

# Economic impact of the 2017 outbreak of HPAI in South Africa

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The 2017 outbreak of highly pathogenic avian influenza (HPAI) in South Africa had a notable effect on the poultry industry – one of South Africa’s largest agricultural subsectors. To facilitate rigorous response strategies, quantification of the disease’s impact is critical.

South Africa’s strategy, to date, was to contain the disease by culling affected birds. While a possible vaccination strategy is being considered, such a strategy has not been formalised. In the international context, a culling strategy has typically been accompanied by compensation to affected producers, which further highlights the importance of quantifying the economic impact of the disease.

BFAP recently evaluated this impact in terms of a retrospective as well as forward-looking analysis. While key findings are reported in this article, the full report is available from [www.bfap.co.za](http://www.bfap.co.za).

## Larger effect on layer industry

The retrospective analysis considered biological loss, loss of income and direct costs associated with the outbreak. Total cull numbers from the reported AI outbreaks in the broiler and layer industries (up to 8 December 2017) were estimated at around 5,4 million birds.

The effect on the layer industry has been much larger than on the broiler industry, with around 4,7 million birds culled in the layer sector as opposed to around 700 000 birds in the broiler breeder sector. The largest share of layer birds culled was in the Western Cape.

The total biological loss associated with these numbers amounts to just over R317 million. Of this, approximately 75% accrues to the commercial layer industry and its various stages of production. Direct costs associated with the outbreak were around R40,5 million – a conservative estimate given the poor response rate on issues related to direct costs associated with the outbreak.

The total value of lost income as a result of the outbreak is estimated at just over R1,5 billion, which includes income lost from egg sales, pullet sales, day-old chick sales and broiler meat sales. Of this total loss, 85% accrues to the layer industry.

## Restocking strategies

It should be noted that the calculated loss of income is not an instantaneous loss and the impact will be spread over a period of more than two years. It also did not account for company-specific management strategies to mitigate

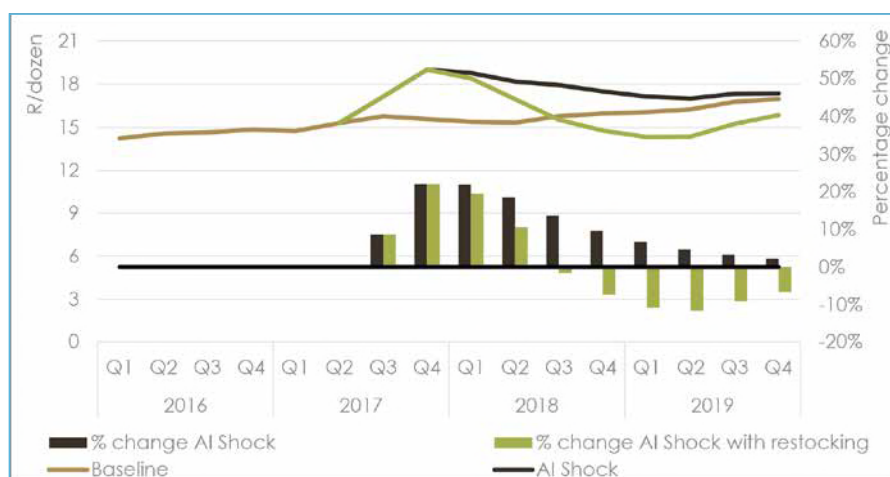
the impact, such as utilisation of excess capacity to reduce the impact on day-old chick volumes in the broiler industry.

The report presents a total loss of around R1,87 billion if biological losses, direct costs and possible loss of income are considered. This represents 18% of the total gross value of egg production in 2016 and 1,6% of the total gross value of animal products in 2016.

The forward-looking analysis was aimed at quantifying the price impact associated with the loss of production, as well as differences in restocking strategies. It focused on the commercial layer industry due to the substantial effect the disease had on this part of the sector. A quarterly partial equilibrium model of the South African layer industry was utilised to evaluate two different scenarios.

