Louw Pienaar
Macro & Resource Economics
Email: louwpp@elsenburg.com
tel: +27 21 808 5023

Economic Impact Assessment of Highly Pathogenic Avian Influenza (HPAI) on the Agricultural Sector in South Africa

Louw Pienaar

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1. Introduction

The Western Cape Province of South Africa has in recent years been significantly impacted by unforeseen natural and biological disasters. The current drought is a case in point, impacting on large areas of farming in the Province and significantly altering the sector's production capabilities (BFAP, 2016). On the 26th of June 2017 an outbreak of Highly Pathogenic Avian Influenza (HPAI, or Avian Flu) occurred in the Mpumalanga Province near Villiers. The National Department of Agriculture, Forestry and Fisheries (DAFF) has confirmed the detection of Avian Flu after tested samples from the farm yielded positive results for the H5N8-strand of the virus (DAFF, 2017).

Avian Flu is a controlled disease in terms of the Animal Diseases Act, 35 of 1984 and the agricultural industry is currently on high alert for any possible spread of the virus. This sudden outbreak has been accompanied by decision makers wanting to know the possible economic impact of another such biological disaster on the agricultural economy. Indeed, since this recent detection of Avian Flu, neighbouring countries such as Namibia, Botswana, Zimbabwe, Mozambique and Zambia has all announced that they are suspending poultry imports from South Africa with immediate effect (Businessday, 2017). According the National Minister of Agriculture, Senzeni Zokwana, about 270 000 birds have been culled in the affected area and various measures have been introduced to stop the spread of the virus. Throughout the past decade various strands of the virus has been reported and isolated without major economic impact, whilst the outbreak of 2011 in the Uniondale and Oudtshoorn area has had far-reaching impacts on the agricultural economy (Venter et al., 2013).

This short report will seek to provide an initial impact assessment of an Avian Flu outbreak on the South African agricultural economy. To do this, existing reports following the 2011 outbreak will be used and some analysis on trade and employment trends will give some indication of the impact of another outbreak. Detailed data on both the ostrich and poultry sector remains a limiting factor, but a scenario will be developed to estimate the economic impact.

2. Background

Avian influenza was first reported in its highly pathogenic form (HPAI) on a small farm in Scotland in 1959. Since then several epidemics have occurred in various part of the world, including developed countries in Europe and North America (Otte et al., 2008). Estimates

of the global costs associated with HPAI outbreaks since 2003 runs in the billions of U.S Dollars. Avian Flu is an influenza type A virus that appears in many different sub-types classified according to its two main components—Haemagglutinin (H) and Neuraminidase (N). The spread of the disease has raised grave concerns for both animals and human health and there has been a steady increase in the number of outbreaks in the past decade compared to the past 40 years (FAO, 2017).

The impact of a single outbreak of HPAI on a country's aggregate economy depend on the speed at which it can be controlled, the extent of the spread, the contribution of the poultry/ostrich industry to GDP and the structure of the industry (McLeod et al., 2005). Many studies on the socioeconomic impact of Avian Influenza limit their analysis to production impacts with little coverage of spillover impacts on health, prices, trade and markets and very importantly, consumer confidence in poultry products. This is mainly as a result of limitations on data availability and the difficulty in measuring wide spillover effects in general (Obayelu, 2007). The next two sections will attempt to determine the economic impact of an Avian Influenza outbreak by reviewing two exiting reports, after which specific focus will be given to estimate the impact of the 2011 outbreak on production, trade and employment in order to support sound decision making going forward.

3. Review of Avian Flu's impact on Agriculture

According to the WHO (2005) influenza pandemics are rare, but recurring events. In the South African context it is specifically the poultry and ostrich industries that will be adversely affected by another outbreak. These industries can hardly afford another set-back, with the poultry industry already on its knees with continued struggles against cheap meat imports from the US and Europe, and the continual higher-than-usual feed prices that is constraining competitiveness in the global market for South African producers. However, the South African Poultry Association's (SAPA) Kevin Lovell believes that another Avian Flu outbreak will not affect the poultry industry significantly in the longer term mainly due to the fact that the country only exports around 3.7% of all of its poultry. However, in the case where the disease spreads it could still have a major impact on the availability of poultry products and it's pricing in the local market (Businessday, 2017).

