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## Challenges in commercial pig production in Botswana

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The major challenges facing commercial pig production in Botswana was discussed in this paper. Pig production in Botswana has not grown over time due a myriad of challenges. In Botswana, commercial pig production can be categorized into small-scale, medium-scale commercial and large-scale, with small-scale commercial being predominant. The semi-intensive system of production predominates. Local pork production is estimated to be 29.1% and imports 61.8%. Low production value shows that the contribution of the industry to the world pig population is insignificant. Pig farming faces many challenges including high feed costs, inadequate slaughter facilities, unorganized marketing, poor breeding stock, transboundary diseases and inadequate extension service. It, however, appears inadequate slaughter facilities and high feed costs are the top two major challenges. For production to be raised, these challenges need to be addressed collectively by stakeholders through collaborative efforts.

**Key words:** Botswana, challenges, imports, per *capita* consumption, pig farming, production

### Introduction

In Botswana, commercial pig production started in the early 1970s but has not grown significantly over time. Lekule and Kyvguard (2003) stated that experiences from Africa show that intensive pig farming is stagnant and the sustainability of the traditional sector is better than that of the intensive sector. According to Galeboe *et al.* (2009), Botswana's market share of pork is about 0.06% of Africa's output and 0.0005% of the world's output, indicating that it is insignificant. The predominant system of rearing pigs is semi-intensive system. Commercial pig production in Botswana is practiced mainly as semi-intensive production system. Pig enterprises in Botswana can be broadly categorized into small-scale, medium-scale and large-scale commercial. Small-scale commercial enterprises are predominant in the country. In China, Donald

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and Shen (2006) reported that 70% of pig production enterprises are small-scale and that these produce 74% of the country's pork requirements.

In an endeavour to promote pig production in the country, Botswana government in 1975 set up Sebele pig breeder facility in order to supply breeding stock and weaners to farmers at subsidized prices. However, the supply of pigs from Sebele breeder facility is insufficient. In addition, government provides fully sponsored training to farmers on basic pig husbandry through Ministry of Agriculture extension service. Despite these efforts, the development of pig sector in the country has been slow compared to other livestock sectors such as poultry industry which is self-sufficient (Moreki, 2011).

According to Chabo *et al.* (2000), commercial pig production enterprises are distributed in cities and major villages where there is lucrative pork market and adequate infrastructure (Chabo *et al.*, 2010). The authors reported that pork consumption is limited to people living in towns and peri-urban areas whose lifestyles are of medium to high class. Moreki and Mphinyane (2011) estimated local pork production to be 29.1% and imports 61.8%, indicating that there is a need to raise production level. The *per capita* consumption of pig meat per person per year is estimated to be approximately 1 kg (Mphinyane, 2011).

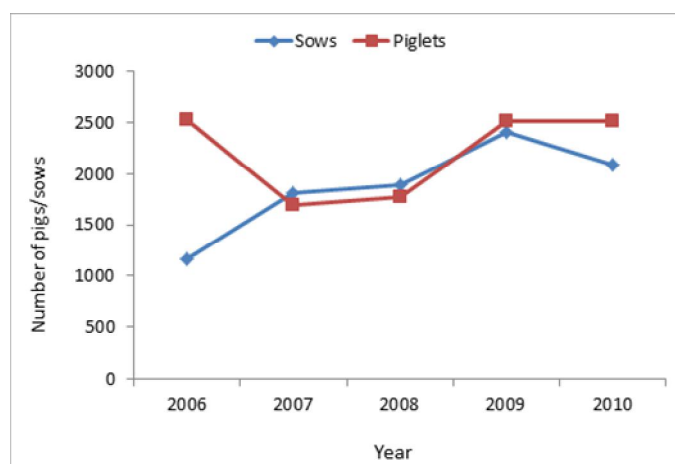
Local Enterprise Authority (LEA) (2009) identified pig production as one of the breakthrough areas in Botswana. As a result, government provides support to the pig industry through Citizen Entrepreneurship Development Agency (CEDA), Department of Culture and Youth and LEA. CEDA finances youth enterprises at subsidized interest rates under Young Farmers Fund programme and provides mentoring and coaching services. Similarly, Department of Culture and Youth provides financial assistance and training to youths. Furthermore, LEA provides subsidized training, mentoring and coaching services to pig farmers in order to equip producers with knowledge and skills.

