

## Exploring regional differences pork production costs: perspectives from the agri benchmark initiative

Modern agriculture has been exposed to an increasingly globalised society. Access to the international market has provided consumers with access to a wider range of products, at competitive prices. For the agricultural producer, competitiveness within the global context has become paramount, as increasing trade globally increases the level of competition faced by domestic producers. Pork remains the most consumed meat type globally and over the past 8 years, global pork imports has increased by just over 5% per annum; a fact which can be ascribed to competitive production in countries where surplus production of feed grains has reduced the cost of producing pork, as well as imbalances in demand across regions where income levels and cultures are vastly different. Different regional preferences have allowed producers to maximise the value of a complete carcass through trade, with different cuts in high demand in different regions.

South Africa has been no exception; particularly meat imports have increased substantially over the past decade, with poultry and pork accounting for the greatest increase in import levels. In South Africa, pork remains a small industry within the larger meat complex, however consumption has expanded rapidly over the past decade and with continued expansion of demand projected for the next decade (BFAP, 2014), the ability to meet growing demand with domestic production will ultimately depend on the competitiveness of the value chain in delivering high quality products to the consumer. In 2013, BFAP evaluated the competitiveness of the entire pork value chain in South Africa, however the agri benchmark initiative, in partnership with the Thunen Institute in Braunschweig, Germany provides an opportunity for an in-depth comparison of primary pork production in South-Africa relative to its most important global competitors. The agri benchmark methodology is based on a standard operating procedure, used for the identification of ‘typical farms’ in the main production regions of the countries that have partnered in the network. These typical farms are not considered nationally representative, but rather to be representative of the area in which they are situated. Whilst not statistically representative, the methodology allows for a more detailed comparison, whilst the standard operating procedure and standardised methodology ensures comparability across regions.

The agri benchmark initiative is a global network of specialists aimed at improving the understanding of global farming systems. The pork network is a new inclusion within the agri benchmark initiative, with the first round of data being collected in 2013. Currently the pork network consists of 10 member countries (Germany, France, Spain,

Denmark, China, Vietnam, Russia, Poland, South Africa and Brazil) which represent 80% of global pork production, with the aim of including further members in the future. In South Africa, 3 commercial farms have been identified for inclusion in the network, in conjunction with the South African Pork Producers Organisation (SAPPO). With the pork network still in a developmental phase, a comprehensive understanding of pork production systems in the various partner countries was prioritised within the network, with cost comparisons to be presented upon finalisation of 2013 data. As such, this article presents a comparison of both technical and economic efficiency regionally within South Africa, as well some preliminary information within the global context.

### Relative performance of different production regions in South Africa

SAPPO (2013) estimates that the domestic sow herd in South Africa currently stands around 103 000 sows (compared to 3.8 million in Brazil and 1.1 million in France) and 7000 boars, managed by approximately 240 individual pork producers. Provincial sow numbers suggest that the majority of production takes place in the North West province, KwaZulu-Natal and the Western Cape. Despite this, 43% of pigs slaughtered in 2012 were slaughtered in Gauteng, with 15% in KwaZulu-Natal and 13% in the Western Cape (Figure 1). The regions represented in the agri benchmark study include the Western Cape, Kwa-Zulu Natal as well as a single typical farm that represents large scale producers in the central and northern regions, including Gauteng, North West and the Free State.

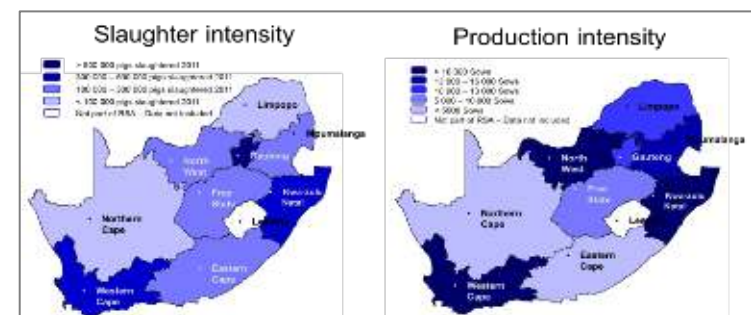


Figure 1: Provincial distribution of slaughters and sow numbers  
Source: BFAP, 2013

### Technical efficiency

From piglet production to fattening and marketing, several indicators exist for the measurement of technical efficiency of pork producers. As an indicator for sow performance and the efficiency of piglet production, Figure 2 compares the relative number of piglets produced per sow per year, as well as the number of pigs marketed per sow per year in the different regions. Within the central region, the number of

piglets born per sow per year was significantly higher, allowing the number of pigs marketed per sow per year to be higher than in the Western Cape, despite lower mortality rates in the Western Cape. Recorded mortality rates were the highest on the KZN farm and as a result, the central farm marketed 5 piglets per sow more than the KZN farm in 2013.

