Livestock shortage amidst COVID-19: A case of Brunei Darussalam

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Abstract: The Covid-19 pandemic has increased food security risks in many parts of the world due to strict quarantine measures and lockdowns which have affected all stages of food supply chains. Brunei is not an exception. Prior to the pandemic, the poultry sub sector has performed better than others in the agriculture sector and was reportedly able to meet close to 100% of local demand for eggs and chicken. However there have been shortages of meat products such as chicken, lamb and processed meat in Brunei amidst the pandemic. This paper aims to review the contributing factors of these shortages. Some of the factors identified were increased of demand, cost of logistics, and cost of feed and unstable weather caused by climate change. The government has a big task ahead in not only resolving the immediate shortages but also to manage future risks. Farmers and local livestock producers require greater policy support in order to boost local production and effectively address obstacles along the supply chain in a coordinated manner. Local livestock producers must also continuously improve their competitiveness by learning and adopting new technologies in the field of agriculture not just to meet current demands but also for time to come.

1. Introduction
Globally, the COVID-19 pandemic has impacted the food systems through changes in the food supply and demand, decreasing purchasing power and the disruption in the distribution of food [1]. Lockdowns and other restrictive measures taken to control the outbreak of the COVID-19 pandemic have negatively obstructed the livestock sector [2]. There were problems in transporting live animals and animal products (milk, meat, and eggs) to markets, decreases in the purchasing power of production logistics, and shortages of labor and professional services [3]. These obstacles have led to substantial disruptions in the livestock supply chain, decreasing the economic and productive efficiency of the livestock industry [3]. The global total meat is expected to fall by 1.7% (338.9 million tons in 2019 vs. 333.0 million tons in 2020) due to animal diseases and market disruptions [1].

COVID-19 disrupted the livestock chain making it difficult in accessing feed resources and to process animal products, such as milk hindering the production cycle, forcing farmers to reduce production capacity and waste products [1]. The interruptions in the livestock supply chain put the producers (farmers) at risk and threatens the sustainability of livestock production and global food security,
 Particularly animal protein resources [3]. The cattle industry in the USA is expected to lose about $13.6 billion through 2021 as a result of the COVID-19 spillover [1].

Brunei as a globalised country is highly interdependent on the dynamics of trade in goods and services, as well as the flow of technology and capital. Food security has long been a concern for the government and its people, considering the nation’s low rate of self-sufficiency in food production and heavy reliance on food imports. The objective of this paper is to review the factors that have contributed to retail shortages of livestock supply and the increasing prices in Brunei. Food businesses first raised concerns over the unavailability of lamb and processed meat products in early September 2020 [4]. Meat prices grew by 3.0% in the second quarter of 2020 and there was significant decreases in imported livestock by 93.5% and 55.4%. This may have contributed to the overall price increase given Brunei’s reliance on imports [5].

2. Review methodology
Recent panic buying events have sparked concern over the supply of poultry and meat in particular, not only among consumers, but also among retailers and authorities alike [6]. Hence, further investigation into this matter is necessary in order to effectively address the issue of food shortage in Brunei for the short and long-term, and more importantly for greater preparedness in the event of national emergencies like such. To this end, the research questions for this study were as follows:

1. What can be learnt from this livestock shortage episode in Brunei?
2. What action should be taken to ensure food security in Brunei?

Considering how the issue is relatively new and still unfolding, this paper relies heavily on grey literature resources that are accessible at present such as government documents and newspaper articles, particularly for the purpose of gathering data specific to Brunei. Around 14 grey literature documents and 10 recent journal articles on the subject matter were reviewed for this paper. This research seeks to contribute to the literature by consolidating the data that is presently available and drawing analyses from it.

