

### Impact of covid-19 on livestock production in Nigeria: A review

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#### Abstract

*Corona virus disease 2019 (Covid-19) has been major threat for the sustainability of human existence. In understanding the gravity of the situation, every state has undertaken special steps to fight against the pandemic mostly with measures involving social distancing and self-isolation, restriction in travel and trade. This is done in all the states to avoid the spread of the virus. All these strategies to combat against the pandemic have greatly affected an important economic sector such as livestock production. Livestock production is one of the main agricultural sector in endorsing availability and accessibility of food and human development. Livestock plays an important role in the economic system, provides food and feed material, creates employment opportunities to a very large population; meet the animal protein demands of the economy. At present, livestock industry has included game reserves, recreational centers, marketing of livestock, processing of livestock, distribution of animal products, research institutes etc. are all accepted as component of modern animal production. This review intends to document the impact of Covid-19 pandemic on livestock production and food security as it primarily involves the sustainability of human life and the economy. It was observed that the Covid-19 pandemic protocols and provisions interferes with the supply chain of the market with impaired production and distribution.*

**Keywords:** Animal production, Covid-19, Pandemic, Food Security, nutritional; Egg, Meat.



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#### Résumé

*La maladie à virus Corona 2019 (Covid-19) a été une menace majeure pour la durabilité de l'existence humaine. Comprenant la gravité de la situation, chaque État a pris des mesures spéciales pour lutter contre la pandémie, principalement avec des mesures impliquant la distanciation sociale et l'auto-isollement, la restriction des voyages et du commerce. Cela se fait dans tous les états pour éviter la propagation du virus. Toutes ces stratégies de lutte contre la pandémie ont fortement affecté un secteur économique important comme l'élevage. La production animale est l'un des principaux secteurs agricoles en faveur de la disponibilité*

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*et de l'accessibilité de la nourriture et du développement humain. L'élevage joue un rôle important dans le système économique, fournit des denrées alimentaires et des aliments pour animaux, crée des opportunités d'emploi pour une très grande population ; répondre aux besoins en protéines animales de l'économie. À l'heure actuelle, l'industrie de l'élevage comprend des réserves de chasse, des centres de loisirs, la commercialisation du bétail, la transformation du bétail, la distribution de produits d'origine animale, des instituts de recherche, etc. sont tous acceptés comme une composante de la production animale moderne. Cette revue vise à documenter l'impact de la pandémie de Covid-19 sur la production animale et la sécurité alimentaire car elle implique principalement la durabilité de la vie humaine et de l'économie. Il a été observé que les protocoles et dispositions relatifs à la pandémie de Covid-19 interfèrent avec la chaîne d'approvisionnement du marché avec une production et une distribution altérées.*

**Mots clés :** Production animale, Covid-19, Pandémie, Sécurité alimentaire, nutritionnelle ; Oeuf, Viande.

### **Introduction**

Livestock production, in its numerous traditions, plays a very important role in the food systems and making use of infertile land for crop production. Animals turns by-product like (bone, meat, fish, feather and others) into edible food. They contribute to crop yield and as well revolve inedible crops like (straws from grains and leaves, leaves from plants, grasses and legumes etc) into extremely nutritious food and protein-rich foods (FAO, 2017). The total animal proteins consumption of an average Nigerian is about 15-20%, which is different from the 33% recommended. (Food and Agricultural Organization FAO, 2001; Yusuf, *et al.*, 2016). Nigerian is faced with the problem of malnutrition with under-nourishments, to successfully fight this problem, 20g of animal proteins per person per day is required or 7.3 kg per year can be supplied. It may be effectively achieved by an yearly utilizations of 33 kg lean meat or 45 kg fish or 60 kg eggs or 230 kg milk, respectively (FAO, 2019). This could partly be as a result of the high cost of finished feeds resulting to increase in the prices of livestock and its products. This is due endemic or pandemic diseases such as Corona-virus disease-19 (Covid-19) and consequent rise in the cost of animal protein beyond the purchasing power of most

people (Oloruntola *et al.*, 2016). Feeding is an essential in animal production as it takes a major share of the total costs of intensive animal production schemes (Akanbi *et al.*, 2020). Asghar *et al.* (2000) reported that poultry production is an increasingly important agricultural industry in the world, however, as beneficial and interesting as poultry seems, this sub-sector is set back with high prices of farm input particularly the cost of feed. Any farmer aims to produce a healthy animal and its products at the least cost without incurring much money on drugs and be able to get it across to readily available customers. Livestock need dietary supplement daily to improve their growth, so it is the necessary to balanced diets for animals to enhance their product performance as well as their immunity. Adeniran *et al.* (2019) revealed that animal agriculture takes many forms however; the majority of large animal agriculture is to produce high-quality meat, poultry, eggs and other products, animal processing industry is a constantly changing, consumer-driven industry that provides numerous jobs for the economy. Livestock production systems have both positive and negative effects on the natural resource base, public health, social equity, and economic growth (World Bank, 2019). Consequently, the economic