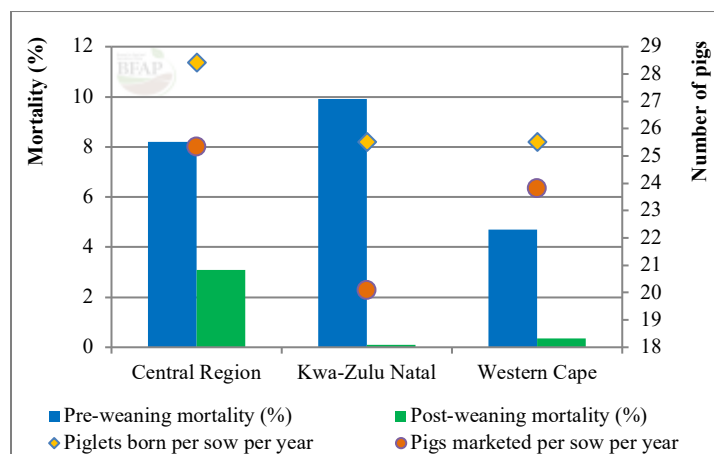


Figure 2: Piglet production efficiency in 2013

Weaning weights and live marketing weights were found to be similar across the regions, with the KZN farm producing marginally heavier pigs. Feed conversion ratios of the three producers showed greater variation however, which is to be expected given the different formulations used by the producers, as well as differences in the genetic material used by the three producers. In the central regions, as well as KZN, producers mixed their own feed, whilst in the Western Cape, many of the raw materials used have to be transported for long distances and hence producers often choose to procure pre-mixed food commercially. In this instance, feed costs are expected to be higher as a result of transportation costs, as well as the margin of commercial feed producers that must also produce profitably. The greatest feed conversion was achieved in the Western Cape (Table 1), where 3.39kg of feed was required to produce 1kg of pork. Despite higher feed conversion ratios, the amount of meat produced per sow in 2013 was highest on the central farm, where every sow accounted for an average of 1757kg of meat in 2013, compared to only 1470kg per sow in Kwa-Zulu Natal (Table 1).

Table 1: Meat production per sow per year

	Central Region	Kwa-Zulu Natal	Western Cape
Meat produced per sow per year (kg)	1757.34	1469.80	1695.41
Feed conversion ratio	3.63	3.89	3.39

### Cost of production

The importance of technical efficiency in determining competitiveness cannot be denied, however the cost of production must also be considered, due to its influence on economic efficiency. Primary pork producers in South Africa have taken several measures to reduce the cost of production, such as mixing their own feed, yet several factors beyond the control of the producer impact on production costs. Undoubtedly the greatest variable cost to the primary producer and therefore the greatest influence on competitiveness is feed, whilst fuel, electricity, wages and cleaning materials are other important considerations.

Figure 3 illustrates the cost of producing a kg of pork across the three regions, as well as the relative cost of feed per ton within each region. In this context, cost of production is also influenced by the technical efficiency parameters as the cost per kg of meat produced will be lower when the amount of pork produced per sow is higher. Despite the fact that the best feed conversion ratio was recorded in the Western Cape, feed costs per kg meat produced remains lower in the central region due to lower feed prices. The average cost of feed on a per ton basis was significantly lower in the central region relative to the two coastal regions (Figure 3).

