economic functions and agree that there is a cultural linkage between animal rearing and consumption in particular. Certain geographical areas are noted for some species of animals. In the Volta, there is no particular type of animal that can be connected to any community indigenously. Animals brought in

2. See: Jacob Owuso Sarfo, "Get the Rabbit Habit! National Rabbit Project, Mamattah and the Psychology of Rabbit Consumption in Ghana," *Africa: History and Culture* 2, no. 1 (2017): 4–9.

3. For further insight, see: S. Ohene-Adjei and Nikki Asuming Bediako, "What Is Meat in Ghana?" *Animal Frontiers* 7, no. 4 (2017): 60–2.

4. "Rearing for Food and Jobs (RFJ)," Ministry of Food & Agriculture, Republic of Ghana, accessed October 2, 2023, <http://mofa.gov.gh/site/programmes/pfj/70-pfj/pfj-modules/328-rearing-for-food-and-jobs-rfj>.

“commercial” quantities are gathered from different regions and countries to the various markets where the animals are sold. Despite the lack of animals linked to communities in the Volta Region, some areas have cattle markets, and goat, sheep, and other small animal markets; e.g., across the Volta Region, sites such as Waya, Dzodze, and Agbozome cattle markets, pockets of goat, sheep, and fowl markets, and roadside bushmeat animal markets spread along the major roads of the Volta Region. The financial benefits of these markets are distributed across all stakeholder groups. This is their primary source of income, and no alternatives exist for these markets and jobs. Culturally, live animal and animal product markets are part of a livelihood that is fundamental to the tradition and customs of the area. This is explored further below in the market overviews, for example, as pertains to Ghana’s open-air markets and roadside bushmeat markets.

Public Health Implications

Throughout our interviews, we encountered a general awareness of disease risks. In our conversations with regulatory personnel, it was clear that laws exist to govern a number of potential zoonotic risks. On the other hand, as photo evidence and interview responses demonstrate, there are general concerns about hygiene measures, enforcement, and compliance. In general, market stakeholders and supply chain players believe diseases originate at habitat sites, as opposed to processing and marketing sites. Since a major outbreak of Ebola in 2014, however, public education and awareness may be improving regarding zoonotic risks. Studies conducted in Ghana confirm these issues and have also tracked specific diseases to market spaces and practices. For example, a study conducted in the central region observed a significant difference between pet (dogs and cats) ownership and infection with *T. canis* in our study, similar to findings by others.^{5 6} In Nova Scotia, dog ownership was found to be a significant risk factor for infection in rural children, whereas a household dog appeared to present no risk to urban children.⁷ Children with pets in their homes may inadvertently acquire the infection through ingestion of eggs from their pets that contaminate the immediate environment.”⁸

Another study conducted in Ghana, including the central region, observed:

...the common bushmeat consumers patronized were grass cutter (73%), giant rat (17%) and monkey (8%). Fifty-four per cent (54%) were aware of possibility of transmitting zoonotic diseases through consumption of bushmeat, 33% were not aware; those who were aware gave Ebola (48%) and anthrax (16%) as examples of zoonotic diseases. Forty-four per cent (44%) of them had received information on transmission of zoonotic diseases from bushmeat to humans from radio and 33% had never heard it before from any source. A critical laboratory examination

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5. C. V. Holland et al., “Sero-epidemiology of Toxocariasis in School Children,” *Parasitology* 110, pt 5 (1995): 535–45.
 6. D. E. Thompson et al., “Epidemiological Characteristics of *Toxocara canis* Zoonotic Infection of Children in a Caribbean Community,” *Bulletin of the World Health Organization* 64, no. 2 (1986): 283–90. .
 7. Juan A. Embil et al., “Seroepidemiologic Survey of *Toxocara canis* Infection in Urban and Rural Children,” *Public Health* 102, no. 2 (1988): 129–33.
 8. G Kyei et al., “Sero-Epidemiology of *Toxocara canis* Infection in Children Attending Four Selected Health Facilities in the Central Region of Ghana,” *Ghana Medical Journal* 49, no. 2 (2015): 77–83.

of the part of bush meat that has the potential to transmit zoonotic disease is recommended for future studies.⁹

And a third study reported:

...the isolation of multiple antibiotic resistant Enterobacteriaceae phenotypes from raw meat sources and Ghanaian coin currencies in circulation at Cape Coast metropolis. The high levels of ESBL and MDR isolated from currencies from food vendors, transport operators, and students should be a public health concern since Enterobacteriaceae have the ability to transfer their resistant genes (mcr gene) among strains to confer resistance to colistin and tigecycline, the only effective therapeutic drugs against ESBL-E.¹⁰

To illustrate the complex nature of the Ghana case, consider the following. Our observations and interviews in multiple regions resulted in Veterinary Officer responses confirming a number of regulatory parameters and inspection practices, as, for example, the Upper East Region VO suggested. Our observation and interviews at other sites, such as the Dzodze Market and Ho (Volta Region) Abattoir spaces, veterinary monitoring sites, and nearby chop bars showed that proper inspection practices were in place at the time of our observations, or that, as at Dzodze, market leadership believed disease to originate before market arrival and that veterinary inspection sufficiently mitigated any potential risk at the market. But our observations also revealed that some food process-point stakeholders claimed “experience” as their method of determining whether or not an animal was diseased before they prepared food with it. The Ho Abattoir has been the subject of some controversy in the past and became a focal point of significant international investments in Ho Market redevelopment and modernization efforts. The new slaughterhouse opened but was abandoned for a time in 2019, for example, with residents returning to the older site and its known risks. In some cases, chop bar owners indicated that their parents’ experience and guidance permit a later generation to know if an animal is diseased, for example, and that the disease must have originated elsewhere if found on site. This particular site is an instructive Ghanaian example showing how stakeholders respond to economic demands through long experience, while also contending with the stigma of known zoonotic risks and an active development program. In general, respondents were aware of zoonotic risks and hygiene practices.

Animal Markets & Supply Chains

Livestock & General Overview

According to the 2016 FAO report on Ghana’s livestock, almost all cattle and smaller ruminants graze on natural pastures and rangeland. The average herd size is 10 for cattle, sheep, and goats, eight for pigs, and about 16 chickens. Poultry does at this time have a large-scale industry presence in Ghana;

9. F. Kuukyi, Richard Amfo-Otu, and E. Wiafe, “Consumer Views of Bushmeat Consumption in Two Ghanaian Markets,” *Applied Research Journal* 1, no. 1 (2014): 20–7. .

10. Alberta S. Anning et al., “Antibiotic Susceptibility Pattern of Enterobacteriaceae Isolated from Raw Meat and Ghanaian Coin Currencies at Cape Coast Metropolis, Ghana: The Public Health Implication,” *The Open Microbiology Journal* 13 (2019): 138–45. .

large-scale pig production is expanding in Western, Volta, and Central Regions, and there has been at least some transition to semi-intensive small ruminant farming as of 2016 as well.¹¹ Through the Ghana Commercial Agriculture Project (GCAP), the government is working on a variety of modernization and expansion programs including irrigation systems and rice production especially, though at the time of writing, the government is not yet expanding into livestock systems development. It should be noted that “commercialization” does not actually mean modernization, and the relatively high current rate of about 60% commercialization for pig farming, as opposed to only 3.1% for cattle, for example, belies the fact that it is perhaps the least modernized livestock system.¹²

Animal markets in Ghana exist in several forms. Some exist as specialized markets on their own (where live animals only are sold). Others have live animals, abattoirs, and animal products, whereas others are integrated within general goods markets. All are open markets. The types of goods sold are livestock (cattle, goats, and sheep), poultry, meat, and processed meat products (such as kebab). Animals bought from markets usually find their way either to other markets where they are sold or into homes, restaurants and chop bars, and hotels, where they are used for food. Some animals, such as doves, are kept as pets. Others are used for religious purposes. Those animals bought to be used for food usually leave the market already as meat because they are slaughtered at the abattoirs located inside the markets. In addition, skins are sold and used for wele (an animal hide snack) and as drum covers.

Unsanitary conditions at these markets, especially those with abattoirs, pose a great risk of disease transmission. Waste materials from the slaughtered animals are dumped right next to the abattoirs. No precautionary measures are taken to prevent disease transmission during slaughtering and handling of the animals. Animal parts are on the ground, on tables, and in immediate contact with those working at the market or shopping.

At all markets and in the traffic before and after market transactions, a number of stakeholders and middlemen take part in transport, handling, and processing. Interviewees often note that the imam performs slaughter, and indeed, Ghana adheres generally to halal slaughter parameters.¹³ This includes, for example, isolated animal slaughter and specific methods.

Ghana has a well-established open-air market tradition. One particularly well known such market, the Kumasi Central Market (also known as the Kejetia Market), demonstrates several persistent challenges to regulating a variety of risk factors at large city markets. One of these is fires that have been known to overtake these large market spaces, which are likewise well-known for being congested and difficult to navigate, let alone to patrol and regulate.¹⁴ Mask-wearing is compulsory in public spaces such as the large open-air markets, and the Kumasi slaughterhouse was shut down entirely in the wake of COVID-19.¹⁵ Of particular note, with regard to managing this massive, disparate, and informally

11. The full report is available at: <http://extwprlegs1.fao.org/docs/pdf/gha169291.pdf>

12. See again the 2016 FAO report on Ghana and, for further information about GCAP, see: <https://gcap.org.gh/what-we-do/>

13. The 2016 FAO report notes that one of the few cases of intensive system rearing was for “rams and bucks” to be used for religious festivities, which primarily means that they are kept pen-bound for feeding (as opposed to ubiquitous grazing/rangeland approach) and “fattened” for sacrificial use. Halal slaughter is required for Muslim meat consumption, and 18% of Ghana is Muslim. Some regions have higher percentages (i.e., 60%+ in the Northern region). So this would relate to demographic and regional demand as well as slaughter requirements. References made to “Northern Region” in these cases includes Northern region, Upper East region, and Upper West region.

