

CATTLE TRACEABILITY-A THREAT TO SUSTAINABLE SUPPLY OF BEEF TO EU: A BOTSWANA MEAT COMMISSION

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Abstract: *A trend of bad corporate governance characterised by corruption, mismanagement, non-accountability and unethical practices in state owned corporations is disconcerting. The Botswana Meat Commission (BMC) saga epitomize the trouble not only with the country's public corporation but also with the nation's agricultural sector, in particular the beef industry. The BMC has been in the news for the wrong reasons and it appears that the crisis continues unabated with profound and deleterious impact on the economy, particularly the cattle industry. BMC has been making losses, hit by exports beef quality issues, envisaged privatization and monopoly issues and feedlots problems inter alia. The troubling problem roots from the traceability of cattle slaughtered by the abattoir. Millions of BWP has been spent on the bolus programme to track and trace cattle but it failed to meet its expectations. The BMC lost on numerous occasions its market to the European Union as a result of untraceability of cattle sold to the EU market. Some of the reasons are found to be internal issues of procurement process, inspections by the DVS which is flawed and mismanagement within the institution. This research relied on secondary data collected from 2008 through to 2012. This data is analysed and some key enablers were suggested and a traceability framework is proposed to eliminate and track anomalies in the supply chain.*

Key words: Botswana Meat Commission, traceability, sustainability, beef

INTRODUCTION

Botswana has a livestock population of 3.36 million ruminants (cattle, sheep and goats) out of which 15 per cent falls under a well-developed commercial farming system, comprising cattle ranching and feedlots coexists with a large number (85 per cent) of ruminants under the traditional or communal grazing system (unfenced ranges) comprising small farms. The traditional livestock farming system is subdivided into two: (a) the traditional livestock farming system based on small herds or so-called cattle posts; and (b) the traditional livestock farming system, under the Tribal Grazing Land Policy (TGLP) of 1975 based on relatively large cattle herds being managed under the communal grazing system, but operating on a commercial basis (Gosalamang et al. 2012)

The commercial cattle production system, comprising fenced ranches and feedlots, is highly specialized, employing modern animal husbandry practices and strategic feeding to produce high-value beef animals.

Agriculture remains the critical source of livelihood for most people in Botswana. In 2003/2004, agriculture contributed 2.3% of the GDP, out of which about 70 to 80% was attributable to cattle production (BEDIA, 2007). By 2004, beef exports amounted to 284 Million (Pulas), approximately 1.7% of total exports of 16.2 Billion (Pulas) (Jefferis, 2005). Notwithstanding this contribution, cattle production remains an important factor in the rural

economy as a source of income, employment and investment opportunities. It also has strong linkages with the rest of the economy as a supplier of inputs for meat processing, leather and other industries. Beef is Botswana's only agricultural export to the European Union (EU). The industry benefits greatly from Continuo preferences which give the country significant competitive advantage over other exporters of beef to the EU (Meyn, 2007). According to Meyn (2007), the country is not a globally competitive beef exporter; Botswana is currently only able to supply markets that have both a high protection degree and a high price level. Both criteria apply to the EU market and the EU's recent offer of duty and quota free market access has further contributed to its attractiveness as export destination.

Cattle in Botswana are kept under two production systems, that is, the traditional (communal) and commercial systems. Currently, the traditional system accounts for approximately 80% of the national cattle population, while the commercial system accounts for only 20% (BEDIA, 2007).

According to Jefferis (2007), the government of Botswana discussed the issue of profitability of cattle farming by cattle producers. The government attempted to provide a market-related price assuming that higher prices will contribute to restoring the viability of the beef and cattle sector by stimulating increased production through improved productivity and higher off take, and thereby addressing the low throughput problem.

Available literature also suggests that non-economic factors such as cattle numbers (inventory), rainfall and technology have a great influence on the supply of cattle for slaughter. This research has been necessitated by media reports of alleged corruption practices which led to the collapse of BMC, and an on-going Parliamentary Select Committee (BMC Parliamentary Select Committee, 2012). Beef was one of the foreign exchange earners for Botswana, but since 2008, it affected Botswana economy negatively due to the BMC failure to meet the EU requirements.