In April 2011 Avian Influenza of the strand H5N2-virus was identified on a farm in the Klein-Karoo area. A ban on all ostrich exports to the EU was triggered as the virus quickly spread to 26 other farms in the region within a month (Durr, 2011). Some of the immediate impacts following the outbreak was a monthly loss of R108 million from foreign export earnings,

whilst the ostrich industry was forced to slaughter compulsory (cull) approximately 27 000 birds of which some 3 000 were breeding birds. In current values, the total replacement cost of these birds was valued at R72.62 million at the time (Durr, 2011).

In trying to estimate the impact of the Avian Influenza on employment, Pienaar & Partridge (2013) showed a declining, and volatile employment trend for agricultural workers in the Eden District. Detailed breakdown of employment by sub-sector is not currently available in South Africa and it is impossible to know how many jobs have been lost as a result of the virus. However, with more than half of all ostrich farms registered for exports of products the impact would be substantial. According to Durr (2011) the South African Ostrich Business Chamber has indicated that in the months after the market closures for ostrich meat, the industry had to lay off around 805 abattoir workers, whilst many more on-farm were lost with the majority farms registered for meat exports (296 of 536). According to Mugido (2011) the Oudtshoorn agricultural sector provides 21% of all direct employment, while it also contributes to downstream job opportunities. The socio-economic impact of employment in agricultural industries such as the ostrich industry is often underestimated due the impact it has on housing, food and improved livelihoods of rural people (Brand & Jordaan, 2011).

It was officially announced that the four-year ban on all ostrich exports were lifted by the European Union in 2015 after much efforts from government and industry (WCDoA, 2015). Ostrich exports have only in the past year reached the same levels as pre-2011 and it is now possible to measure the impact of the outbreak from 2011-2016. This will be done in the next section looking at the impact of the virus on production, exports and employment.

4. Economic Impacts of Avian Flu

Production

As already mentioned, it is not expected that the poultry industry will be significantly impacted by another Avian Flu outbreak and this is evident by looking at the Gross Value of Production (GVP) in Figure 1. The monetary value of poultry production (red) has not seen any significant changes in the value of production between 2011 and 2016. The same cannot be said of the ostrich industry (blue). Ostrich production has been severely impacted since 2011 with a significant drop in value indicated in the grey area. The South African ostrich industry is the biggest supplier of ostrich products in the world both in terms of production and value-added (Brand & Jordaan, 2011; DEDAT, 2012). If one assumes

that the 2016 level of production is the equilibrium output without any outbreak of Avian Flu and a linear line from the 2010 level of output is drawn, then this becomes the benchmark production. Actual production values lower than this trend-line is considered losses as a result of the virus. Adding up these losses, the total decline in production can be valued at R864.3 million from 2010 to 2016. This value does not include additional losses in revenue and costs associated with the culling of herds. This estimate is also very conservative seeing that meat prices have increased considerably in recent years. Thus, since the ban on ostrich meat exports, the total value of production has dropped from R513 million to R276 million between 2010 and 2012, essentially wiping out more than 42% of the entire industry (DAFF, 2016). Since then the industry has slowly started to grow its output and only reaching R530 million in 2016.