14. For a review of the series of fires at Kumasi Central Market that motivated recent efforts to redesign that vital civic center, see Emmanuel K. Addai et al., “Trend of Fire Outbreaks in Ghana and Ways to Prevent These Incidents,” *Safety and Health at Work* 7, no. 4 (2016): 284–92.

15. See: Frederick Y. Obese et al., “Impact of COVID-19 on Animal Production in Ghana,” *Animal Frontiers* 11, no. 1 (2021): 43–6. Kumasi is known as the primary cattle city of Ghana. It has been a major focus for zoonotic disease research for some time. See also: E. Otupiri et al., “Detection and Management of Zoonotic Diseases at the Kumasi Slaughterhouse in Ghana,” *Acta Tropica* 76, no. 1 (2000): 15–9.

organized space, is the recent renovation of the market structure to mitigate fire and criminal activity. Part of that market renovation includes dedicated butchery and fishmonger stalls and a more efficient, organized space in general that can thus be more effectively monitored and managed.¹⁶ However, this reorganization perhaps most noticeably restricts the famous street vendor economy of the market space.¹⁷ This marginalization of what is a primary subsistence livelihood for many in Ghana relates to one main mode of bushmeat vending, the informal roadside sales noted in this report. On the other hand, the emergence of online market spaces, including, for example, the Facebook Ghana Grasscutter Farmers Association, discussed at greater length in the micro-livestock discussion later in this section, suggests that individual vendors of meat or other items still subsist even in more managed market city regions such as Kumasi.

Interviewees often noted that markets are set up for specific types of animal sale, but this may also mean that many different kinds of animals are routinely sold together in the same market. For example, as a Greater Accra Veterinary Service Department representative noted, “the Tulaku market in Ashaiman is mainly for cattle, goats, guinea fowls and others for small ruminants.” A CCKM seller noted, on the other hand:

We see to the transportation, that they are well transported in a manner that will not [produce] any contamination, as in dust, flies, and all sorts of those stuff. In this country, most of our markets are open markets, goods are sold in the open. Here the animal market is an open one, the slaughterhouse is just by the sea and the veterinary office; we don't have structured markets for animals. We sell goats, cattle, sheep; some deal in pigs and domestic fowls.

Additional responses from multiple stakeholders in different regions confirmed a variety of potential concerns in the market space, such as unsanitary conditions, informal organization that could introduce public health risks, etc.:

MCM Buyer: Unregulated and unhygienic markets. The unhygienic nature exposes them to diseases of all kinds. Poor sanitary conditions, lack of gloves, poor storing of food due to lack of refrigerators and so forth. So many types of goods, including cattle, goats, etc.

KNM Buyer: Animal markets operate on the informal front in my community. Handling is done by the producers, who process them and display them in the market for sale. Other products derived from using animal parts are also sold on the market in general.

At Navrongo animal market, we observed that goats, sheep, dogs, and fowl are sold at the same market. The form of the market here is an open market. Apart from the animals, there are no goods that

16. The remodel was a major international investment and architectural task, with stakeholders in Brazil and lending structured by Deutsche Bank. Specific motivations included food hygiene. Not only was the surrounding civic infrastructure updated, but the specific meat market additions included significant attention to cold storage infrastructure. It was unveiled as a major planning and financing accomplishment. See for example the Deutsche Bank publicity website detailing the project: “Market Makeover,” flow, September 2019, accessed October 2, 2019, <https://flow.db.com/trade-finance/market-makeover>.

17. Victoria Okoye, Street Vendor Exclusion in “Modern” Market Planning: A Case Study from Kumasi, Ghana (Manchester: WIEGO, 2020), <https://www.wiego.org/sites/default/files/publications/file/Okoye-Street-Vendor-Exclusion-Kumasi-Ghana-WIEGO-Resource%20Document-15.pdf>.

are exchanged here at this market. A sheep and goat dealer said, “there are two markets: the small ruminant market and the cattle market.” The interaction of animals and humans at the market is often so close that it can pose a high risk of the spread of zoonotic diseases.

There are several animal markets located within the general open markets in the region. However, the major animal markets recommended by the veterinary officers at the Veterinary Services Directorate (VSD) in the Greater Accra Region were the Tulaku Livestock Market at Ashaiman, the Madina market, and the Makola number 2 market located in the central business district of Accra. These markets were selected because they exhibit the characteristics of a typical animal market in the region. There are similar other open markets across the 16 regions of Ghana. An MCM Buyer noted that “there are over 100 markets in Ghana, e.g., Kumasi meat market, Accra, Tamale, and so forth.” A KNM buyer said that there were an “uncountable number of markets (small and big scale) and spread across the Region.” This relates to the informal status of, in particular, bushmeat animal market sites throughout Ghana. Bushmeat sales often take place along roadsides, without consistent locations and with dynamic, itinerant, and opportunistic vendor presence. Furthermore, supply chains are not always formalized, and individual actors may bring their animals to the designated slaughterhouses to be processed. For example:

AO: Normally, animal markets are available during occasions such as Christmas at the Kotokuraba and Abura markets. Animal markets can also be found along the roads. The animals are transported by vehicles to the slaughterhouses.

VO: We have recognized butcher shops in the main market, smaller shops who sell live animals as we don't have a designated market for selling of live animals. Some animal owners bring them directly to the slaughterhouse to sell it.

Livestock market spaces are more formally designated:

Senior Regulatory Officer FDA: Per my knowledge, there are five types of animal markets located variously in the Navrongo, Bolgatanga, Zebilla, and Bawku markets. These include: goats and sheep, cattle, dogs, donkey, and fowl markets.

Senior Environmental Officer: There are five animal markets that exist in the municipality. These include the cattle market, donkey market, sheep and goat market, and fowls market, and they all are located in the municipality.

These animal markets fall under the informal business sector of the country's economy, which employs about 80% of the Ghanaian population. One potential benefit is to provide occupation for the country's youth. Some of the animal markets in Accra are controlled by imams. Alternatives to these markets are the cold stores, where frozen meat and meat products are sold. Demand for these frozen alternatives has generally increased over the years. More people opt for the gizzards, sausages, ham,

and other processed meat, due to convenience. Aside from serving as a venue for employment and jobs, they also serve as raw materials for industries such as meat processing, traditional purposes such as marriage rites, funerals, and naming ceremonies, and other festivities such as Ramadan and Christmas, etc. Interview responses suggested a variety of positive social functions for the markets, including the following:

Municipal Environmental Health Officer, ASHMA: These markets serve as a place for buying and selling, a reliable source of employment for all.

Veterinary Service Department: These animal markets fall under the informal business sector of the economy of the country which employs about 80% of the Ghanaian population, thereby helping to curb unemployment of the youth. Some of the animal markets in Accra are controlled by imams.

But other interviewees noted the shifting role of these markets in Ghanaian meat consumption:

Seller, Madina Market: The cold stores are really competing with us. People go there to buy their meat, instead of coming to buy the fresh animals for us to slaughter for them, or even the fresh meat.¹⁸

Consumer, Madina market: Meat from the cold store is so convenient. They've already done everything. All I have to do is buy it and go and make my food. It is also very economical. Personally, I only buy live animals or fresh meat occasionally. I can get a cold store anywhere. Live animal markets are not available everywhere.

Still other respondents noted the fundamental cultural value of market participation:

KNM Buyer: The markets exist to satisfy the demand and supply of animal products. While the vendors make their living from the sale of animals and animal products, the consumers also derive their satisfaction from its purchase for the final intended purpose. Culturally, some of these animals even serve as emblems for such groups of people.

AO: Animal markets provide a source of income for farmers, drivers, butchers at the slaughterhouses, and other people in the chain.

VO: Culturally, for festivities, especially for Ramadan, afahyes, and outdoorings.¹⁹ Also plays a huge role in economics as it is a major source of income for stakeholders, among others, who use it for marriage purposes. It has so many economic benefits that animal thieves invest a lot to steal and sell animals, as it is a booming business.

18. Ghana's frozen food demand trend aligns with other developing civic infrastructures. Among current studies on frozen food demand in Africa, this Thünen Institute (Germany) market analysis for Ghana tracks the shifting foodways underlying the change, including food safety concerns and economic needs: "Consumers' Preferences and Demand for Poultry Meat in Ghana," Thünen, accessed October 2, 2023, <https://www.thuenen.de/en/institutes/market-analysis/projects/consumers-preferences-and-demand-for-imported-poultry-meat-in-ghana>.

19. The Fetu Afahye, for example, is a seasonal festival commemorating times disease outbreaks befell the community and celebrating recovery, hygiene, and prevention of future epidemics.

Market Chief (Upper East Region): These animal markets serve several socioeconomic purposes. They provide the main source of income for animal producers. Some people augment their income from other sources from the activities that they engage in at the animal markets. It serves also as a ground for social interaction where traders and other actors build strong social bonds and community linkages for mutual benefit. Some actors feel that the animal markets provide them a proper ground to discuss other clan and family issues.

The Municipal Revenue Accountant (Bolgatanga, Upper East Region): We normally go to the markets to supervise our revenues fees, compliance, and exit receipts because these markets serve as one of the major sources of revenue for the municipality.

A trader from Bolgatanga Market opined that people come to buy animals to pay the bride price of their wives: “Market chiefs and other opinion leaders get to advise on the size of animals to buy as well as negotiate with in-laws to accept their offers.”

Animal markets in the regions visited and throughout Ghana exist mainly for the sale of animals and animal products for food. Some buyers purchase these animals to be sold onto smaller markets, while others buy them as meat to serve their homes, hotels, or restaurants. Such markets also may serve recreational purposes. Interviewees generally agreed that these markets not only supported individual livelihoods but also responded to consumer demands. The role of animal protein in Ghanaian diets was one demand noted by multiple stakeholders, as was pet procurement. Some also noted that the physical animal market space played an important role in Ghana, where one farmer noted that it would otherwise “have been hard for us to do marketing.”