3. Review results and Discussion
Food security has been a longstanding challenge for Brunei. The agriculture industry only contributes to 0.54% of the nation’s GDP [7]. The government has been trying to achieve self-sufficiency in terms of food production to feed its population of roughly 400,000. By opening up farmland and offering more support in recent years however, the agriculture sector has started to show promise. For poultry in particular, Brunei’s self-sufficiency in 2018 was an estimated 89.5% which was equivalent to an output of 25.38 thousand tonnes [8]. In 2019, local output was reported to be 24.58 thousand tonnes suggesting an increase of about 1.4% in poultry outputs. The country has also achieved about 47% self-sufficiency in vegetables and 37% in fruits, but still relies heavily on imports of around 30,000 tonnes of rice annually from neighbouring Cambodia, Thailand and Vietnam. Brunei also presently relies on imports for around 70% of its supply of beef. However, Brunei’s self-sufficiency, particularly its livestock sectors, became greatly affected amidst the COVID-19 complications [4]. The following factors have attributed to the recent food shortages:

3.1. Increase in domestic demand for livestock
The COVID-19 situation has added yet another dimension to Brunei’s food security woes. Since March 2020 travel bans were put in place to curb the outbreak of the pandemic, and residents were strongly advised to defer all non-essential travel out of the country [9]. In addition to that, overseas Bruneians were also evacuated from various COVID-19 hotspots [10]. Presumably, the demand for food has increased concurrently with the influx of returning Bruneians and the number of residents hunkering down.
Panic buying was also observed locally in the early days of the pandemic soon after the first few cases of COVID-19 were reported in Brunei. As many stockpiled to prepare for the worst, authorities intervened to assure members of the public that food supplies in particular rice, which was being bought in large quantities were in fact adequate and that panic buying would only lead to disruptions along the supply chain. Nevertheless, since the trajectory of infections has slowed and with a limited number of local transmissions being recorded, the government has since relaxed infection prevention and control measures.

With regards to livestock in particular, retailers started to report that supplies were insufficient to meet consumer demands particularly in the second half of 2020 [10, 11]. The link between the reported food shortages and the time period at which it was observed is the easing of capacity restrictions in public spaces such as food establishments. While previously restricted to serving takeaways only, restaurants, cafes and food courts have since resumed operating at normal capacity following the Ministry of Health’s four phased de-escalation plan [12]. As the nation slowly returned to normalcy, mass gatherings like weddings have also resumed whereby the culture of feasting is a commonplace. In addition to that, long school term breaks over the December period with no chance of outbound travel for families have also contributed to a boost in domestic tourism. Many if not most hotels had recorded higher than usual occupancy rates of more than 90% during the year-end period [13].

3.2. Increasing cost of logistics

Another factor contributing to the shortage of chicken, lamb and other meat products in the country is the increasingly complex logistics of handling imports and exports. As it is widely known, COVID-19 restrictions have caused major disruptions to day-to-day life, from keeping the workforce home to grounding air, land and sea travel. The effects of this are adverse - producers in some countries have had no choice but to dump excess, perishable produce due to reduced movement, meanwhile consumers have also faced reduced access to certain food items [3].

Brunei was particularly affected by this factor considering its heavy reliance on imports of food. In early September 2020, a scarcity of imported meat products was reported – specifically chicken nuggets, frankfurters, meatballs and lamb [4, 11]. This shortage not only had a direct impact on retailers but also on food business operators who were unable to obtain their usual supplies. The government’s stringent regulations on the importation of halal, chilled and frozen meat has further limited the number of alternative accredited suppliers available. Moreover, due to the limited number of trade routes operating, and high volume of cargo to transport, the cost of logistics has significantly increased. This cost is at most times inevitably passed on to consumers.

In Brunei, the price of imported meat products such as beef and lamb have become markedly steep. The price of beef has seen an increase from $15.20/kg in September 2020 to around $16.14/kg in December of the same year. Likewise, the cost of frozen beef has also increased from $12.40/kg to $13.50/kg over 2020 (MPRT, 2020). Other commodities have also seen price hikes. In the last 4 quarter of 2020, it was recorded that the price of red onions gradually went up from $2.34/kg to $6.24/kg. Fresh chilies went from $9.15/kg to around $10/kg, while the price of ginger increased from $3.88/kg to $4.24/kg at present. The government’s Department of Economic Planning and Statistics (DEPS) is said to be closely monitoring market inflation to ensure that businesses do not unethically raise the price of essentials.