impact of diseases and the cost of control measures are high and becoming higher. Also, it is sometimes necessary to use control measures such as isolation which may greatly affect the entire livestock production and may be devastating for the poorest households for whom livestock forms a major source of income. Livestock ownership supports and sustains the livelihoods of an estimated 70% of the rural poor (LID, 1999; World Bank 2019). These livestock producers are mainly women, for whom livestock plays an important role in the improvement of status and represents one of the most vital sources of income (DFID, 2000; Perry and Grace 2009; Thornton, 2010). Livestock ownership also tends to increase the consumption of animal protein and micronutrients and creates employment opportunities beyond the immediate household. Hence, how the animal products can be made available in the future or similar occurrences.

***Impact of Covid-19 on food chain sustainability***

Livestock farming systems and their supply chains are challenged by many logistical supply interruptions, like most other agricultural enterprises. The COVID-19 outbreak interrupted livestock chain sustainability in different areas, from the production process to marketing and consumption of animal products. The primary production logistical interrupter was the shortage of accessing farming inputs, such as animal feed resources (Zhang *et al.*, 2020), livestock movements for pasture and water, and animal equipment, such as milking machines, vaccines, and other pivotal production inputs. Indeed, calls to stay at home and social distance have affected the humanitarian dependent services in farms, affecting the routine work and animal husbandry (low number of laborers, veterinarian visits and services, and workers in product processing).

Additionally, processing of animal products, such as milk and meat (delivery failure and decreasing processing and slaughtering capacities), presents another obstacle to the completion of the production cycle, forcing farmers to reduce production capacity and waste products (Gortazar *et al.*, 2020). The pandemic's impact on the livestock supply chain continue to affect local and global marketing process (reduced marketing opportunities, block of import/export activity, and lower purchasing power) and consumers', demand (misconception regarding animal products safety and reduced consumers' income). All of these interruptions in the livestock supply chain put the producers (farmers) at risk of not being able to continue in the field. This situation has dramatically threatened the sustainability of livestock production systems and global food security, particularly animal protein resources (FAO, 2020). Production Facilities and Farming Inputs Restrictions on import/export activities and local movements have prevented farmers from accessing livestock production inputs and given them limited marketing opportunities. The limitation of movements and the disruption of national and international trade routes drive to a substantial decrease in vital livestock farming materials and facilities, such as feed materials, replacement stocks (e.g., day-old chicks, piglets, gilts, heifers, and semen straws), drugs and vaccines, feed additives, and other livestock farming inputs (FAO, 2020). For instance, Argentina, the world's biggest soybean meal exporter, has reduced its exportation by about 50% to feed manufacturing factories, which could affect the availability of one of the most critical feed ingredients in the diets of farm animals (Seleiman *et al.*, 2020). A similar situation has occurred in Brazil, where the COVID-19 pandemic restricted both soybean and corn exports, leading to a shortage of animal diet

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ingredients (Seleiman *et al.*, 2020; FAO, 2020). Movement restrictions have not only limited international trade activity, but have also constrained access to national/local production inputs; as an example, pastoralists in Nigeria's dry lands, who depend on natural plants in pastures to feed their animals, have lost this vital natural production input and therefore pastoralist livelihoods (FAO, 2020). Many companies working on vaccines, animal health products, feed additives, milk testing kits, and spare parts of pasteurization equipment to small-scale meat and dairy producers have indicated that the reductions in fluidity and foreign exchange were other significant factors affecting the sustainability of the livestock supply chain, specifically in developing countries (AGRICLINK, 2020). There is no doubt that such reductions in the production inputs and their trade can easily hamper the productivity of animals, the profitability of livestock producers' (specifically small-scale meat and dairy holders) and the profitability and commercial sustainability of these companies themselves.

### ***Impact of covid-19 on food security***

This COVID-19 seems to strike the availability and accessibility and food value chain. It has affected all the processes which connect farm production to final consumer. This pandemic has negative impact on supply and demand for food might lead food availability and accessibility at risk (Siche, 2020). Thus, this also leads to disturbance in food supply chain and food production and hence arising in food insecurity. FAO (2020) had mentioned that, small farmer and fisher may face difficulty in selling their product which in turn cause decrease in their income and purchasing capacity. Food insecurity raised due to COVID-19 highly affects the poorest and the most vulnerable segments of the Nigerian residents FAO Q and A (2019). Presently, 720 million people are facing

chronic hunger and 213 million are facing acute severe food insecurity FAO (2020). Thus, disturbance in food access brought by pandemic affects these groups immediately and severely. About twelve (12) million children depend upon the school meals to fulfill their nutritional requirement. But due to closing of schools and suspension of school meal programs, these children are no longer receiving daily school meals which may reduce their capacity to cope with diseases (FAO, 2020).