Veterinary Service Department: Livestock animal markets in the Greater Accra region are normally affiliated with some specific ethnic and religious group, mostly from the northern part of Ghana, and are Islamic.

Ghana’s grasscutter (cane rat) production and consumption chains demonstrate the country’s developing and traditional meat economies, crossing into both wildlife bushmeat and emerging micro-livestock modes. Micro-livestock farming consists of domesticating animals found in the wild like snails, snakes, and palm weevil larva.²⁰ Other species include guinea fowl and rabbits. Wild animals like grasscutters are usually transported after they are killed, so most come to the market dead. In contrast, animals such as snails and grasshoppers may be transported and sold live. Grasscutters, like the rabbit in the 1970s home food production movement in Ghana, have become a significant micro-livestock object. The grasscutter is a very common wildlife bushmeat purchase along roadsides and, in the Ghanaian context, may also be common restaurant fare in the chop bars typical of southern Ghana, particularly in major city centers such as Kumasi and Accra. Chop is etymologically related

20. As Kathleen Kinsella writes in a study of the Agroforestry Practices to Enhance Resource-Poor Livelihoods (APERL) Project in Ghana, “‘Micro-livestock’ is defined as micro-breeds (less than half the size of most common breeds) of conventional livestock (i.e. sheep, goats, pigs) and native, domesticated or semi-domesticated rodents (i.e., grasscutters).” Kinsella also notes, citing BOSTID, 1991 and others, that micro-livestock is cheaper to buy than conventional livestock and requires far less arable land, all of which make micro-livestock a potential boon for subsistence farmers. Micro-livestock in Ghana includes “guinea fowl and chickens (poultry), domesticated rabbits, beekeeping, and snails.” See: Kathleen Kinsella, “Micro-livestock for Livelihoods: Meeting Practical and Strategic Needs of Women in Sunyani District, Ghana,” Master’s Thesis (Guelph: University of Guelph, 2012), 20–1.

to both “to eat” and “to cut up,” and chop bars and the bushmeat trade in cities that serves them are typically overseen by women, in contradistinction to the typically male-dominated livestock market and slaughter roles.²¹ The grasscutter has received some international attention in recent years as an emergent livestock market.²²

Ghana’s Wildlife Markets

Alongside grasscutters and rabbits among wildlife-farmed species, there is an active consumer market for smaller insect species as well. Some of these farming practices of smaller species are promoted for their perceived ecological and nutritional benefits—smaller scale, less impact. This includes the snail and palm weevil. Others, such as the crickets and caterpillars currently sold as wildlife, have not yet become common micro-livestock targets. However, they are considered delicacies. In part, farming such species can mitigate known restrictions on the wild hunting of snails, for example, ostensibly promoting a more controlled food production and mitigating known seasonal hunting restrictions or more pronounced availability challenges. It should also be noted that this is an important intersection of cultural attitudes and formal livestock regulatory frameworks that articulates the Ghanaian context.

Governmental controls do not normally apply to the collection of invertebrates such as insects and snails, but in many African communities the collection of these groups of wild animals is governed by traditional rules and regulations. For example, in the southern forest areas of Ghana, particularly in Ashanti, an unwritten traditional law involving closed seasons exist that was highly respected in the past and effectively regulated the exploitation of the giant African snail, *Achatina achatina*. The closed season for forest snails was strictly enforced in most Ashanti villages; at the beginning of the snail season when the snails were laying their eggs the town crier would inform the community of the ban on snail collection. This was aimed to allow hatching and growth of young snails. This was strictly adhered to until the season was opened by another announcement from the town crier.²³

Guinea fowl are a relatively common household animal. They are essentially considered a domesticated animal and individuals have them as part of their home farms, mingling with chickens and other fowls in many cases. There are a number of regulations for domestic farm animal enclosures, as well as for dog vaccination, for example, but there is not an active regulatory enforcement practice.

Irrespective of the region, wildlife trade is similar: As a means to survive and to make an economic profit, individuals sell bushmeat along the roadside. The bushmeat trade is very informal, and there is no specific marketplace in Ghana where you can buy bushmeat other than the sides of roads.

21. Yepoka Yeebo’s 2016 investigative journalism piece on the Kumasi bushmeat abattoir and chop bar culture addresses this etymology and the common practices surrounding “Ghana’s biggest bushmeat market.” See: Yepoka Yeebo, “Inside Ghana’s Biggest Bushmeat Market,” *Science: The Wire*, October 2, 2016, <https://science.thewire.in/health/inside-ghanas-biggest-bushmeat-market/>.

22. A Sept. 2, 2017 piece in *The Economist* on raising grasscutters in Kumasi covers some general Ghana numbers on farming efforts as well. It mentions a 2007 German study finding 1400 grasscutter farmers in Ghana. However, a fairly active Facebook group for a Ghana Grasscutter Farmers Association currently has 2,300 members posting multiple ads per day selling grasscutters, seeking farm labor, and more (“Ghana Grasscutters Farmers Association (CGFA),” Facebook, accessed October 3, 2023, <https://www.facebook.com/groups/1576887639240168/>). Among the drivers of this emergent livestock market, as noted in *The Economist*, is the threat to forests from hunting. However, despite these efforts to domesticate species like the grasscutter, there is a persistent preference for wild caught bushmeat. Of special note: the price was once substantially higher for domestic grasscutter due to the input requirements (\$80.00 in 2007) but the Facebook page now has sales of mature domesticated grasscutter at 200 cedi (\$35), which is the rate wild caught were going for in 2007. The market shift may be well on its way now. “The Grasscutter Shows Why It is Hard to Stop Bushmeat Hunting,” *The Economist*, August 31, 2017, <https://www.economist.com/middle-east-and-africa/2017/08/31/the-grasscutter-shows-why-it-is-hard-to-stop-bushmeat-hunting>.

23. Yaa Ntiamao-Baidu, “Substance Hunting and Gathering,” in Chapter 4, “Wildlife Production Systems: Potentials for Food Security,” in *Wildlife and Food Security in Africa* (Rome: FAO, 1997), <http://www.fao.org/3/w7540e/w7540e0i.htm>.

These locations are not consistent, but there are known roadside spots where you can expect to find bushmeat vendors in all of the three sectors. You may find on your next trip that they are not there or have moved to another spot along that roadway. The majority of these vendors are actually farmers, and they may be doing their farming work or on their way between work sites with their guns, and may simply see and shoot animals when possible. In an event known locally as “Market Day,” populations from surrounding villages in a given region congregate and bring their products to sell.

The bushmeat trade industry is not heavily regulated, although there are regulations in existence. As will be addressed further in the sections on regulatory practices and challenges, the bushmeat trade is noteworthy for its itinerant and informal nature, making it challenging to enforce the regulations that do exist or they are not a priority. Vendors are usually operating on their own, selling animals that they themselves have captured. Most of the time they are only selling a single species. Sometimes they sell more than one species at once, and sometimes there are no animals available for sale at all. An individual vendor may specialize in selling specific species; however, generally these sales are driven by chance, opportunity, and access. For example, if an individual happens to find and catch a grasscutter that morning, that person may decide to sell this animal along the roadside in hopes of earning additional income. Similar to the chance that a roadside vending location has moved since past visits, likewise the available species can change. A grasscutter vendor one day may be a rabbit or snail vendor upon one’s next visit.

Species commonly sold in the roadside markets include: grasscutters, rabbits, and sometimes insects or terrestrial mollusks such as, once again, snails. However, rarer species can sometimes be found as well, including meat from crocodiles, bats, gorillas, and monkeys. Some of these species are endangered and considered very valuable. Monkey and baboon are near-extinct but are also considered delicacies. What types of animals are available at bushmeat markets is not only a product of opportunity, as noted, but also may vary during different times of year, especially with respect to migratory species such as bats, which can be found in great numbers in Ghana during certain seasons.

Bushmeat customers are generally not close to a vendor’s economic circle. Some animals, such as grasscutters, can be very expensive. Roadside markets are generally not catering to the vendor’s peers, but are instead marketed toward wealthier urbanites that drive by while commuting between cities. Intercity commercial buses are sometimes targeted by vendors who may spot one and ask the driver to stop for tourists who want to buy bushmeat. For example, there are buses traveling between the capital city of Accra and the “Second City,” Kumasi.²⁴

Bats are considered a delicacy, especially in the Northern sector. Fruit bats are sold dead, and often smoked. *E. helvum* is the species that “seems to form the vast majority of all bats hunted and sold in southern Ghana” because hunters and vendors believe that “insectivorous bats smelled and tasted unappetizing, and are thus never eaten.”²⁵ Generally, their skin is removed, and their meat roasted and

24. To give a sense of this geography: Accra is a coastal belt city in the Greater Accra Region. Kumasi, home to the largest market in Ghana, is in the Ashanti Region of the forest belt. A third region, the Eastern, is between Greater Accra and Ashanti. Under the 2018 revised regional division of Ghana, this is all unchanged. However, other intercity routes could now include more discrete regions and potential border governances than before and, as a result, further complexities of regulation and cost incurrence.