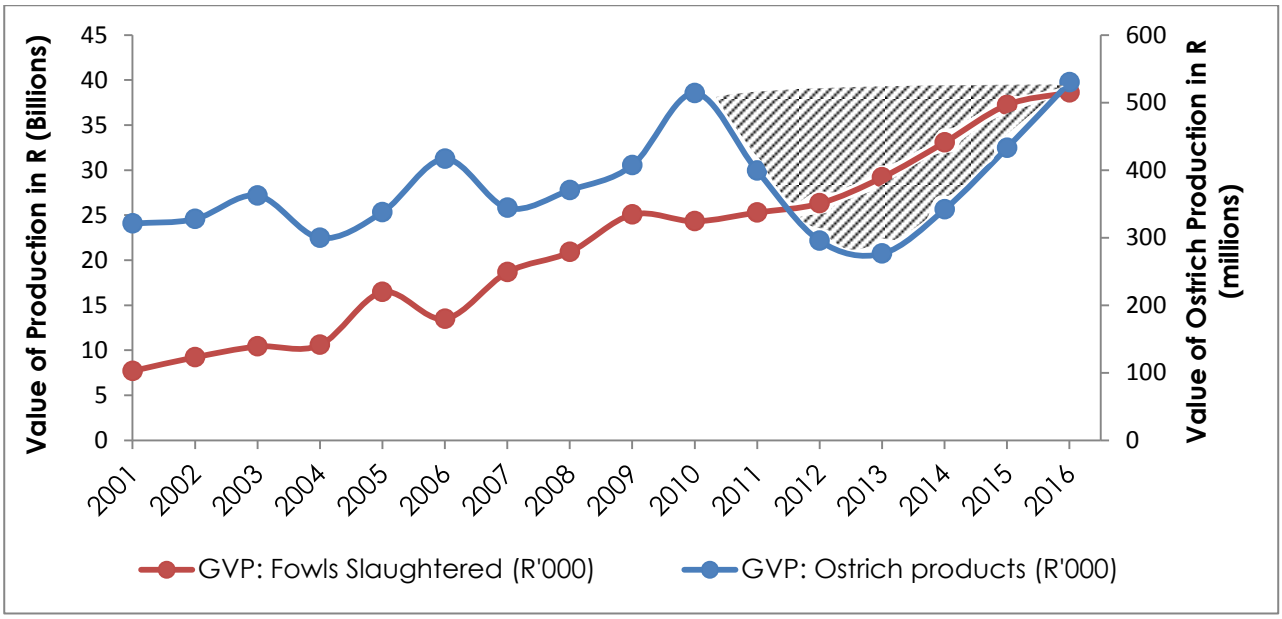

Figure 1: The Gross Value of Production of Poultry meat and Ostrich products in South Africa, 2001 - 2016

Source: DAFF, 2016

The Ostrich industry is much more dependent on the exports of products and is therefore set to be impacted more significantly than their chicken industry counterparts with another outbreak. Such impacts are further pronounced by the geographic concentration of production in the Western Cape, and in particular the Eden District where of the majority (77%) of all South Africa's ostriches and its associated products are produced (Durr, 2011). This industry is therefore makes a significant contribution to economy in this region and creates ample jobs in the Eden District with many livelihoods dependant on it.

Exports

As expected, the ostrich meat exports were severely affected by the virus and the losses in foreign revenue is indicated in the grey area in Figure 1. Again, only in the past season has the industry managed to export meat at levels higher than the 2010/11 production season. Thus, if one assumes that the linear trend would have been realised without any Influenza outbreak, the total losses in export earnings is estimated at R1.12 billion from 2011 to 2016. This value is higher than the losses in production value seeing that much of the produce were moved into the local market at lower prices. Other spill-over impacts that are difficult to measure is the additional investments made to get access to markets for ostrich meat over the years. Furthermore, the global market for these types of meat imports (HS: 020890) have steadily grown from R3.5 billion in 2006 to 9.2 billion in 2016; an annual increase of 9.89% throughout this period (ITC, 2017). More years of market closures as a result of an Avian Flu outbreak will again shock the sector and market opportunities will again be missed that could lead to more growth in jobs.