MATERIALS AND METHODS

Sources of data

Historical time series data for the period 2007 to 2012 was used in this study. We have attempted to include data for recent years but time series data for the year 2012 were mostly incomplete and unreliable. Therefore, data on domestic producer prices, annual precipitation, chicken output, cattle inventory (population), annual throughput (number of cattle sold yearly), and annual inflation rate as measured by consumer index were obtained from various sources (Botswana Meat Commission, 1994, 2011; Botswana Newspapers; Ministry of Environment, Wildlife and Tourism, 2010; Ministry of Agriculture, 2010; Ministry of Finance and Development Planning, 2010).

In order to address the research question, we performed a content analysis from secondary sources. Information from the websites of the beef industry associations and from sector laws has been recorded. In this way, we identified a list of traceability critical points inside the beef supply chain. Then we applied a very simple classification scheme based on the phase in the supply chain and the traceability framework.

RESEARCH OBJECTIVE

This research aims to explore the operations of BMC and identify factors which led to its collapse and propose a framework to ensure the sustainability of the BMC and beef supply to EU.

HISTORY AND ORGANIZATION

BMC is a parastatal and was established in 1965 to promote the development of the country's livestock industry as well as the country's beef and related products globally. Its headquarters is in Lobatse. The premises are an integrated complex housing an abattoir, cannery and byproducts plant as well as a tannery. Besides owning three abattoirs in Botswana, BMC has cold storage facilities in South Africa with marketing subsidiaries in the United Kingdom, Germany, Holland and South Africa.

LITERATURE REVIEW

Livestock Traceability for Disease Control and Product Safety

Unlike other food industries, the livestock industry has a long history of implementing animal identification and traceability systems to control disease and ensure the safety of meat and dairy products. Lessons from livestock traceability systems may apply to other areas of food safety.

Namibia was an early adopter of such systems in 2004. Botswana maintains one of the world's largest livestock identification systems and had tagged 3 million cattle by 2008. Botswana's livestock identification and trace-back system uses RFID technology to uniquely identify livestock throughout the country. The system enables access to lucrative markets in the European Union, where traceability is a requirement for beef from birth to slaughter. A bolus inserted into the animal's rumen contains a passive RFID (it has no battery or moving parts) microchip with a very hard ceramic coating, which does not interact with stomach enzymes or acids. Fixed readers placed at 300 locations scan the bolus of every animal in the herd to obtain identification numbers, information on new registrations, and the status of disease treatments in the herd. The information is relayed to a central database and on to 46 district offices. Aside from traceability, the tagging system enables weight and feed to be monitored, yield to be managed, breeding history tracked, and animals selected for breeding (Burger, 2003).

Animal identification and traceability systems have numerous applications, such as tracking animal movement, monitoring health, controlling disease, and managing nutrition and yield. RFID tagging systems for livestock contain unique identification data and information on the animal's location, sex, name of breeder, origin of livestock, and dates of movement. Handheld readers are used to register vaccination information and dates; the data are relayed to a central database.

Traceability systems may be implemented to improve the global competitiveness of livestock and meat exports, the quality of meat, and chain of custody traceability. Beef is placed in refrigerated trucks and containers and sealed with a sensor bolt and a tag for identification. Shipments are tracked to ensure that they do not remain in one place for too long. At key points in the supply chain, such as when the beef is unloaded after it has been shipped from the port, the tag is read with a mobile reader to check for evidence of tampering prior to unloading, and tag data are stored in supply chain databases.

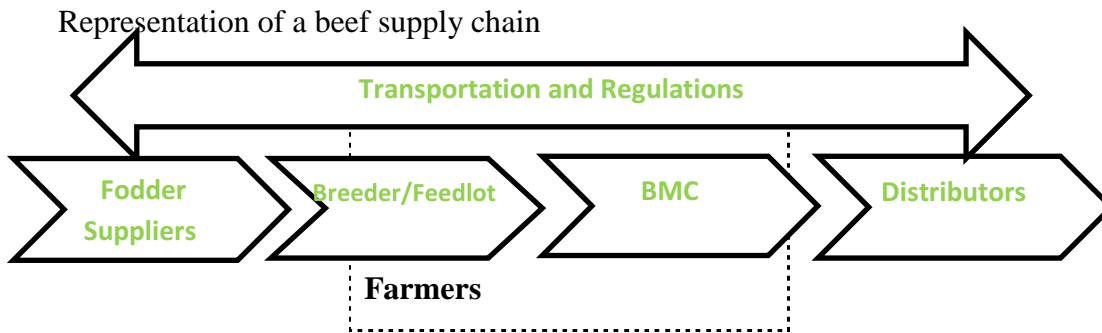


Figure 1: *Sustainability in the beef supply chain: evidences from the Botswana beef industry*