25. A.O. Kamins et al., “Uncovering the Fruit Bat Bushmeat Commodity Chain and the True Extent of Fruit Bat Hunting in Ghana, West Africa,” *Biological Conservation* 144, no. 12 (2011): 3002–3.

consumed instantly in dishes like kebab. Bat meat can also be dried and sold as an ingredient for soups. Individual customers usually buy small amounts.²⁶

In the wake of the 2014 Ebola outbreak, restrictions were placed on hunting bats and, despite some reports of shifting perceptions about bat meat, there has remained a desire to continue consuming it. The 2014 Ebola outbreak led to further prohibitions on bat hunting in cities where bats roost, for example. Restrictions on vending and consumption were not enforced prior to 2014. However, roasting bats has long been the method of selling bats for consumption in Ghana, so even with restrictions on hunting, the vending and purchase at roadside sites is not regulated. Likewise, if bat is already in soup in a restaurant, regulations will not be enforced. On the other hand, the fruit bat is known to be sold whole as undressed carcasses in other locations.²⁷

Those who capture and kill bats face a higher risk of zoonotic disease transmission than those who consume it cooked. Among the known zoonotic transfer points, one method of dispatching bats when caught in nets, for example, is to take the bat's neck between the teeth and crush the skull.²⁸ Additionally, "the use of bats in traditional medicine adds to the potential sources of human–bat interactions that can result in the transmission of zoonotic diseases."²⁹ Once Ebola was linked to bats, a regulation was imposed holding that whoever hunts bats is subject to arrest. However, studies found that knowledge of zoonotic risks did not influence behavior towards bats. After the Ebola outbreak, 46% of respondents of a survey said that they had not changed the way they interacted with bats. In addition, respondents who believed that "bats could carry disease pathogens"³⁰ were 2.1 times more likely to come into direct contact with bats through hunting or bat meat consumption," and those with prior knowledge of bats as possible carriers of disease were 3.2 times more likely to eat bat meat.³¹ In Ghana, specifically in the Volta Region, there is, in fact, a suspicion of Western influence fabricating Ebola altogether and, among those who hold such views, that "the aim is to discourage them from killing animals. This has resonated with the belief in the Ve Golokuati Township [...] that bats do not harbour disease. Their view is informed by the non-occurrence of any strange disease outbreaks in the town..."³²

Although many Ghanaians avoid bats either for fear of stigma or punishment, or simply because they do not have opportunity to eat bats in the cities, some still have an appetite for it and will buy it on the illegal market, for example, when they travel outside of the city and its more forceful regulations and social customs. Vendors' relation to bat meat is, however, two-sided: they both promote bat meat to their customers that have a preference for it and hide the fact that it is bat meat for customers who are looking for something else. Vendors have reported buying "as many bats as their available cash flow would allow

26 A.O. Kamins et al., "Uncovering the Fruit Bat Bushmeat Commodity Chain and the True Extent of Fruit Bat Hunting in Ghana, West Africa," *Biological Conservation* 144, no. 12 (2011): 3006.

27. See also Tammy Mildenstein, Iroko Tanshi, and Paul A. Racey, "Exploitation of Bats for Bushmeat and Medicine," in *Bats in the Anthropocene: Conservation of Bats in a Changing World*, ed. Christian C. Voigt and Tigga Kingston (New York: Springer, 2015), 325–75, https://link.springer.com/chapter/10.1007/978-3-319-25220-9_12.

28. Efuet Simon Akem and Ngambouk Vitalis Pemunta, "The Bat Meat Chain and Perceptions of the Risk of Contracting Ebola in the Mount Cameroon Region," *BMC Public Health* 20 (2020): 593, <https://bmcpublihealth.biomedcentral.com/articles/10.1186/s12889-020-08460-8>.

29. Francis Gbogbo and Joseph Kobina Daniels, "Trade in Wildlife for Traditional Medicine in Ghana: Therapeutic Values, Zoonoses Considerations, and Implications for Biodiversity Conservation," *Human Dimensions of Wildlife* 24, no. 3 (2019): 299, DOI: 10.1080/10871209.2019.1605637.

30. Elaine T. Lawson et al., "Avoiding Bites and Scratches? Understanding the Public Health Implication of Human–Bat Interactions in Ghana," *Zoonoses and Public Health* 66, no. 1 (2019): 112.

31. Elaine T. Lawson et al., "Avoiding Bites and Scratches? Understanding the Public Health Implication of Human–Bbat Interactions in Ghana," *Zoonoses and Public Health* 66, no. 1 (2019): 112.

32. Efuet Simon Akem and Ngambouk Vitalis Pemunta, "The Bat Meat Chain and Perceptions of the Risk of Contracting Ebola in the Mount Cameroon Region," *BMC Public Health* 20 (2020): 593, <https://bmcpublihealth.biomedcentral.com/articles/10.1186/s12889-020-08460-8>.

at any given time” and that they have “a greater customer demand than they could supply.”³³ There are some ethnic groups in Ghana, especially those from the Northern parts, who do not see anything wrong with consuming bat meat. Vendors would disclose the availability of bat meat as such to those clients. However, if a seller suspects that a potential buyer will prefer, for example, bird meat, the bat meat would be presented as bird kebab instead of bat kebab. One particularly unethical practice related to such marketing approaches is that pork is sometimes presented to Muslims as another kind of meat. Prior to the 2014 Ebola outbreak, a study conducted in 2011 found that none of the 39 interviewed vendors sold only bats, and that no bat hunter was a full-time bat hunter, or even a commercial bushmeat hunter.³⁴ The vast majority of commercial hunters kept some of their catch for personal consumption.³⁵ Another study observed 55 bodies of straw-colored fruit bats on sale in the major markets within the Accra Metropolitan Area (Timber, Kaneshie, Nima, Adabraka, Awoshie market, Agbogbloshie, Tesano). Other species sold for their traditional medicine benefits include rats and mice.³⁶

To reiterate one potential challenge: buyers do not always know for sure what they are consuming. There is a complex relationship between an individual consumer’s desired meat and the vendor’s disclosure or, at times, a misrepresentation of one kind of meat for another. And in some restaurant settings, one may not explicitly request bat meat, the restaurant may not explicitly advertise bat meat, and yet bat meat will be sold and consumed with a general understanding between the parties. Likewise, roadside vendors will have specific meats and a consumer may be seeking a specific type of meat. In these cases, it is unlikely that the meat would be unprepared—it will most likely already be cooked in fact, perhaps in a soup or as a kebab. Otherwise, it would likely be much more difficult to pass off one kind of meat for another to a reasonably experienced consumer.

Dogs are very common, and almost every household has a dog. These dogs are thus pets but also are economic partners in hunting practices. Dogs are used in the hunt because of their speed and heightened senses of smell. They are useful for locating and tracking grasscutters, especially. Communal hunting consists of around 15 adult males with guns, sticks, and dogs. In an economic pursuit, farmers use dogs to kill other animals, like rabbits, which are hard to chase and catch. Sticks are used to hit against the grass and force animals, such as grasscutters, to retreat and thereby indicate their location to the hunting party.

Like bats, monkeys, which are almost extinct in the region, are considered a delicacy. Chimps, monkeys and baboons are consumed in every region of Ghana. Most megafauna in Ghana have been hunted to the point where these animals are nearly extinct in the wild and are only found in zoos or private ranches and conservation areas, where no one is allowed to hunt. Some do so illegally, but if these animals were still present outside those areas, they would have been—and have been—hunted using dogs as hunting partners. Ghana does not have “canned hunt” game ranches for hunting tourism.

33. A.O. Kamins et al., “Uncovering the Fruit Bat Bushmeat Commodity Chain and the True Extent of Fruit Bat Hunting in Ghana, West Africa,” *Biological Conservation* 144, no. 12 (2011): 3004.

34. A.O. Kamins et al., “Uncovering the Fruit Bat Bushmeat Commodity Chain and the True Extent of Fruit Bat Hunting in Ghana, West Africa,” *Biological Conservation* 144, no. 12 (2011): 3005.

35. A.O. Kamins et al., “Uncovering the Fruit Bat Bushmeat Commodity Chain and the True Extent of Fruit Bat Hunting in Ghana, West Africa,” *Biological Conservation* 144, no. 12 (2011): 3007.

36. Francis Gbogbo and Joseph Kobina Daniels, “Trade in Wildlife for Traditional Medicine in Ghana: Therapeutic Values, Zoonoses Considerations, and Implications for Biodiversity Conservation,” *Human Dimensions of Wildlife* 24, no. 3 (2019): 299, DOI: 10.1080/10871209.2019.1605637.

Transport

There is active animal traffic throughout Ghana. At Ghana's livestock markets, animals are transported from other regional districts, i.e., from the Northern Region to the Greater Accra Region, and also from other countries, such as Burkina Faso. Some products may become regionally associated with specific origin points. For example, eggs are mostly brought from the Bono and Ashanti Regions of Ghana. Guinea fowls are usually brought from Northern Ghana. Meat from wild animals, such as grasscutters, deer, and bats, are also imported from Peki, Ho, and Juapong in the Volta Region, from Kwahu, and from the Akuapim area in the Eastern Region. The interviews demonstrated a widely known, dynamic animal trade with multiple transport methods and stakeholders involved. Particular transport methods, such as the trotro, privately owned minibuses, and shared taxis that travel fixed routes that usually leave when the taxi is filled to capacity, indicate significant animal–human interaction in confined spaces, for prolonged periods of time, and also additional people not connected to the animal trade potentially being in contact as well. Most of the livestock markets have abattoirs attached to them, where these animals are slaughtered for buyers who prefer it that way. The means of transporting these animals is based on the quantity, so either by long vehicles (e.g., articulated trucks) or public transports such as taxis.

One animal transport issue of note with regard to zoonotic risks is the case of small ruminants, including goats and sheep. A 2016 USAID report on Ghana notes the country's seasonal reliance on small ruminant imports (estimates vary from 100,000 to 200,000 animals), and that both import and export consist of only live animals.³⁷ Individual stakeholders, such as butchers and itinerant vendors, are the primary players. These sales can be of live animals to households for breeding or food, and they can also be butchers selling to final consumers.³⁸ This trade includes neighboring countries, such as Burkina Faso.³⁹ This trade is characterized by fairly dispersed, informal, and underregulated practices among multiple players and intermediaries, all brought together at different markets in Ghana.⁴⁰ These animals travel in tightly packed conditions, often on the roofs of public buses or on motorized three-wheelers and motorcycles. Slaughter is generally unregulated. Middle income and higher-end consumer preference in Ghana is for Burkinabé small ruminants (the Sahelian breeds) because of their bigger body sizes, further driving these transport practices, given the economic incentives.⁴¹ The Upper West region is noted as a site of many tanneries that purchase small ruminant skins from Burkina Faso and also from domestic Ghanaian producers.⁴² Ghana also serves as a transfer point for animals coming from or going

37. USAID From the American People. "Resilience and Economic Growth in the Sahel – Accelerated Growth (REGIS-AG) Project. Value Chain and End Market Assessment: Small Ruminants." August 31, 2016. Available at: https://www.usaid.gov/sites/default/files/documents/1867/USAID_REGIS-AG_Small_Ruminant_Value_Chain_and_End_Market_Assessment.pdf. p. 56

38. V. A. Clotey et al., "The Small Ruminant Production System in Northern Ghana: A Value Network Analysis," *Livestock Research for Rural Development* 19, no. 11 (2007): 167, www.lrrd.org/lrrd19/11/clot19167.htm.