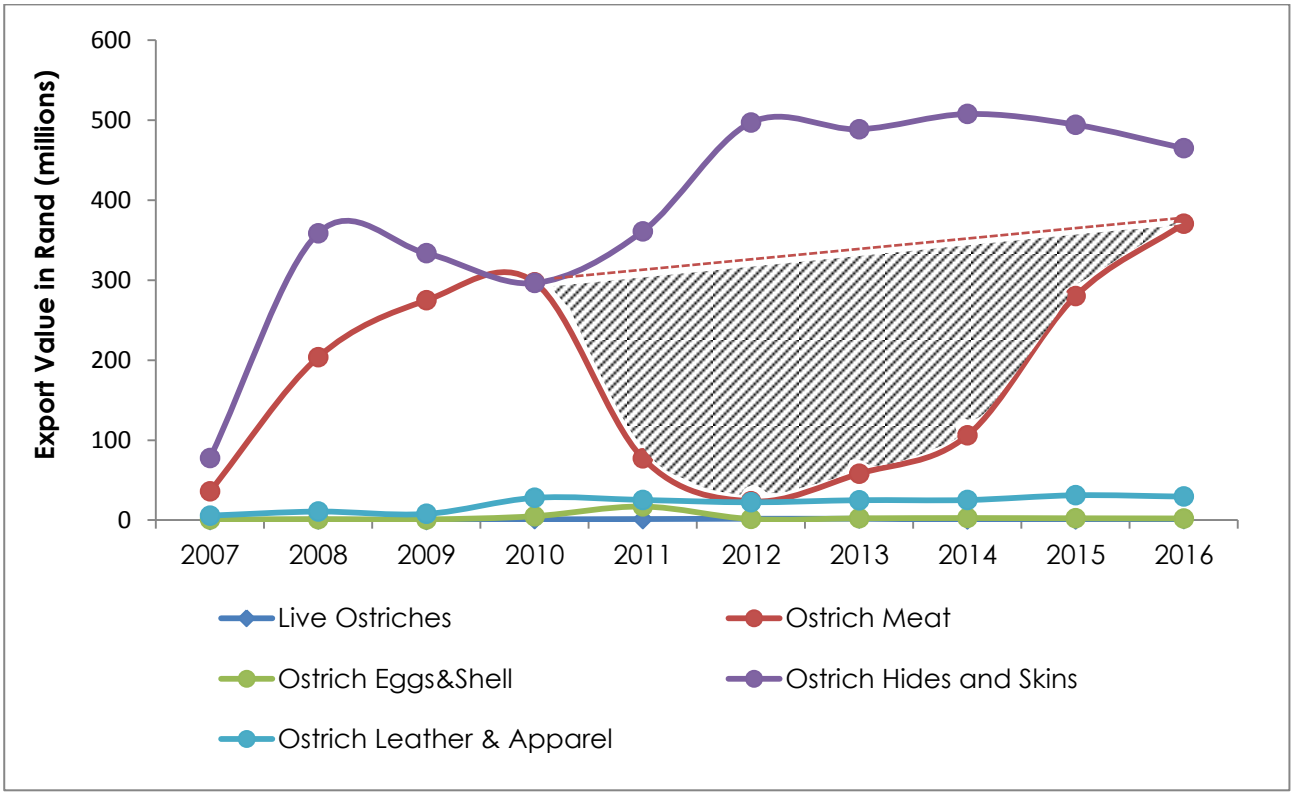

Figure 1: Value of South African ostrich exports to the world from 2007 – 2016

Source: ITC, 2017

Employment

As mentioned earlier, it is very difficult to assess the impact of an HPAI-outbreak on jobs for a specific sector. One of the only available methods is to use industry information and the employment multiplier technique to estimate the employment impact. This will be done by firstly using a production/labour multiplier recently developed by GreenCape (2015) which includes a multiplier for ostrich and game farming. Following the same logic as in Figure 1 and 2 it is assumed that a result of the decline in production, ostrich farms, abattoirs and related businesses were forced to shed jobs. These results are given in Table 1 below and it's clear that these numbers are close to the ones given by the Durr (2011). In total, the estimated job losses were approximately 3881 jobs during the period of lowered production and the majority of these (60%) were unskilled workers. This total calculates the amount of full-time jobs that were lost in each year's lowered output. This again is probably a conservative estimate as the ostrich industry employs around 20 000 (direct and indirect) workers and every one of the meat-exporting farms employ about 10 workers (2960 workers). Additionally, there are around 1100 abattoir workers and many more workers in downstream sectors that will be affected by another Avian Flu (Durr, 2011).