A significant waste in food resources, specifically meat and milk, was one of the consequences of the COVID-19 outbreak. For instance, dairy farmers have been forced to throw out a million gallons of milk due to the decline in demand for milk and dairy products (Barrett, 2020). Under the new global food security situation, such waste in food resources is a horrible further crisis in addition to the health crisis. At the beginning of 2020, there were 27 million acutely food-insecure people in 35 countries in "emergency" conditions, who could potentially be on the brink of famine due to the direct and indirect impacts of the COVID-19 pandemic. In April 2020, the Famine Early Warning Systems Network Global Food Security Alert warned of the risk that populations in developing countries (such as those in northeastern Nigeria) could be challenged by famine due to the COVID-19 pandemic (FAO, 2020; FSNAU-FEWS NET, 2020). In light of this scenario, there is an urgent need to find measures and unconventional solutions to control the negative impacts of the pandemic on global food security. Specifically, the current crisis has shown the fragility of the worldwide economy even in developed countries and the possibility of an increased risk of food insecurity.

### ***Economic implications during Pandemic***

The global changes in consumption and demand for animal products, along with

increasing pressures on resources, are having some vital implications for the animal production systems. Increasing the supply of animal products can be achieved by combining an increase in the number of animals with the improvement of productivity, and processing/marketing efficiency (Rifikin, 2002). The most crucial aspect of this epidemic or pandemic is that it will always remain; human suffering and the loss of lives. Nevertheless, the spread of a virus can also have important economic implications. This aspect of the impact of epidemics and pandemics has its impacts across the economy can be vital. The total value of losses including lost income: through reductions in the size of the labour force and productivity, increases in absenteeism and as the result of individual and social measures. This interrupts program but disrupts economic activity and the intrinsic cost of high mortality incurred by a severe global influenza pandemic such as the 1918 pandemic. This could reach about 0.6 % of global income. The International Monetary Fund finds that vulnerable populations, particularly the poor, are likely to suffer disproportionately from an outbreak, as they may have less access to health care and lower savings to protect against financial catastrophe. At the regional level, a World Bank (2017) report estimates that the recent Ebola epidemic in Nigeria. Another WHO report explains further that the outbreak caused a substantial loss of growth in the private sector, posed threats to food security due to a decline in agricultural production and burdened cross-border trade with restrictions on movement, goods, and services. The estimated proportion of annual national income represented by these losses varies according to income groupings, with lower-middle-income people being more severely impacted (1.7 %) than high-income people (0.2 %).

### ***Impact of covid-19 food production and distribution***

Travel restriction had affected every stages of food supply chain with major impact on food distribution because of the lockdown. Several agricultural sectors such as crop, livestock and fishery have been hit hard by pandemic. COVID-19 has caused higher impact on livestock farming due to limited access to animal feed and shortage of labour (Zhang, 2020). Travel ban in many states has affected delivery of breeding stock of poultry. The International Poultry Council (IPC) has warned that there will be no breeding stock and hatching eggs if such travel restriction prolonged (Vorotnikov, 2020). Agricultural produce are mostly perishable in nature, so farmer are compelled to store their unsold produce for longer period of time which leads to reduction in food quality as well as increase in cost of production (FAO, 2020).

### ***Impact on animal products and farmers***

Land availability limits the expansion of livestock numbers in extensive production systems in most regions, and the bulk of the increase in livestock production will come from increased productivity through intensification and wider adoption of existing and new production and marketing technologies (Akanbi *et al.*, 2020). The prices of feedstuff such as soyabean and maize increased and affected the feed quality during Covid-19. Animals will lack the provision of adequate balanced ration when there is low input that will give rise to an output of these products due to the lockdown orders in the affected states. Consequently, farmers will have reduced income due to low production and where there is resource to maintain production output, there are low economic sales of these animal products which is forcing farmers to sell at very low prices forgetting profits due to lack or inadequate processing and storage facilities to preserve and make them available for a long period. Hence,