39. USAID From the American People. "Resilience and Economic Growth in the Sahel – Accelerated Growth (REGIS-AG) Project. Value Chain and End Market Assessment: Small Ruminants." August 31, 2016. Available at: https://www.usaid.gov/sites/default/files/documents/1867/USAID_REGIS-AG_Small_Ruminant_Value_Chain_and_End_Market_Assessment.pdf. p. 56

40. USAID From the American People. "Resilience and Economic Growth in the Sahel – Accelerated Growth (REGIS-AG) Project. Value Chain and End Market Assessment: Small Ruminants." August 31, 2016. Available at: https://www.usaid.gov/sites/default/files/documents/1867/USAID_REGIS-AG_Small_Ruminant_Value_Chain_and_End_Market_Assessment.pdf. p. 56

41. USAID From the American People. "Resilience and Economic Growth in the Sahel – Accelerated Growth (REGIS-AG) Project. Value Chain and End Market Assessment: Small Ruminants." August 31, 2016. Available at: https://www.usaid.gov/sites/default/files/documents/1867/USAID_REGIS-AG_Small_Ruminant_Value_Chain_and_End_Market_Assessment.pdf. p. 10

42. USAID From the American People. "Resilience and Economic Growth in the Sahel – Accelerated Growth (REGIS-AG) Project. Value Chain and End Market Assessment: Small Ruminants." August 31, 2016. Available at: https://www.usaid.gov/sites/default/files/documents/1867/USAID_REGIS-AG_Small_Ruminant_Value_Chain_and_End_Market_Assessment.pdf. p. 11

to other countries, including Senegal, Togo, and Côte d'Ivoire.⁴³ Human–animal contact throughout these transport flows is constant.

More recently, market spaces are showing signs of regulating against itinerant individual vendors, for example, like at the largest market in Kumasi, which is also widely known to the international community as a major tourist site and a recognized market locale for Ghana's kente fabric. What this means for the bushmeat trade especially, which is composed almost entirely of such individual, itinerant, and opportunistic actors, is unclear, given that the market space for that trade is not in fact localized at these major market sites besides the meat stalls therein. Instead, the chop bars in large cities are the most common consumption site. But as an emergent regulatory and market-organization logic, this approach to managing the vendor–consumer contact nexus, in conjunction with the known controls on meat slaughter sites due to zoonotic outbreaks, suggests a potential shift for both the bushmeat and domestic livestock trades.⁴⁴

Market interviews revealed further aspects from stakeholder perspectives and showed the general knowledge of Ghana's active animal traffic.

Animal Production Department: [There are] strategic livestock game funds scattered around the country, so we have two of these in Accra; these are what we call livestock breeding stations. Their mandate is to produce and multiply some local species of animal for supply to farmers and prospective farmers nationwide; if you go [to] Nungua, for instance, the Nungua livestock breeding station, we breed pigs (mostly exotic breeds), rabbits, grasscutter (to a lesser extent). Basically, they do breed and try to multiply the species and distribute to those who need them.

Wildlife: It is hard to find hunters of wild animals in this region, as sellers usually purchase already-slaughtered and processed meat from their sources. Sellers in these markets generally do not handle the animals themselves. Livestock are, however, transported from these long distances to the markets by trucks, where they are housed and displayed in open cages until they are sold. Once in a while, individuals bring in the animals they rear in their homes to be sold at the markets on their behalf.

Tulaku Market: Livestock such as goats, sheep, and cattle are brought in from Tamale and Bawku in the Northern parts of the country, and even from Burkina Faso, where they are reared. Chickens are produced within the Greater Accra Region. Eggs are brought from the Ashanti Region and Dormaa in the Bono Region. Guinea fowls are usually brought in from Northern Ghana. Doves are also imported from the Volta and Northern regions. The market has an abattoir close to the live animals for slaughtering and commercialization of animal products.

Madina Market: The sheep and goats mostly come from Burkina Faso, Bawku, and Tamale. Guinea fowls also come from the Northern regions. There are doves which are brought in from the Northern

43. USAID From the American People. "Resilience and Economic Growth in the Sahel – Accelerated Growth (REGIS-AG) Project. Value Chain and End Market Assessment: Small Ruminants." August 31, 2016. Available at: https://www.usaid.gov/sites/default/files/documents/1867/USAID_REGIS-AG_Small_Ruminant_Value_Chain_and_End_Market_Assessment.pdf. p. 45

44. For example, the Kumasi slaughter sites have been major foci for outbreak containment efforts in prior contexts and now in direct response to COVID-19. See again Frederick Y. Obese et al., "Impact of COVID-19 on Animal Production in Ghana," *Animal Frontiers* 11, no. 1 (2021): 43–6; and E. Otipiri et al., "Detection and Management of Zoonotic Diseases at the Kumasi Slaughterhouse in Ghana," *Acta Tropica* 76, no. 1 (2000): 15–9.

Region and parts of the Volta Region. Chicken are mainly obtained from within the Greater Accra Region. The animals are generally brought in trucks or cages (in the case of the birds). There is an abattoir close to the market where the animals are slaughtered for people who would want them slaughtered.

Makola Market No. 2: Raw or smoked meat from wild animals such as grasscutters, deer, and bats are imported from Peki, Ho and Juapong in the Volta Region, and Kwahu and the Akuapim areas in the Eastern Region.

CCKM Seller: Some go to Yeji to buy cattle, some also go to Kumasi, some go as far as Bawku those areas, Burkina Faso. When they bring these animals, I learnt they keep them in their various homes for safety reasons. As for the goats and sheep, they buy them from the surrounding villages here. Animals are captured with the help of those we deal with for animal supply. Transporting them is quite expensive, especially if you are bringing them from the north. Normally, our means of transport is tro-tro and taxi, but if the journey is far, we come together to contribute as a group for a long vehicle truck to bring them.

MCM Seller: They are brought from villages around us like Nkwanta, Kwofu, we have Nnekwa, and so on and so forth, many villages. Our means of bringing them here is usually the tro-tro. We arrange ahead of time, if we are in shortage before we even travel to the next village. We created stronger cages where we house our animals.

KNM Seller: We go to Borjuase, Bontrase, we go to Oda, Obuase and Adubaise, Navrongo, Bolga and its environs, Tamale, and beyond Ghana, Burkina Faso. Depending on the type of animal products in question, whether wildlife or livestock, the animals are either captured in the bush or reared at home for final usage. The wildlife are usually entrapped and killed with either a gun, knife, bow and arrow, javelin, or catapult, etc. They are then moved from the bush to the storage area depending on the means of transport available. They are then processed either on a small scale or large scale and then stored for sale or consumption.

AO: Workers at the slaughterhouses go to the market to buy the animals especially, the cattle.

VO: Basically, most come from the Northern Region, Burkina Faso (especially the giant ones) and Mali. We used to have designated quarantine stations but I doubt if they are functional. Unlike in Bawku where there is a livestock market where animals are taken to after purchase for vets to assess their health status and issue permits after which they are transported in trucks.

A Market Chief From Bolgatanga Goat and Sheep Market: The animals are usually brought from nearby communities, districts, and within the municipality. There are two types of animal production that one is likely to come across in the Upper East here; they are commercial and smallholder production. The animals are mostly kept in the homes of their owners, so any time the need arises; the farmer decides to take one or more to the market to sell depending on the financial demand. The animals are

taken to the markets by tricycle; motorbikes, bicycles, or on foot, and all of these depend on the number of animals they are taking to the market. There are no processes being done to the animals before they are taken to the market.

A Market Chief from Bolgatanga Cattle Market: The animals are brought from both far and near villages, districts, and within the municipality. Some of the producers grow the animals for commercial purposes and some grow them for substantial purposes. Most of the animals are housed in the producer's homes and therefore any time the need arises we just take one or more to the market with either a tricycle, motorbike, bicycle, or walking, without any preparation. The stakeholders involved in the process are the animal producers, middlemen or brokers, animal dealers, the butchers, and consumers. We have not received any hunters in abattoirs before and the producers are animal growers, the middlemen are the people who connect the producers to the animal dealers, and the buyers are animal dealers, the vendors are those who come to the abattoirs to buy meat in small quantities to sell to consumers at vantage points, and the consumers are people who come to the abattoirs to buy the meat to prepare their food for consumption.

A Market Committee Member: Basically there are four people usually involved at each stage of the supply chain, and it is their primary source of income. We cannot tell exactly how much the profit is distributed among them, but to me in terms of percentages, it will be 80%, 5%, and 15%.

Makola No. 2 Market: There are the licensed hunters, who capture and slaughter the animals from the forests. There are also other hunters, who are unlicensed and, therefore, work for the licensed hunters. Other stakeholders involved are the families of the hunters, who smoke and prepare the meat for sale to the middlemen. Meat sellers are also involved. They purchase the meat either directly from the hunters, or from the middlemen and sell them at the market. Consumers (mostly chop bar operators) buy from the market for individual consumption, for their families, restaurants, hotels, or bars.