Table 1: Employment numbers and estimated job losses in the ostrich industry from 2011-2016

Scenario: Number of jobs lost with less production				
Decline in GVP: 2011-2016	R864.3 million			
Type of jobs	Skilled	Semi-Skilled	Unskilled	Total
Number of Job losses	415	1115	2360	3881
2011				516
2012				981
2013				1067
2014				773
2015				364

Source: Own calculation using GreenCape (2015) & DAFF (2016)

5. Conclusion

This short economic impact assessment has analysed the possible impact of another Avian Influenza on the Western Cape agricultural economy. From the initial review is has become clear that the chicken industry will not be significantly impacted by another

outbreak, but the ostrich industry are not so fortunate, being heavily reliant on the exports of ostrich meat for their sustainability. Previous studies on the matter were reviewed and with the luxury of hindsight, the data was analysed to get a sense of the economic impact of the previous outbreak of Avian Flu in 2011.

Focusing mainly on the economic indicators such as production, exports and employment, the analysis has used a simple and conservative scenario. The scenario measures the economic losses as a result of the Avian Flu outbreak assuming that production would have seen a linear trend to towards the current levels of 2016. The results suggest that ostrich production has fallen by at least R864.3 million as a direct result of the disease and the impact on export revenue was in excess of R1.1 billion as many farmers missed more lucrative export opportunities in global markets, especially in Europe. Finally, looking at employment, it was estimated that the impact of the Avian Flu has resulted in approximately 3 881 jobs being lost over the period from 2011-2016.

From the analysis it is clear that producers, industry stakeholders and government Departments must do all it can to prevent the spread of HPAI from the existing occurrence in the Mpumalanga province. The ostrich industry is at high risk and the economic impact of another outbreak will certainly test the resolve of an industry that has just about recovered from the 2011-virus.

Bibliography

Brand, T. & Jordaan, J., 2011. *The contribution of the South African ostrich industry to the national economy*. Elsenburg: SASAS Western Cape Department of Agriculture.

Businessday, 2017. *Poultry sale in SA 'not affected by outbreak'*. Cape Town: Bekezela Phakath Business Day Newspaper.

DAFF, 2016. *Abstract of Agricultural Statistics*. Pretoria: Directorate Statistics and Economic Analysis Department of Agriculture, Forestry and Fisheries.

DAFF, 2017. *Media Statement: Avian influenza confirmed in Mpumalanga*. Pretoria: National Department of Agriculture, Forestry and Fisheries.

Durr, D., 2011. *The economic impact of Avian Influenza (H5N2) on the ostrich industry in the Western Cape*. Elsenburg: Directorate: Agricultural Economics Services Western Cape Department of Agriculture.

FAO, 2017. *Avian Influenza: Background*. [Online] Available at: http://www.fao.org/avianflu/en/background.html [Accessed 03 July 2017].

GreenCape, 2015. *Greencape Sectoral Multipliers*. Pretoria: Conningarth Economists.

McLeod, A., Morgan, N.P.A. & Hinrichs, J., 2005. *Economic and social impacts of avian influenza*. Rome: FAO.

Mugido, W., 2011. *A financial cost-benefit analysis of the implementation of a small-camp system in ostrich farming to allow veld restoration*. Masters' thesis. Stellenbosch : Stellenbosch University Department of Agricultural Economics.

Obayelu, A., 2007. Socio-economic analysis of the impacts of avian influenza epidemic on households poultry consumption and poultry industry in Nigeria: empirical investigation of Kwara State. *Livestock Research for Rural Development*, 19(4).

Otte, J. et al., 2008. *Impacts of avian influenza virus on animal production in developing countries*. Rome: FAO.

Pienaar, L. & Partridge, A., 2013. *Report on the impact of the avian influenza on employment in Oudthoorn*. Elsenburg: Agricultural Economics Services WCDoA.

Venter, M. et al., 2013. Avian influenza at the animal-human interphase in South Africa. *Communicable Diseases Surveilance Bulletin*, 11(2), pp.51-54.

WCDoA, 2015. *Elsenburg*. [Online] Available at: http://www.elsenburg.com/news/european-union-lifts-ban-south-african-ostrich-exports [Accessed 07 May 2017].