Previous studies in the beef supply chain highlighted the following stages (Francis et al., 2008; Lowe and Gereffi, 2009): fodder suppliers; growers; slaughters; industrial processors; distributors. This supply chain is characterized by a high numbers of breeders, while the other stages are more concentrated. The same applies in the Botswana beef industry which exports to Europe where strict veterinary controls and regulations are followed. In October 2012, a hundred tons of beef exported to Europe was recalled back because of high concentration of antibodies which were traced to feedlots. The Botswana beef supply chain is characterized by producing, on average, high quality meat. That comes with breeding costs that are fairly high, high costs of animal maintenance and import of expensive fodder from neighbouring countries. So Figure 1 above illustrates how the beef supply chain can be affected by unethical and unsustainable practices. The previous studies and the Botswana beef recalling from Europe shows that the antibodies were traced back to the fodder suppliers; the feed was contaminated with growth hormones so that it improves the animal's quality, and this happened with the laws in place.

BMC has exported meat to the EU for 45 years and is committed to maintaining the highest of standards across all its processes. Botswana is struggling to comply with a trade regulation from the EU that calls for it to recording the history of cattle whose beef is meant for the EU market and digitally store the information. The EU push for this was a way of assuring safety of beef products after a breakout of the foot and mouth disease in a report released in December 2010, the office of the Auditor General says two EU regulations –EC_{1760/200} and EC₁₈₂₅ requires the Department of Veterinary Services (DVS) in the Ministry of Agriculture to develop a Livestock Identification System (LITS). This involves digital capturing the history of the beef cattle and its storage as traceable data.

According to the Auditor General's report (2010), the contract hired to maintain the equipment for LITS activities like bolus insertion, cattle movement and change ownership permits did not deliver the quality required service to the government. DVS was the custodian of the LITS project. Thus DVS management was blamed for the LITS project failure to ensure Botswana exports 90% of its beef products to the EU.

The Botswana farmers are reportedly unhappy with the BMC decision to reduce prices indefinitely. This comes after the beef exports to the EU markets from Botswana were suspended for a period of 6 months due to the deficiencies that were found by the EU veterinary inspectors from the European Commission Food and veterinary office. Botswana then self-imposed sales to the EU markets after it received the results in March 2011 which were carried out in January same year. The Botswana Meat Commission temporarily suspended supply while a review and restructure of existing systems was put in place following a recent mission from the EU's Veterinary Service.

In November (2011), the BMC was still hopeful that the DVS will relicense them to supply the EU market. It has been shut from its highest value export market for months following their delisting from the EU market for failure to comply with the requirements that included livestock traceability as per EU requirements, meat hygiene to the highest standard, EU listing of abattoirs among other requirements (Dzimiri, 2011).

Although Botswana Meat Commission has been through a lot of adversities relating to the farmers failing to meet its demand on the thorough put of cattle, the organization held competitions and an education campaign as a way of sensitizing farmers on the importance of adding value to cattle farming and further increase a number of cattle sold. The initiative, themed "Kgomo ke Khumo" (cattle is wealth) was geared at improving the thorough put of the cattle at the abattoir and the feedlots. These campaigns sensitized farmers on the importance of adding value to their products and help them achieve more through increased profits and also help themselves to maintain their farms and ranches better.

BMC has cattle procurement initiatives designed to help farmers recognize the better value of their cattle investment such as the feedlot schemes, 24hr offloading, cattle advance and premium payment schemes. The feedlot scheme is designed to make sure that farmers bring their cattle of not less than 8 months to BMC or any of its contracted feedlots for feeding and supplement. The farmers can also take advantage of the 24 hour load shedding which provides farmers with transport for their cattle to BMC to reduce transport hassles for farmers.

From a livestock procurement point of view, the BMC has had a year with a number of successes with the focus being on correct pricing and service delivery to its producers. The BMC board gave permission to start the development of Direct Cattle Purchase Scheme that involved the setting up of contract feeders and contract growers and will source cattle on a live weight basis. These increases and initiatives put the BMC in a strong position in 2009 to attract the necessary cattle to increase its market share and deliver increased volumes of quality beef to the EU and our other trading areas. BMC has been proactive in regard to Producer Satisfaction and has developed several new services in 2008. The SMS pricing which is sent to farmers by cellphone weekly proves to be a popular tool with all producers and are urged take advantage of the free information service.