Currently, the pig industry in Botswana is experiencing stagnant growth due to a number of challenges. Therefore, literature was surveyed to investigate these challenges that impede the industry's growth.

### ***Population trends of sows and piglets***

The number of sows and piglets born alive over a period of five years is given in Figure 1. According to Figure 1, the population of piglets increased from 2006 to 2009 and thereafter declined. On the contrary, sow population decreased from 2006 to 2007 and thereafter increased. Figure 1 shows that from 2009 to 2010 the population of sows declined while that of piglets increased. The decline in sow population from 2009 to 2010 could be attributable to

closure of some slaughter facilities because of the enforcement of the implementation of the Livestock Meat Industries Act by the Department of Veterinary Services (DVS).



**Fig. 1.** Number of sows and piglets from 2006 to 2010

Source: Animal Production (2006) and Mphinyane (2010)

It is clear from Figure 1 that the population of piglets declined from 2006 to 2008. This indicates that a significant proportion of sows do not farrow during the year probably due to insufficient monitoring during production periods (lactation, weaning to service and gestation periods). In addition, sows could be kept longer in the breeding herd without being culled due to insufficient breeding stock.

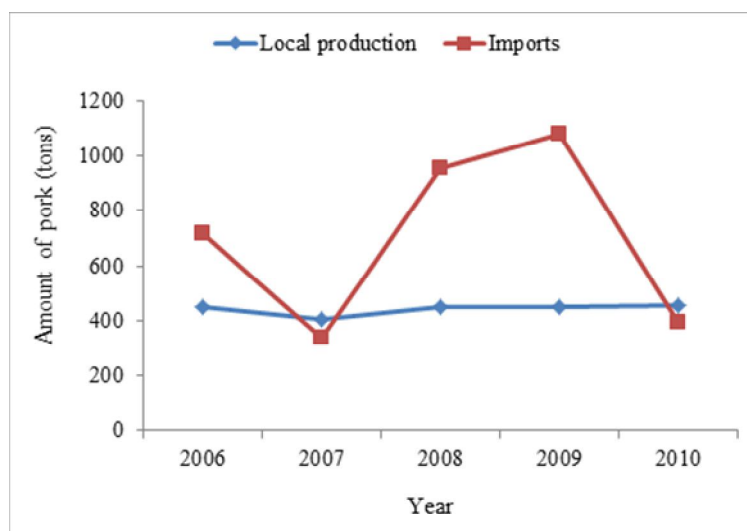
Litter size and index in East and Southern Africa is nine and two, respectively. In agreement with Lekule and Laswai (2007) litter index in Botswana is estimated to be two. This low index value adversely affects the number of piglets born per sow per year. According to Chabo *et al.* 2000 and Lekule and Laswai (2007), in southern Africa 18 piglets are born alive per sow per year. In Botswana, the number of farrowing per sow per year is two and the number of piglets born alive is 10.

### ***Production vs. imports***

As shown in Figure 2, pork production remained constant from 2006 to 2010 while imports generally increased over time. However, imports declined from 2006 to 2007 and 2009 to 2010. The decline in imports from 2006 to 2007 is ascribable to the outbreaks of Foot and Mouth Disease (FMD) in April 2006

in Selebi Phikwe (National Veterinary Laboratory, 2007) and classical swine fever in the Republic of South Africa (RSA) in 2005 (Mphinyane, 2007). A sharp decline in imports observed from 2009 to 2010 is due to inadequate slaughter facilities and improper handling of data with some import data not unrecorded (Mphinyane, 2010). Furthermore, the outbreak of FMD in Gantsi in October 2008 resulted in movement restrictions of livestock including pigs and pig meat products leading to a decline in imports.

It is evident from Figure 2 that a large proportion of pig meat consumed in the country is imported. This finding is consistent with Moreki and Mphinyane (2011). Factors such as inadequate slaughter facilities (Moreki and Mphinyane, 2011) and consumers' preference of pork byproducts than fresh pork (Galeboe *et al.*, 2011) are some of the contributory factors to high imports.