The first is a scenario where restocking rates are driven by (current) high priced incentives associated with eggs. In the

Figure 1: Price impact associated with the 2017 HPAI outbreak.



second, a vaccination strategy that allows incremental restocking within the confines of the production cycle is considered. The first scenario resulted in an egg price shock of 22% relative to a baseline simulation, peaking in the first quarter of 2018. The second scenario showed a similar increase of 22% relative to the baseline, but peaking in the fourth quarter of 2017 (Figure 1).

### Increasing egg prices

Simulation results, however, suggest that a vaccination strategy will support growth in production to mitigate the initial impact with around 12%. Ultimately, this strategy, combined with current price incentives, also supports longer term production growth, with prices reaching an equilibrium below price levels considered as a baseline in the simulation.

From a consumer perspective, the price impact of the outbreaks on egg prices was projected to amount to an increase of around R4 per dozen. This was already evident in the last quarter of 2017 and the first quarter of 2018, with Stats SA reporting an increase of between R3,40 and R4,40 per dozen (depending on packaging sizes) at retail level from September 2017 to March 2018.

Although interviewed respondents explicitly expressed support for a comprehensive vaccination strategy, this course of action has several implications. The first relates to trade; vaccinations will have an impact on possible broiler exports, but the threat of imports from countries where HPAI is already endemic seems small given that the current mix of exported cuts from these

countries (specifically China) does not match the current mix of cuts South Africa imports.

The second implication relates to spent hen sales. Under current circumstances, hens are sold to hawkers to be traded in the informal market. Under a comprehensive vaccination strategy, this option is no longer viable, and the hens will need to be slaughtered. The use of a compartmentalised vaccination strategy would mitigate the impact on the live bird market and also protect South Africa from an endemic status.

### Broiler, layer shock in 2018

The second step in the forward-looking analysis was the introduction of the shock in the egg and broiler industries into the BFAP sector model (a dynamic, recursive, partial equilibrium model), which links grains to livestock through feed.

By implication, any shock in the livestock sector will influence the demand and hence also prices of feed grains. This is an important attribute considering that the broiler and layer industries account for more than 60% of feed consumption in South Africa.

Within the broiler industry, the impact of the HPAI outbreak in 2017 was significantly less than in the layer industry, and the restocking process is far less constrained than in layers. Given that the outbreaks occurred only in the breeder flock, a once-off shock is introduced into the broiler sector in 2018.

In the layer sector the production shock from the quarterly model relative to the baseline is emulated in the annual model. This combination allows the impact to be simulated across the rest of the agricultural sector.

The combined impact of reduced broiler and egg production emanating from the HPAI outbreak results in a reduction of 3,8% in maize used as animal feed in 2018, if restocking is based on economic reasons only. When all affected producers are restocked in scenario two, the reduction in maize used as animal feed is 2,8%.

While these percentages may seem small, the AI shock in scenario one results in a reduction of 200 000 tons of maize used in the animal feed industry in 2018, combined with a further 35 000 ton-reduction in soya bean oilcake consumption relative to the baseline.

Figure 2 presents the maize used as animal feed in South Africa under the baseline, as well as the two different AI-related scenarios on the left axis and the percentage change in each scenario relative to the baseline on the right axis.

The impact of the two different scenarios on agriculture's contribution to GDP is small – with both scenarios inducing a reduction of less than 1% per annum between 2018 and 2020, as the price increase for eggs largely offsets the loss in production volume.

### Completely out of production

As with most agricultural sectors, it should be noted that the effect of a disease such as HPAI entailed severe losses in certain areas, while producers not affected in fact benefitted from higher prices. One should therefore not consider the aggregated national impact without noting that affected areas suffered severe losses.

The socio-economic impact of the disease was not included in the study, but it remains a critical consideration. In the Western Cape, a number of farming operations went out of production completely, causing significant losses, both in terms of employment and livelihoods, with no income being generated.

Compensation of such losses is critical when a culling strategy is followed to contain the disease. Despite the decline in production volumes, the nature of the product implies that trade has a very limited role in the domestic market. The disease therefore also results in substantial price increases, which entices some producers to take the risk of expanding production, but also results in much higher cost and reduced consumption levels. 🌱

Figure 2: Feed use impact under both scenarios.