Stakeholders in the Volta Region noted that cattle come mainly from Togo and the northern part of Ghana, where it is believed that cattle are brought from Burkina Faso and Mali. There are also Fulani men who roam with their animals and sell them at various markets in the vicinity. It is known that the local cattle breeds are shorter and not common among the cattle sold in these markets. Goats, sheep, fowl, pigs, and other animals come from farms and homes in the villages near the markets.

Reproduction is mainly of a random type; few farmers choose which animals do the breeding. From the interviews, it was indicated that fewer than 10% of the farmers pick which male mates for reproduction purposes, and harvesting is by age, where only matured animals are sold or slaughtered. For cattle, they are herded to the transaction grounds or homes by the owner to the buyer who gathered them at a point for a vehicle to convey them to the next destination. Fulani men also herd the animals straight to the market. Goats, sheep, and other small domestic animals are chased to be captured, kept in a pen, then transported to the market grounds by walking or vehicles. Slaughtered animals may be smoked or sold fresh. The smoked ones are prepared in homes noted for animal business, for example,

the grasscutter farmers and bushmeat dealers. Cattle in particular are slaughtered in the abattoirs, where hygienic measures are put in place to prevent zoonotic disease transmission. Veterinary and other animal health officers are punctual at the abattoirs and put in place all the animal slaughtering and processing measures set out by the Food and Drugs Authority and Veterinary Services Directorate.

Animals come into contact with many people throughout the process. Stakeholders involved in the live animal and animal products are animal owners, Fulani men, market lords or heads, butchers, random buyers, animal health officers, meat sales agents, food vendors and operators, consumers, and the government through the district assemblies. There are indirect players such as the Forestry Commission, Ministry of Food and Agriculture, and the Food and Drug Authority, who may work with the Veterinary Services Directorate, the Environmental Health Department, and the District Assemblies. At each level of the process, there are a number of parties engaging with the animals including the animal owner, a mediator, the buyer, butchers, drivers, and “gathering-boys” who load the animals into the vehicles (anywhere from one to ten, depending on the number of animals involved) at the market ground level. There are another five to 25 at the abattoir level where the animals are slaughtered, processed, and sold to consumers. At the abattoir, additional people include slaughterers, flayers and singers, butchers, cleaners, and buyers. These animals are mainly for food in homes, restaurants, and other eating places like the chop bars common to cities in southern Ghana, so the contact between animals, market stakeholders, and consumers is both quite direct and dispersed. In a few cases, respondents agreed that animals may be obtained for ritual purposes such as wedding ceremonies and funerals, or as gifts and for breeding.

On-site interviews revealed some further causes for increased investigation of public health awareness and hygiene practices in animal market contexts: A grasscutter farmer and a bushmeat dealer interviewed believed that zoonotic disease transmission is impossible once an animal gets them, and that if there was a zoonotic disease in an animal or carcass, then the animal must have had it in its original habitat. However, the rest of those interviewed believe that zoonotic disease development and transmission is possible at each point of contact and processing in the live animal or animal product market circuitry.

The number of people involved at each level varies within the chain of production in the animal markets throughout Ghana. As interviewees attested, the animal market is their main source of income and the current COVID-19 pandemic has impacted their profit. They also reveal cost points such as inspection fees:

Tulaku Market: Most of the animals are obtained from the local hunters or the livestock farmers. The middlemen go to the rural areas and bring them to the cities (this market) to the market vendors and consumers. This is the sole source of income for each agent and at every stage, there is a marginal profit obtained by the agent.

Madina Market: The number of people involved at each level may vary but each level obtains a fair share of profit, with the original farmers having the least amount of profit. For most of the people involved in this trade, it’s mainly their source of income.

Makola No. 2 Market: The number of stakeholders involved vary, depending on the operations of the sellers. The number reduces when the vendors bypass the middlemen and buy directly from the hunters. All the various stakeholders obtain their profit fairly at each stage. For most of the stakeholders, it is their main source of income.

CCKM Seller: I will say those who sell the live animals, the sanitation officer, the veterinary officer and those who slaughter to sell. I don't really know of the economic benefits within these levels but for those who sell the live animal, the business has gone down due to the pandemic; we are rather making losses than profits. This is our main income.

KNM Seller: The number of people involved at each level of the chain of production varies, the same can be said for the level of profits for the stakeholders at each level. The veterinary doctor, the town council officer, and an appointed senior seller among them does some inspections periodically. It is sometime expensive, you have to pay people throughout the process of inspection and ensuring you do not have trouble with the law. I do not make much profit anymore but do not sleep hungry. This is the only work we do for a living, there is no other business. The little we get we take it home to feed our wives and children.

AO: I cannot figure out the number of people who are involved at each level within the chain of production. With the butchers, this is their primary source of income. With the animal farmers, that might not be their primary source of income because some of them farm both animals and crops. At the various levels, each person gets his separate profit.

VO: Butchers, animal owners, transporters, off-takers, vet staff. [It is] very profitable. Animal owners gain their profit, vets, the buyer, the end user, transporters and people who cut fodder (animal food) for the animal also benefit from the market.

Market Supporters, Detractors & Competitors

Within Ghana, the markets are supported by the market chiefs, who control prices and ensure sick animals are not brought to the market. They are also supported by the district/municipal assemblies, the Veterinary Service Directorate, and the Ministry of Food and Agriculture (MoFA). Competitors of these markets are the importers of animal products such as chicken, gizzard, sausages, etc. [As noted earlier, there is a growing demand for frozen meat in Ghana.] During our interviews with the Agricultural Officer and Veterinary Officer, they noted that the supporters and defenders included the veterinary staff and some NGOs such as Modernizing Agriculture in Ghana (MAG) and The Adventist Development and Relief Agency (ADRA).⁴⁵ NGOs are particularly involved in improving the welfare and market chain practices including hygiene measures. Interviews and site research indicated that market stakeholders do not always agree with NGO interventions and recommendations, and there are also [criminal actors]

45. MAG: "The Modernising Agriculture in Ghana Programme," Ministry of Food & Agriculture, Republic of Ghana, accessed October 4, 2023, <https://www.csir.org.gh/index.php/r-d/special-projects-programmes/mag>.
ADRA: "ADRA: The Adventist Development and Relief Agency (Ghana)," development aid, accessed October 4, 2023, <https://www.developmentaid.org/#/organizations/view/30441/adra-adventist-development-and-relief-agency-ghana>.

who perform unlawful slaughter and steal livestock, who are noted as part of the arguments of market detractors.

Veterinary Service Directorate: It is our mandate to support and defend animal markets in the region. We teach them the basic hygiene rules and practices and help prevent any disease outbreak.

Animal Production Directorate: We support animal markets by making available the right breeds, especially for livestock and small ruminants for local pastoralists. We support them with policies such as the Ghana livestock development policy.

Wildlife Division: We support animal trade by monitoring the hunters, exporters and importers of wild animal products. We generally operate with what is stated in the Wildlife Conservation Law (1989) and ensure that the locals comply with it.

Market Site Risk Analysis & Mitigation Summary

There is risk of disease transmission at all stages of animal handling. There is significant risk at the slaughtering stage. At the transportation stage, animals from various locations are put together in trucks for days. This puts them at risk of transmitting diseases among themselves and caregivers. Veterinary and Environmental Health Officers normally inspect the health status of live animals before they are slaughtered and sold to consumers, and early detection was identified as one of the ways to prevent the spread or risk of disease transmission among animals in the central region animal markets. Veterinary and sanitation officers are tasked with monitoring a broad spectrum of issues through transportation, storage, and production phases, all of which are intended to prevent disease transference by checking animals at slaughterhouses prior to slaughter. Regulations and enforcement are needed to minimize risk of infection among animals. Interviewees noted that the intentions and protocols for avoiding zoonotic spread are in place, though also note various challenges. Further regulatory challenges are noted in the subsequent section, as well.

Municipal Veterinary Officer: We ensure that live animals comply with various safety measures to decrease the risk of animal–man disease transmission in the municipality. We provide care for sick animals, both on the farms and in the markets. We ensure that sick animals are isolated and are not allowed to be sold to the public. We also inspect all animals to be slaughtered, and all meat before it leaves the market.

Municipal Environmental Health Officer, ASHMA: We are stationed in most of the live animal markets and work closely with the Veterinary Officers to ensure hygienic practices are adhered to at all the stages of animal and animal product handling, to prevent contamination of animal products.

Animal Production Directorate: We as the Animal Production Directorate (MoFA) normally collaborate with Veterinary Service Directorate, train livestock (large and small ruminant) farmers on how to breed,

handle, and manage their livestock while protecting themselves from contracting diseases from sick animals. We also monitor these farmers to ensure they practice what they are being taught.

Wildlife Division: There is the possibility of transmitting diseases between animals and humans, but preventive measures are taken, otherwise, the animals cannot be sent to any other country or cannot be exported without the requisite veterinary interventions. But, like you said, as for zoonotic diseases, you can never rule it out. We have different types of zoonotic diseases; some of them are fatal, others are not. For instance, there are some particular types of worms or mites that can be transmitted from humans to animals and some [from] animals to humans. Most of the time, these things are screened for before you are allowed to send the animal out.

CCKM Seller: When we detect some signs early, we inform veterinary doctors; they come to also check on them and sometimes take them away for treatment. Aside from that, we also separate the sick ones from the healthy ones sometimes to prevent further infection.

MCM Seller: It all boils down to the veterinary officer and the sanitary inspectors. Sometimes if the animal isn't well, the Veterinary Officer won't allow you to slaughter it. The Veterinary Office will keep the animal away from other animals and humans, and treat it till it gets better, then gives it back to you for slaughtering.

KNM Buyer: The path along the chain where there may be increased risk of disease transmission could be the storage and processing levels. Generally, the storage conditions of most producers leave much to be desired. It is similar with the point of processing, which is always usually not hygienic. Regulation is key in minimizing such risk.