3.3. Increasing cost of chicken feed

At the global level, the rise in feed costs will have an increase in nominal poultry prices [14]. Poultry as well as livestock farming rely very heavily on the availability of feed and fodder, mostly made up of maize, wheat and other food grains. It is estimated that one-third of total global cereal production is used in animal feed. Feed accounts for up to 70% of the total cost of livestock operations and can be considered
as the main driver of livestock product [14, 22]. Due to the surge in demand for animal protein and feed, corn prices have increased from US$3 to US$4 to US$5/bushel in a short timeframe in the year 2020 indicating an implication for feed cost inflation [15].

Local poultry farmers have cited high costs of production, in particular the increased cost of chicken feed as a damper to their efforts to meet the heightened demand for chicken locally. Thus, in spite of recording the nation’s highest level of poultry output over the years – 26 thousand tonnes in 2020, supply was still insufficient to meet domestic demand. Consequently, the price of chicken and eggs have seen an increase of up to 6% over 2020 alone. Eggs that usually cost $4.58/tray are now priced at $4.87/tray and fresh whole chickens usually costing $4.28/kg are now on average $4.52/kg [12]. For this reason, the government must urgently put in place plans to enhance their capacity in the livestock sub-sector and implement programs that can help manage potential risks.

3.4. Unstable weather conditions attributed to climate change

The government has additionally pinpointed unstable weather conditions caused by climate change as one of the factors affecting food production [7]. The year 2020 was in fact recorded as the hottest year in history and the rise in average global temperatures over the past 6 years have undoubtedly had adverse impacts on agricultural activities [16]. Global warming can also give rise to other climate-related impacts such as heatwaves, intensified rainfall patterns and flash floods. Such weather events are an imminent threat to farmers and in the bigger picture also a threat to national food security.

Reversing the impacts of climate change may appear to be beyond the control of farmers and agriculture workers, however it remains the responsibility of all who may directly or indirectly become affected by food shortages caused by climate change. In order to address the climate change challenge, governments from all over the world must act collectively to reduce their greenhouse gas emissions and bring down the global temperature [17]. Farmers and other workers within the agriculture sector require the strong support of the government to face the twin challenges presented by COVID-19 and climate change.

4. Proposed coping strategies

4.1. Ease the process of livestock imports

In response to the food shortage experienced in Brunei, one immediate measure that the government has taken is to facilitate businesses with the importation process of live cattle and sheep. The Ministry of Finance and Economy (MoFE) together with the Ministry of Primary Resources and Tourism (MPRT), closely coordinated with PDS Abattoir, the country’s leading cattle abattoir are bringing in an additional number of ready-to-slaughter lamb and live cattle from Australia as part of the national food security initiative [18]. As for beef, to tide over the current high demand, the frequency of commercial imports over land border control posts have also been increased from 3 times per week to 5 times per week [13].

4.2. Plans to increase local supply of poultry

Another way in which the government has intervened in this poultry shortage episode is by working in partnership with 3 of the nation’s main poultry producers to increase the number of chicken coops available and increase capacities to ramp up the supply of chicken to meet domestic demand [8]. Authorities may also consider offering more support to small and medium farm owners who may already possess the technical capacity to operate but lack the resources such as capital or land to expand their operations over a short period of time. This is one alternative way for the country’s poultry sub sector to achieve its self-sufficiency targets and avoid facing shortages in the event of unforeseen supply chain disruptions or spikes in demand which can sometimes occur seasonally.
4.3. Strengthen R&D to enhance the development of agriculture industries

To ensure food security for the longer term, there are a number of areas for action, especially with regards to poultry and livestock production in Brunei.

4.3.1. Train more in animal husbandry

The Monarch have called for the creation of a new agriculture faculty in Universiti Islam Sultan Sharif Ali (UNISSA) where animal husbandry and other agriculture related sciences that are part of Islamic teachings can be taught [19]. This development will greatly benefit the field as it is known that local producers currently rely on private veterinarians and professionals to assist them with husbandry practices [20].