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there is a need for the use of existing and innovation for improving the shelf- life of products. However structural changes in livestock production systems and subsequent fast expansion, of industrial, vertically integrated, large-scale livestock production, particularly pig and broiler production in poultry farms and broiler production in Nigeria, often located close to large urban centers declined with a lesser degree. In contrast, over the same period, production in Nigeria drastically fell down. This, of course, is heavily dominated by the collapse of livestock production. The growth in white meat (pork and poultry) production in Nigeria has been remarkable and more than doubles the growth in ruminant meat. Likewise, egg production was affected in Nigeria because prices of feed doubled from ₦3,700 to ₦7,500 as a result the scarcity of feed, ration quality and quantity reduced drastically. These affected both the small scale farmers and the animal industries. Milk is secreted by the mammary gland of mammals to feed their offspring. Cow's milk is commonly used as human food, but milk from sheep, goats, buffalo, yak, horses, and camels is also used. Milk contains large amounts of essential nutrients and has rightly been recognized as nature's single most complete food deprived from children, youth and pregnant mothers who needed it most for the development of the fetus. As a food, milk serves the following broad purposes: (a) supply of energy, (b) reproduction, (c) growth, (d) maintenance and repair, and (e) appetite satisfaction but due these pandemic liters of this vital products were wasted. These affected mostly infants who require these categories in large quantity with the individual, and in some instances, not all the required quantity of the food products needed were served due to scarcity. E.g. adults no longer feed two square meals; there was no milk for infants. Infants and pregnant women suffered malnutrition due

to scarcity, limited and non-accessibility of food such as milk components, comprising minerals, vitamins, proteins, carbohydrates, lipids, and water (Haug *et al.*, 2017) which would have improved the health status of this early development of life. Likewise, egg production followed the same trend with similar regional differences in Nigeria.

### ***Impacts on livestock and their products during pandemic***

Reduced access to animal feeds: Physical distancing and requirements for additional personal protective equipment are reducing the efficiency of industrial feed enterprises. Movement restrictions and illness are resulting in labour shortages and reduced supply of raw materials or other ingredients. Disruption of supply routes has further delayed feed supply. In Nigeria, restrictions have reduced supply of feed to whole sellers which affects global trade flows. Movement restrictions and lockdown, which cripples animal farmers ability to feed their animals. Limited access to inputs and services: Movement restrictions and disruption of national and international trade routes is curbing farmer access to breeding materials and replacement stock (e.g. day-old chicks and semen). This can compromise sales for input providers. The disruption of public services (e.g. food safety inspection and animal health extension services), combined with interrupted delivery and use of vaccines and medicines is increasing the likelihood of new epidemics, including those involving animal diseases that cause major livestock losses (e.g. African swine fever, New castle disease, fowl typhoid, ) and outbreaks of diseases transmissible to humans. Limited access to markets: Closure of live animal markets in Nigeria means small-scale producers cannot sell their products. The disruption of the logistical channel and drop in demand are reducing sales and lowering prices. As a result of limited access to markets,

slaughterhouses and processing plants, farmers have to keep their stock longer leaving them with higher production costs. Disruptions of income from small ruminants or poultry are hitting women hardest, by reducing their purchases of household essentials and nutrition. Limited processing capacity: Staff reductions due to lockdown measures are constraining animal industries, given their labour-intensive nature. Compromised storage and conservation: Transport disruptions and changes in retailing and consumption habits are forcing some collectors and processors to stock up. Constrained informal businesses: This disruption removes an outlet for small-scale producers, who often lack the capacity to sell to formal markets. Constrained national transport: Movement restrictions are compromising transport, which is reducing the supply of livestock and livestock products. Delays of vehicles transporting raw materials for processing meat threaten to cause a shortage until movement bans were loosened. Reduced consumer purchasing power: Quarantine and lockdowns are constraining purchasing power, particularly that of informal workers, and in countries with little or no social safety nets. The economic slowdown and increasing unemployment have already left people, including thousands of migrant workers in Nigeria, with little or no income with which to buy food. Closure of restaurants and reduced tourism is leading to a sharp fall in demand for food by livestock sectors. School feeding programs are also suspended, which is depriving millions of children of access to food like meat, eggs and other products. Animals lack the provision of adequate balanced ration when there is low input that will give rise to an output of these products due to the lockdown orders in most of the affected states in Nigeria. Consequently, farmers had reduced income due to low production and where there is statuesque maintaining

of production output, there are low economic sales of these animal products which is forcing farmers to sell at very low prices forgetting profits due to lack or inadequate processing and storage facilities to make them available for a long period. Hence, there is a need for the use of existing and innovation for improving the shelf- life of animal products

#### **Conclusion and recommendations**

In conclusion livestock production, marketing and distribution have been affected by this pandemic. Food safety and security are the concern at present condition. The supply chain has been hit hardest by COVID-19, which causes food security of most vulnerable segment of population at risk. And also, most of the migrant, informal, seasonal farm workers are losing their jobs which may affect the demand for animal products. Therefore, the government should enforce the measures to control the pandemic without disturbing the food supply chain and considering the food security of their citizen. This review is hereby recommend that adequate processing and storage should be made available to mitigate animal product wastage and ensuring the availability of such products post-pandemic. More also, governments should encourage farmers producing both plant food, animal, research, processing and storage.

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