**Fig. 2.** Local production vs. pork products imports from 2005 to 2010

Source: Animal Production (2006) and Mphinyane (2010)

### ***Main challenges in commercial pig production***

Several challenges facing the commercial pig operations in Botswana include high feed prices, inadequate slaughtering facilities, unorganized marketing, poor breeding stock, transboundary diseases and inadequate extension service.

### ***High feed prices***

Botswana is not self-sufficient in grain production resulting in feed manufacturing companies being highly dependent on imported raw materials. According to Chabo *et al.* (2000), feed costs account for approximately 88% of the cost of production. The study of Galeboe *et al.* (2009) showed that 84% of the respondents cited high feed costs to be a major constraint in pig production followed by lack of working capital to run the enterprise efficiently (49%), high fuel costs (24%), lack of local feed suppliers (24%) and shortage of skilled labour (24%). Because of high feed costs, pig producers are forced to use alternative feeds such as bran and brewers spent grains or to mix complete diets with bran (especially sorghum bran) as a way of reducing feeding costs. This practice results in poor growth rates and subsequently lower economic returns.

### ***Inadequate slaughter facilities***

Pig producers in Botswana rely on municipal abattoirs to slaughter pigs. These abattoirs are located in Francistown, Selebi Phikwe, Gaborone and Lobatse. However, Gaborone and Francistown abattoirs are currently closed because they could not meet the requirements of the Livestock Meat Industries Act, which requires that pigs must be slaughtered in licensed premises and be subjected to *ante mortem* and *post mortem* inspections. The Act also stipulates that carcasses should be accompanied by health certificate which bears a health mark. Because of the closure of Gaborone municipal abattoir, producers in the southern part of the country slaughter their pigs in a private abattoir which charges high slaughter fees (Moreki, 2009). Similarly, producers from Mahalapye, Serowe and Palapye slaughter their pigs in Selebi Phikwe (Mphinyane, 2011), about 130 to 200 km away. The slaughter of pigs in Selebi Phikwe contributes to farmers incurring high transportation costs, thus rendering pig farming unprofitable. Furthermore, the absence of municipal abattoirs in some villages where pigs are produced has resulted in small-scale producers slaughtering pigs on farms under unhygienic conditions. It seems that inadequacy of slaughter facilities is a major contributory factor to low offtake in Botswana.

### ***Unorganized marketing***

Unorganized marketing is one of the major factors impeding the development of the pig industry in Botswana (Moreki and Mphinyane, 2011). The common marketing channels in Botswana are farm–abattoir–butchery or processing plant (wholesale) with finished products distributed to supermarkets.

Farm–farm and individual sales are other types of marketing channels. It seems that the main marketing channel in Botswana is farm–abattoir–wholesale (Galeboe *et al.*, 2009). Although Montsho (2010) reported that poor quality pork and inconsistent supply are marketing challenges in the northern part of Botswana, Galeboe *et al.* (2009) found that buyers were satisfied with the quality of pork from local farmers.

In Botswana, the pig industry is not linked to supporting structures; hence the entire marketing chain from farm to retail is not viewed as single profit making entity. Martin (2011) in the Philippines reported that the majority of commercial operations are not integrated into the processing industries, and that producers negotiate prices according to the market demand.

### ***Breeding stock of inferior quality***

There is no defined breeding programme at the Sebele breeding facility which was established to supply breeding pigs to farmers. Again, replacement stock has no breeding records, which makes it difficult to design a breeding programme at the breeding facility and farmer level. Additionally, lack of breeding companies in the country is a limitation to improving pig herds. In the Philippines, Lapus (2009) reported that international pig breeding companies have established nucleus farms or joint ventures with local farms with some large farms importing pure breeds either as live animals or semen to upgrade their breeding stocks.

Pigs in Botswana originate from one source and as such inbreeding is common; hence poor quality of stock. Inbreeding causes a loss in heterozygosity and increases homozygosity which results in increased lethal genes that increase embryonic death, mummified fetuses and stillbirths. Furthermore, inbreeding causes a decrease in production/reproductive performance and fitness (inbreeding depression), low birth weights, increased mortality and poor fertility (Nicholas, 2003).