AO: Pressure points can be from the transportation of animals to the market and then at the slaughterhouse. Then during transportation from the slaughterhouse to the markets or homes. Before animals are killed at the slaughterhouse, a required officer will observe whether the animal is diseased. After slaughtering, he also observes the intestine to make sure that it does not carry any disease that can affect the public. It is not everyone who sends his animal to the slaughterhouse for observation. It is even required that animals which are killed at home should be sent to these meat inspectors at the slaughterhouse for observation. It is a necessary step to prevent disease transference by checking animals at slaughterhouses for diseases before they are slaughtered.

VO: The market and the holding pens. Some of our staff occasionally go around the market to see which animals are sick or healthy, as stakeholders won't allow the mandatory quarantine of all animals for 21 days. Individuals are advised not to introduce new animals to the one already in the pen to prevent spreading of zoonotic diseases.

The Veterinary Officer (Upper East Region MoFA Regional Director's Office): There are two major diseases noted at the abattoir, and these are anthrax and TB. For the anthrax, the pressure points are the abattoir where the animals are slaughtered. Anthrax are spores, and during slaughtering or dressing of the meat, people can inhale it and get infected. And for TB, the pressure points are where the infected animal is housed and during transportation. Steps are being put in place to minimize the risk of getting infected. They conduct both anti-mortem and postmortem examination, and if the meat is infected, it is condemned and not passed for consumption, and if it is an animal, they ask the animal producers to go back and treat them.

REGULATORY APPROACHES AND CHALLENGES

Existing Policies, Regulations, and Enforcement

Several policies and laws are in place designed to regulate live animal markets and zoonotic disease risks:

- The Food and Drugs Act (1992)
- The Public Health Act, (2012)
- Wildlife Conservation Law (1989)
- Livestock Development Policy (2016)
- The Meat Inspection Law (1999)

The Food and Drugs Act (1992), the Public Health Act, (2012), the Livestock Development Policy (2016), and the Meat Inspection Law (1999) govern the state of animals and animal products through the supply chain. The Wild Animal Preservation Act of 1961, updated as the Wildlife Conservation Law in 1989 and at the time of writing slated for further modifications as of 2020, also regulates which wild animals can be hunted and when they can be hunted. Most of these laws are old and in the process of reform. These regulations make acquisition of permits and veterinary checks mandatory. The Regional Veterinary Officer, Environmental Health Service Officer, Forestry Commission, and Animal Production Officer of the MoFA mention the Public Health Act, 2012, as the regulation instrument currently governing animal markets and animal market supply chains in the country. They also indicated that there is a new policy in progress believed to introduce further modifications to the practices of the animal business. Some of the specific regulatory parameters include:

- Wild animals cannot be hunted from August to December, when they are known to be pregnant and must be allowed to reproduce.
- All meat must be inspected by the Veterinary Service Directorate.
- All live animals must be inspected and cared for by the Veterinary Officers.
- Animals must be slaughtered under hygienic conditions, under the supervision of the Veterinary Officers and environmental health officers.
- Buyers and sellers must have movement permits.

Interviews with government agencies and field site stakeholders provided further contextual information about how regulation proceeds in practice throughout Ghana:

Wildlife Division: When you are exporting an animal, maybe, you are bringing it from the bush, let's say, somewhere in the Volta Region, the first thing to do is to get your documents from the Wildlife Division, indicating that the animal is allowed to be exported because we have some species, you cannot trade in them at all. So, once that is ascertained, you would send the animal to veterinary services and the veterinary services would then take the necessary samples and screen the animals for whatever diseases they feel are of significant importance to them. They also then give you the permit to be able to export the animals or import them. So, when that is done and your animals are not having any diseases, you are given the permission to export. If they find anything wrong with them, then, they will have to advise you as to what to do: either they are treated or quarantined for a certain period and observed before they are sent to wherever they are supposed to go, or they are brought into the country.

Veterinary Service Directorate: Oh, on that note, we have now drafted the One Health policy document. We have the technical working group and the main institutions involved are the Ministry of Health, Ministry of Food and Agriculture, Ministry of Science, Technology and Environment. These are the main institutions to see to it. There is some sort of collaboration, but it's not legally bound and that's the idea that we are now pushing for this One Health policy document. Because globally, that's the way to go and COVID-19 is a classical example, where [the] Veterinary Service Department is fully involved in the testing of samples because we have laboratories. We have P3 laboratories in three places in the country: Accra, Takoradi, and Pong -Tamale. First class P3 laboratories. P3 laboratories in the country are found at Noguchi, KCCR, and the Veterinary Services. These are the places who have the P3 laboratories. So we are trying to make it legal, formal.

Makola No. 2 Market: I'm not a hunter but what I do know is that, during some periods, usually around August to November, they are not allowed to hunt most of these wild animals. The only exception is grasscutters. It is believed that during that period, the animals are pregnant and should be allowed to give birth.

Analysis of Application & Barriers to Enforcement

There are conflicts between institutions regarding their roles and responsibilities. Due to overlapping duties and unclear role definitions, regulation and enforcement can be improved. Some interviewees also noted that the laws themselves are unclear in some cases. The end result is that some Ghanaian animal products are considered undesirable on the international market due to non-compliance with standards. Animal and animal product sellers and processors resort to a variety of means to bypass the laws and standards, and often go unpunished. Still another issue is that the inspections are not free, which incentivizes avoidance. There were contradictory views as to the enforcement and effectiveness of the regulations.

Veterinary Service Directorate: They don't allow us to do our work. Animal and meat inspection is supposed to be anatomical, yet they let the environmental health officers do these inspections at the markets instead of us. Environmental health—how can they know anatomy? This is really causing problems for us. The laws need to be reviewed so that our various roles can be clearly defined. The sellers themselves also contribute to the problem. They will do all sorts of things to bypass the laws.

Wildlife: It is not common to find people not obliging to the regulations. They know what is expected of them and anyone who flouts it is denied his/her rights.

VO: Regulatory enforcements are very effective even though regulatory staff are not many. Also [it] helps economically as sick animals are prevented from traveling to other regions. Anyone who violates these enforcements will be arrested. You cannot stop a vet from examining your animal before slaughter.

A stakeholder from the Upper East Region noted that regulatory enforcement is terrible, and there is no known punishment for those who violate these rules. They instead advise perpetrators and let them go without penalty.

The government, through its agencies such as VSD, the Wildlife Division of the Forestry Commission, and district/municipal assemblies, regulates the activities of these markets. Some income is generated from the markets through taxes and inspection rates. Some interviewees noted a former corruption issue with government-owned farms that has since abated given the collapse of those facilities (prior to COVID-19). Public corruption continues to influence the operation of animal markets. Sellers influence officials by paying bribes, and inspectors are not thorough with their work because they are more concerned about getting paid.

Interviews and observations from the Volta Region corroborate the points about planned governmental oversight. The live animal and animal products markets are supervised by the government through the ministry of Food and Agriculture (MoFA) and the Food and Drugs Authority (FDA) at both national and local levels. The MoFA works through its VSD and Environmental Health Service (EHS) in collaboration with the FDA. The VSC and the EHS sees to [the] implementation of regulatory instruments at the local level where they work hand in hand with abattoirs, live animal markets, and the meat markets in the municipalities and district assemblies. The government also sees to income tax through the district and municipal assemblies; this covers the live animal markets, abattoirs, and meat markets.

The vast majority of interviewees agreed that animal market stakeholders operate outside the law, indicating for example that slaughtering and butchering take place in homes without animal health or environmental health inspectors present. Participants in the cattle market also hinted that a few animals get to them through unapproved channels along the Ghana–Togo border, and that animals brought in through such routes do not go through any animal health inspection. One grasscutter farmer agreed that animal health services' regulations are not effective, and he has never had any visitation from the authorities in charge of animal health inspection. Also, the CEO of the bush canteen (chop bar) indicated

that, although the animal inspectors do visit from time to time at her end, no such inspections are done in most areas where hunters sell their game.

Veterinary Service Directorate: We ensure that animal and animal product sellers comply with the basic rules and regulations associated with the business. Defaulters are reported to the police and sanctioned by the laws of the country.

Municipal Environmental Health Officer, ASHMA: Normally, we check and ensure that before animals are slaughtered, they pay a fee (slaughtering fees) to our officers and even Vet Officers. These monies go to the assembly as revenue. There have been cases where our officer was caught taking bribes from meat sellers to avoid paying fees. We don't have a well-structured monitoring system, everything is done manually here, so issues with bribes and corrupt practices can easily be carried out.

AO: There is regulation by government agencies. It is possible for animals to come to the market without observation by regulatory bodies. Some people do not kill the animals at the slaughter houses which are devoid of observation by meat inspectors.

VO: Huge regulations. For instance, for disease control. Regulation on markets helps to easily trace outbreak of diseases. Regulation helps in taxation. Public corruption was on the rise during the time government-owned farms existed, but not these days as most of these government facilities have collapsed.

Senior Regulatory Officer at FDA: Government has a supervising and regulatory role over animal markets and it is centralized. The Public Health Safety Act, Act 851 part 6, 7 and 9 established in 2012 spells out public health safety rules and regulations. They derive revenue from animal markets through the district and municipal assemblies. The subtle nature of corruption makes it rear its ugly head in all manner of human activities. She made us understand that FDA was trying to establish a product and public safety unit as well as [an] environmental sanitation unit, so that these units will take care of the animal markets and its activities. People involve in this in different ways, through influencing market chiefs for space, paying revenue officers without collecting receipts so as to under-declare the number of animals brought to market among others.

An Upper East Market Chief: There is no place without corruption, and this is not an exception, I will be honest with you. But for the relationship and other things me, I cannot tell, maybe my colleagues can help.

As noted, there are numerous laws governing the operations of animal markets. However, public awareness of these laws is one problem. And those who are aware may try to bypass them. In the regions visited, some animals enter the market without checks. Some stakeholders operate without proper permits. Some bribe police officers to pass through the borders/checkpoints and bring goods to

the markets. On the other hand, those who agreed they had knowledge of regulations governing the live animal and animal products markets indicated that the policies are very effective and working as it gives punitive measures to offenders.