Currently, Crop and Livestock Production as a course is offered at the NTec level (Skill Certificate 3) at the Institute of Brunei Technical Education (IBTE), meanwhile Agrotechnology is taught up to the HNTec level (National Diploma). Students stand to gain more advanced skills and specializations in the field provided that HND (Higher National Diploma) level training is made available to them. By expanding the existing curriculum at IBTE and with the creation of a dedicated faculty for animal husbandry in UNISSA, more professionals can be trained and more resources can go into the research & development of livestock production technologies and thus facilitate the sustainable production of livestock in the country. Research and development and building capacity of researchers and farmers are among the important factors to effectively tackle the challenges of food security in Nigeria and research in universities must be adaptive, problem-solving, issues- and commodity- based and environmentally friendly [21].

4.3.2. Explore ‘smart feeding’

Another area which can be explored is ‘smart feeding’. In order to make the livestock sector more sustainable, biologists and researchers in many different parts of the world are studying alternatives to conventional feed and fodder crops by looking at, for instance insect meals, leaf meals, seaweeds and spineless cactus just to name a few [22]. Considering how conventional chicken feed is not the most easily available form of feed in Brunei coupled with its fluctuating price, it may be worthwhile for local institutions and research centres to study the different alternatives that may be more easily accessible locally or regionally yet still suitable for local poultry and livestock producers. In order to cope with market shocks, modern technologies are increasingly important, for example solid state fermentation enzyme systems, to produce alternative feed source with improved nutritional values without affecting the performance of the poultry [23].

4.3.3. Invest in smart farming

Many countries are now also transitioning to smart farming and using technologies to increase efficiency in their day-to-day operations. One example of a country that has rapidly embraced new farming technologies is Qatar. Prior to the 2017 blockade imposed on Qatar, the country was heavily reliant on imports of food due to the environmental challenges that it faces with traditional farming techniques. The Gulf crisis actually pushed Qatar to restructure its agri-food sector and import routes. Its home-grown technologies have helped to bolster local food supplies and increase food security [24]. Similarly, local authorities and producers must consider the shift towards smart farming to reduce dependency on external factors such as climate change impacts and supply chain breakdowns.

5. Limitations and recommendations

Due to time constraints, this study has not sought out primary data for the purpose of analysis and discussion. However, it is recognised that a study of this nature would benefit greatly from primary data
collection by means of consumer surveys and targeted interviews with local poultry and livestock farmers. Consumer behaviour can be better understood by asking questions concerning their demographics, shopping patterns and rate of household consumption. It would also be useful to seek out farmers’ perspectives on the short- and long-term challenges they are facing in the field and gauge the type of support that they may require to weather through the current situation.

6. Conclusion
Brunei Darussalam has experienced the short-term impact of the COVID-19 on food security. The onset of COVID-19 has presented a new set of challenges for local livestock farmers. The first challenge is to increase outputs to ensure adequate supply for the domestic market; the second challenge is to do so as soon as possible. There have been issues on worldwide labour supply and transportation problem which hinders the supply chain which eventually affects meat production. This episode of food shortage may be the turning point, at the very least for the local livestock industry as authorities and farmers alike are seriously mulling over the issue and seeking an immediate and long-term solution for the problem. It can be observed that the consumption patterns have been affected due to out-of-home consumption which will impact demand for high value meat cuts usually consumed in restaurants. It is recognized that the government has a key role in helping local livestock producers tide over this challenging period of time whereby supply chain disruptions caused by COVID-19 restrictions have complicated day-to-day operations. For the long-term however, it is recommended that the adoption of suitable new technologies and methodologies may better benefit producers and help raise their level of efficiency. This can only be done with the close partnership of policymakers, researchers and scientists. Hence, creating an enabling environment for agricultural innovation should remain a high priority in order to achieve national food security. By successfully raising the level of production of chicken, eggs and other meat over this period of time and beyond, the country will become one step closer to achieving its self-sufficiency targets.

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