### ***High piglet mortality***

In Botswana, pre-weaning mortalities are high and are associated with crushing and chilling, indicating inadequate husbandry management practices. This is because the majority of pig farms in the country are not equipped with farrowing pens and heating systems due to lack of access to capital. Farrowing crates and heating systems are mainly found in medium and large-scale operations. Additionally, pig pens on most farms are poorly designed giving rise to crushing and draughtiness. Chabo *et al.* (2000) reported mortality rate of 35% at Botswana College of Agriculture farm, which they attributed to

crushing. In addition, chilling accounted for 10-19% of the piglet mortality. Other causes of mortality were starvation, agalactiae and stress (Production Industry and Field Services Sector, 1992). Recently, Moreki *et al.* (2011) reported that septicaemia, colisepticaemia, stress and starvation can also result in pre-weaning mortality.

### ***Unserviced land***

In most parts of the country, land allocated for livestock production is not serviced, i.e., it does not have water or electricity. Also, land allocated for pig production is outside water works area or far away from the electricity grid. The supply of water and electricity to areas that are not serviced is very expensive. The study of Galeboe *et al.* (2009) found that water and electricity bills in Botswana are expensive. In addition, there are no access roads to projects resulting in products taking long to reach market outlets often leading to deterioration of products.

### ***Weak linkages among major stakeholders***

There is no collaborative effort among the main stakeholders such as LEA, CEDA, MoA and Depart of Culture and Youth (Galeboe *et al.*, 2009) who provide training, mentoring and coaching services to pig producers. The authors suggested that the stakeholders need to collaborate to administer a national programme aimed at enabling pig farming to take advantage of the vast existing market opportunity and growing it to achieve the diversification of both the agriculture sector and national economy.

### ***Inadequate extension service***

Extension areas in Botswana are vast resulting in extension coverage being minimal. Also, service delivery is insufficient due to inadequacy of transport and personnel (Moreki, 2009). In addition, extension personnel are not adequately equipped to provide quality service to pig farmers as they have not received specialized training in pig production (Galeboe *et al.*, 2009; Moreki and Mphinyane, 2011). Madukwe (2006) reported that failure of various extension delivery approaches in developing countries to effectively engineer a significant sustainable agricultural growth is due to market liberalization and globalization that gives rise to initiatives that enhance efficiency and effectiveness of not only the sub-components of extension delivery but the entire system of technology generation, dissemination and use.

### ***Transboundary diseases***

According to Otte *et al.* (2004), transboundary diseases threaten food security, affect livelihoods of rural communities and disrupt local and international trade. The outbreak of transboundary diseases threaten the pig industry and cause huge economic losses to both producers and the economy. The major threatening diseases are classical swine fever, FMD and African swine fever. The outbreaks of FMD in Matsiloje in 2002 and 2011 and Sebebi Phikwe in 2007 contributed to the decline of the pig industry. These outbreaks resulted in movement restrictions being imposed on pigs, products and feed leading to decreased production and consumption.

Other challenges in commercial pig production are lack of research to support the industry and lack of access to capital (Galeboe *et al.*, 2009).

### **Recommendations**

There is need for MOA, LEA, CEDA and Department of Culture and Youth to collaborate since they offer the same services to pig producers.

Extensive research should be conducted to develop programmes that are consistent with production systems practiced in the country.

The abattoir component of Livestock Management and Infrastructure Development (LIMID) programme should be extended to pig farmers.

In order to make pigs available to farmers, government should consider building a pig breeding facility in Francistown and/or expand the facility at Sebele. In addition, the private sector should be encouraged to invest in breeding operations.

Ministry of Agriculture should design a breeding programme that is consistent with the production system and market needs accompanied by extensive recording system at the Sebele breeding facility.

Vertical integration as a strategy to offset challenges in the marketing chain of pork products should be encouraged.

Pig extension agents should be trained in general pig husbandry to enable them to impart knowledge and skills to farmers.

### **Conclusion**

The pig industry has remained stagnant over the years as shown by high imports which are greater than production.

The major challenges faced by the pig industry in Botswana including *inter alia* high feed prices, inadequate slaughtering facilities and transboundary diseases.



There is no collaborative effort among the major stakeholders that are involved in the development of the pig industry.

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