Veterinary Service Directorate: The laws are there. Check the Food and Drugs Act 1992, Public Act Ghana 2012, Wildlife Conservation Law 1989. We have standard laws but where is the empowerment? People always find ways to operate outside the law. Awareness is another big issue. How many of our local sellers know these laws? Quite a few!

AO: It is possible that animals will enter the market without any checks, or it will not be slaughtered at the slaughterhouse. If this happens, animals with disease will not be identified. Also, it is an offense to slaughter an animal in the house before sending it into the market.

VO: Some people don't keep movement permits and get away with it as the police take bribes to let them through borders/checkpoints.

Navrongo Sheep and Goat Market Chief: To a large extent, because most people in the market here are not complying with the rules and regulations governing the markets and some people do not know that such rules and regulations exist, and the enforcement of those rules and regulations are not effective.

PROSPECTIVE REFORMS

Future Policy Solution Drivers

Effects of COVID-19

Although livestock markets seem not to have been affected by the COVID-19 pandemic, wild animal markets have been greatly affected. The outbreak of Ebola resulted in a very significant decrease in the purchase of “bushmeat,” as the public became increasingly aware of zoonotic diseases, and the COVID-19 pandemic has aggravated the problem in these wild animal markets. Most sellers had either abandoned their stalls or ventured into other businesses. There were just about two or three wild animal product sellers in markets where there would have otherwise been many. Others predicted that COVID-19–related changes and trends in the next few years in the animal business will include a sharp decline in production and consumption due to consumer fears and lower rates of supply and demand. There have been significant closures of sites such as the Ho Abattoir, as well. The general response of shutting down travel and markets was also significant, though cross-border goods transport was not shut down.⁴⁶

Veterinary Service Directorate: COVID-19 has changed everything, even the type of animals found in our markets. Hardly will you see grass-cutters in our animal markets because many perceive it may contain the virus.

46. See as well: Lewis Abedi Asante and Richard Odarko Mills, “Exploring the Socio-Economic Impact of COVID-19 Pandemic in Marketplaces in Urban Ghana,” *Africa Spectrum* 55, no. 2 (2020): 170–181, <https://journals.sagepub.com/doi/pdf/10.1177/0002039720943612>.

Wildlife: It has affected the trade of wildlife seriously because no one knows what animal can bring the disease in. Apart from that too, flights are limited so you can't even get flights to fly your animals at the time you want so it has affected every aspect of the business.

CCKM Seller: There was a sharp decline in production and consumption, the buying; everything came to a halt but has slowed down because of the restriction on movements of the animals where they go and take them from, they can't go to Kumasi or Yeji during the pandemic times to bring the animals, yeah so during the pandemic even up to now, it's now that I will say that maybe it's surging again. Yes, in terms of the market what might change over the next few years to come is that as it is now then I will say there will be a decline in production in the economic aspect of the business.

MCM Seller: Animal markets have been affected largely on the account of fear. Consumers feel because COVID-19 came through animal products, it's dangerous to consume more animal products especially imported ones. The emerging trend is that players in these markets are recognizing and becoming conscious of zoonotic diseases.

KNM Buyer: Generally, COVID-19 has lowered the rate of demand and supply for which the animal market is inclusive. The animal market in the years ahead, however, is likely to face some lower levels of patronage especially in terms of meat for food. This is because emerging studies keep admonishing humans to reduce the intake of meat to stay healthier.

AO: It has affected the income of poultry farmers and pig farmers because schools and other organizations who buy from them were closed.

VO: It hasn't changed much in Ghana except that it makes us high alert as a result of the collapse of animal farms and meat processing plants in Europe and America. Theft is a huge bother as animal thieves don't go to the market with fear of being caught. We need to regularize livestock markets together to enable easy monitoring of animals. A common market is needed. Sellers should have receipts for buyers to enable easy tracing back.

A Cattle Trader (Bawku Market, Upper East Region): There is no noticeable change in animal markets as a result of the COVID-19 pandemic. People continued their trading activities immediately the COVID-19 measures imposed by the government were eased. These markets may not see any change as the population seem not to relate their interaction with animals as posing any risk in getting COVID-19.

Large-Scale Trends

As previously noted in the case of increasing demand for frozen food, urbanization and westernization greatly influence supply and demand for animals and animal products. With the influx of

more western culture and the introduction of fast-food restaurants in this region, demand for animals and animal products has highly increased. More people opt for meat and their fatty products and reject the healthier options. The demand for “bushmeat” and other wild animal products has significantly decreased due to outbreaks of zoonotic diseases. The biggest trend of animal markets is lifestyle changes, focus on nutritional health, and the demand for meat and health status of individuals.

Veterinary Service Directorate: It’s quite common to find a lot of foreign animal products in the country and region. Many of these products are in high demand due to westernization, taste and preference. It’s quite sad that many of these products sneak into the country and are consumed. Wildlife animal products such as the local “bushmeat” has significantly decreased due to awareness and outbreak of zoonotic diseases in the region and even on the African continent.

MCM Buyer: The biggest trend driving growth in animal markets is lifestyle changes as a result of the increase in the number of middle class.

KNM Buyer: As earlier indicated emerging diseases among the young and old have put the focus on nutritional health. Health promotion materials in recent times keep admonishing humans to reduce the intake of meat, and in some cases, abstain completely from feeding on certain animals.

VO: Globally, credibility is of concern, as we report to international bodies such as OIE, AUI, and other regulatory bodies who check if we are doing things right. Demand for meat and the health status of individuals also affect the national and global driving demand for animals.

Proposed Reforms

Reforms such as a clearer definition of the roles of various regulatory institutions, proper enforcement of existing regulations, and making animal and animal product inspection free and compulsory, could help to mitigate the risk of zoonotic disease transmission. The introduction of veterinary doctors, modern technology for food processing, and regulatory bodies were measures mentioned by individuals at the central animal markets as well as by agriculture and veterinary officers. These types of reform would mitigate the risk of zoonotic diseases arising from the animal markets. Quarantining of new animals should be more strictly enforced to enhance biosecurity. And a public education mission of informing people of the importance of hygiene practices might also improve things. Such mitigation measures would likely cause significant cultural changes, compelling stakeholders of the live animal and animal products markets to undertake practices they may not be currently. As one example, those raising animals at home would have to bring those animals to the abattoirs for animal health officers’ inspection before slaughtering.

Interview respondents believe that the market was primarily affected by the social distancing measures, but not in terms of the number of animals killed or sold. They also asserted at the time of writing that market players would adjust to the pandemic in time. Respondents do not believe

deforestation and weather changes do not affect the demand and supply of live animals and animal products. And while food/health inspectors do inspect live animals and animal products before they are sold to the public in organized markets, informal market transactions such as those taking place along roadsides and in homes do not go through any formal inspection and so present a major reform target. Stakeholders interviewed stated that they practice general sanitation norms to prevent animal to human transmission of disease. Some of the interview responses are particularly illustrative of the dynamic challenges the Ghana case presents, including the following:

Veterinary Service Directorate: We wish the laws would have a clear definition of roles or the various regulatory institutions so that we can all do our work and help mitigate any risk of zoonotic diseases in our local animal markets. We now go by the One Health concept, all on board. Previously, we used to work in isolation, but currently it's a collaborative work with other key stakeholders even at the local level.

Animal Production Directorate: We work closely with the Veterinary Service Department on anything related with zoonotic disease. If everyone would do their part diligently, we wouldn't have any issues at all.

Municipal Environmental Health Officer, ASHMA: People need to change their mindset about money, money, money, and do their work properly. The bribes and things like that will not help us. Also, if the inspections were free and compulsory, people would not run away from it. Some of them don't want to pay the money.

KNM Buyer: The regulatory institutions must enforce rules on the processing and sale of animals and animal products to make it safer for consumption. Seasonally, when some zoonotic diseases are in season, restrictions should be placed on the importation, or local production of such products increased.

AO: Police checkpoints should ensure that those carrying the animals have papers that are certified by a veterinarian that the animals are not carrying diseases.

VO: We have to enforce the quarantine system, as this improves biosecurity. Quarantine stations and borders should be active to prevent entry and exit of unidentified animals.

An Upper East Market Chief: Clear guidelines on rules and regulations that govern animal markets that are readily available to the general public. The environmental health workers should strictly enforce proper hygiene practices at animal markets.

An Upper East Market Committee Member: Animal handling should be carefully looked at so as to separate traders from their animals. Animals should be probably kept and taken care of by Veterinary Officers who should be assigned to each animal market.

Live animal and animal product markets can serve as breeding grounds for zoonotic disease that spread from animal to man and vice-versa. Market stakeholders agree that the government must tighten measures to ensure compliance with the rules and regulations governing animal markets and animal processing activities. To motivate and support Ghanaians' efforts to prevent and monitor zoonotic disease development and spread, there should be thorough education on the dangers of zoonotic diseases. Tighter mitigation measures should be put in place to curb noncompliance with rules and regulations governing the animal markets.⁴⁷

ACRONYMS

Following is a list of commonly-used acronyms:

AO	Agricultural Officer (Central Region Interviewee)
APD	Animal Production Department
CCKM	Cape Coast Kotokuraba Market
KNM	Kasoa New Market
MCM	Mankessim Central Market
MDAs	Ministries, Departments, and Agencies
VO	Veterinary Officer (Central Region Interviewee)
VSD	Veterinary Service Department

47. The live animal and animal product markets are dominated by men, probably due to cultural practices and traditions that prevent women from certain activities such as butchering and herding of cattle in particular.

IMAGES

The following pictures depict the Dzodze cattle market, the Ho Abattoir, the singeing of hides, legs and head of animals at the abattoir, and slabs for meat inspection at the abattoir.