Meat supplies from Botswana have been suspended in April 2011 after a visit by EU vets identified issues surrounding the country's traceability systems. The Botswana Meat Commission announced it was temporarily suspending supply while a review and restructure of existing systems was put in place following a mission from the EU's Veterinary Service.

The suspension of Botswana beef exports to the European Union (EU) was lifted for the Botswana Meat Commission (BMC) Lobatse Plant with effect from 27th June, 2012. Botswana had to apply stricter veterinary and quarantine procedures to be able to re-establish its beef exports to the European Union. The Botswana Government, through the Department of Veterinary Services in the Ministry of Agriculture, as the Competent Authority, put sufficient official controls in place to guarantee production of beef destined for the lucrative EU market. The BMC export suspension was due to traceability of its beef which was found with some anomalies.

Traceability systems for bulk goods are also implemented for chain of custody monitoring and quality assurance based on consumer demand. Namibia, which started tracking beef in 2004, was one of the earliest emerging market adopters of advanced technologies to ensure quality and traceability (Collins 2004). A pilot program executed through a public-private partnership with Savi Technology involved the application of RFIDs and sensor bolts to containers of chilled and frozen beef shipped from Namibia to the UK as part of the Smart and Secure Tradelines initiative extended to African ports. In March 2009, Namibia issued new animal identification regulations, which required livestock producers to identify cattle with one visual ear tag and one RFID ear tag. Cattle must be individually registered in the Namibian Livestock Identification and Traceability System. Namibia has also set up a veterinary fence to avoid contamination: Cattle from northern Namibia cannot be exported and must be consumed locally, and cattle from southern Namibia are protected from diseases and exported to Europe. Namibia also sources non-genetically modified (GM) maize from South Africa at a premium to ensure that beef sold in Europe is considered non-GM.

In this web of traceability in Botswana, the fodder supplier would work closely (giving full information of their fodder whether its genetically modified or not) with farmers/breeders and feedlots. A form would be provided to the fodder suppliers by the farmers/breeders or feedlots which records all activities about their products. This form is in turn provided by BMC to farmers/breeders/feedlots where a BMC technician works closely with them in monitoring their activities in compliance. The BMC then will receive livestock which has been monitored by its technicians from what they were fed to the daily recording of their lives which reduces the chances of contaminated livestock brought in for slaughter. The BMC will process the livestock with all farmers and cattle details which can be traced back to fodder suppliers if there are some anomalies detected. Random testing for anomalies should be done during processing and packaging finished products before shipping. The random will test for standard quality, and detect any genetically modified organisms which are not allowed for EU markets. See figure 2 below

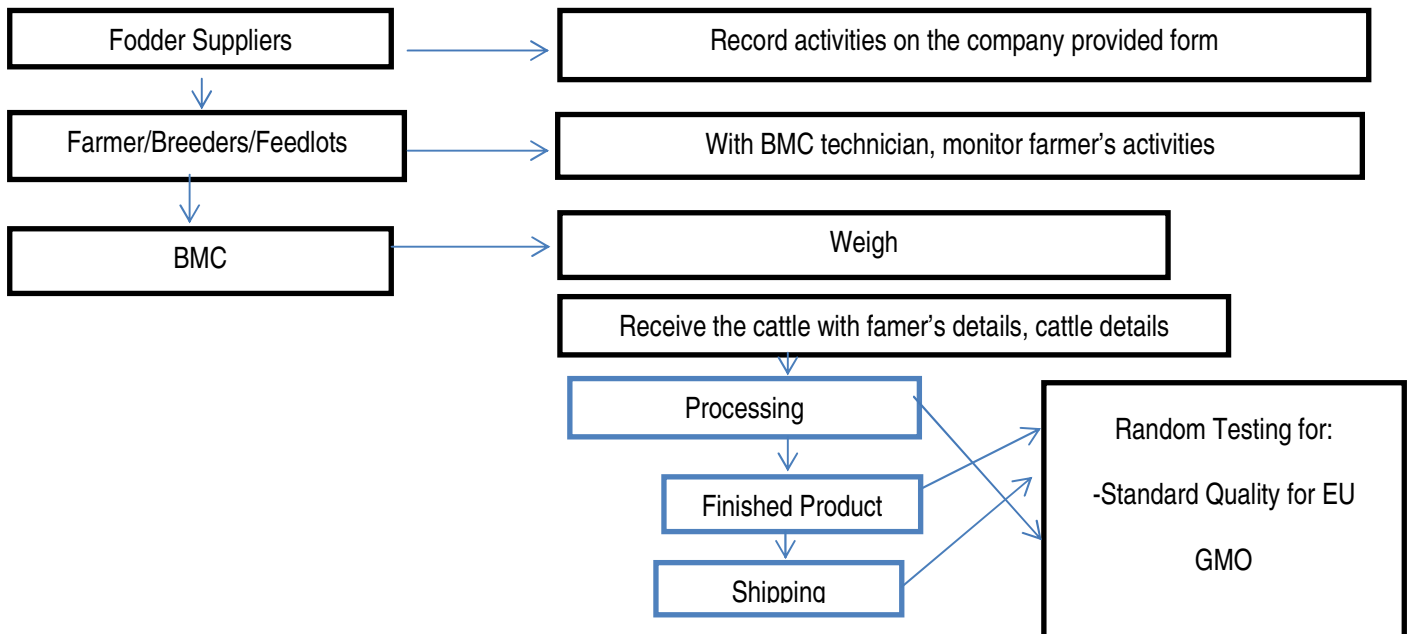


Figure 2. Adapted from Manarungsan, Naewbanij, and Rerngjakrabhet 2005. Proposed Beef Traceability in Botswana beef Industry

CHALLENGES AND ENABLERS

Implementing traceability technologies for food safety and other purposes does not come without its challenges. Broadly speaking, the main challenges lie in data collection, processes, technological solutions, business models, costs, and learning.

Although traceability capacity might have some positive effects on domestic markets in developing countries, by and large traceability systems are unidirectional—they track the chain of custody of food exported from developing countries to developed countries. Developing-country farmers who are unable to meet traceability requirements run the risk of being marginalized. Jaffee and Masakure (2005) found that produce export markets in Kenya relied on the exporters' own farms for products that required traceability; products demanding less traceability came from small-scale out growers.

Studies from the industrial sector, where traceability systems and techniques originated, emphasize that the main difficulties lie in the design of an internal traceability system for a given, complex production process (Moe 1998; Wall 1994). A study on traceability in the United States, undertaken by the International Institute of Food Technologies (IFT), found that challenges are related to both external and internal traceability. External traceability requires accurate recording and storage of information on products and ingredients coming into a facility and information on products leaving a facility. This requirement frequently proves problematic, because industry partners in a food supply chain may not consistently record and store the lot number of the incoming product or case. For internal traceability, data on ingredients and products that may undergo transformation within a facility must be

tracked. . Paperwork is often inconsistent or incomplete, individual products or lots may not be labelled with unique identifiers, and standardized definitions for data elements may be lacking (IFT 2009).

Yet investments in traceability systems offer viable benefits and incentives for actors in the supply chain, including swift and precise recalls of unsafe food; premium pricing for safe, sustainable, and traceable food; cost savings and business process efficiencies; and greater consumer confidence, among others. It is worth exploring some of these incentives in detail, because they offer potential insights for preventing the adoption of systems that exclude smallholders.

Though there is an on-going Parliamentary Commission on the BMC saga, the research has found that there are irregularities in the supply chain. The feed lots are not professionally operated and cattle tracing from the BMC through the supply chain is not existent. The BMC don't have a mechanism to verify whether the feedlots adhere to strict EU regulations. The BMC is not existent on the auditing of its supply chain, they only feature in when cattle are brought in for slaughtering which is very late in the chain, and if there is a problem of failure to comply with EU regulations, it is either detected late or not easy to detect at all because of the volume of carcasses. Lastly but not least, the research found that the BMC and its partners like Department of Veterinary Services employees (DVS) lacks motivation and there is an element of politicising the BMC rather than professionally run by qualified personnel.

CONCLUSION

In conclusion, it is advisable that the BMC and all its stakeholders identify each other's role in the supply of livestock for EU market. Again all stakeholders need be educated in the EU standards of quality and expectation. Livestock traceability will fail if it is seen as the role of the BMC alone, the whole supply chain should play a role and do their own quality checks at different point in the system. But BMC as the one in the phase of the public need make sure that it instigates a transparent process of livestock supply chain. This can be done by quality controls exercised by BMC in having its technicians working with farmers and feed lots to produce quality livestock which had more returns for the farmer and BMC. The proposed traceability framework can be a panacea to BMC's everlasting chaos.

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