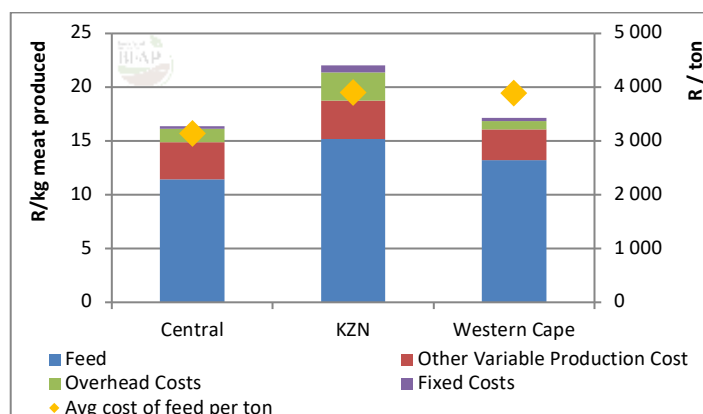


Figure 3: Pork production costs across regions

Reduced feed costs can be attributed to factors such as differences in formulation, as well as the cost of raw materials. In the Western Cape, feed is procured commercially, in pre mixed form and hence the expectation would be for feed to be more expensive, however the highest feed costs on a per ton basis was recorded in KZN, where feed is mixed on farm. Figure 4 also illustrates that raw material usage is very similar in KZN and the Central region, both regions where producers mix their own feed on the farm. The difference in the cost of feed is therefore attributable to the cost of raw materials, rather than differences in the raw materials used, providing a clear indication that proximity to the main feed grain producing regions provides a significant cost advantage for pork producers.

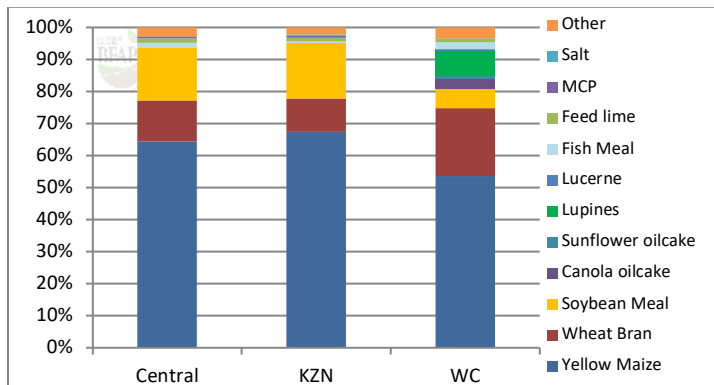


Figure 4: Regional breakdown of raw material usage for pig feed

In the Western Cape, raw material usage in feed rations differed significantly from the other two regions, as usage of locally available raw materials such as lupines and wheat bran is much higher, while yellow maize and soybean meal usage is lower in order to increase the competitiveness of feed costs. Nevertheless, yellow maize still accounts for more than half of the total feed ration and given the transport costs, feed rations remains substantially more expensive than in the central regions.

Apart from feed costs, the regional differences in other variable production costs are marginal (Figure 5). Veterinary, AI and transport costs are almost identical, while small differences are evident in labour costs, which are marginally higher in Kwa-Zulu Natal. The observed differences are minor however and hence the low variable production costs in the central region relative to the coastal regions can be attributed to improved technical efficiency as well as reduced feed costs resulting from cheaper raw materials.

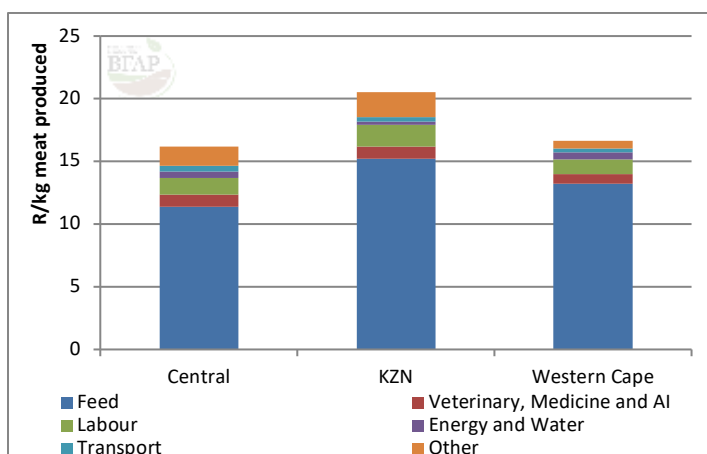


Figure 5: Regional breakdown of variable production costs

### Profitability

Due to the costs and risks associated with transportation of pigs to abattoirs, producers have few realistic options of

delivery when pigs are marketed and hence differences in profitability across regions could result from differences in production costs, as well as differences in prices received. While significant variability is evident in the cost of production across regions, producer prices recorded in 2013 were similar (Figure 6). Marginally higher prices were recorded in the central region, however porkers are generally marketed at a premium to baconers and as the share of porkers in total number of carcasses marketed on the farm in the central region is higher, higher average prices per kg are to be expected

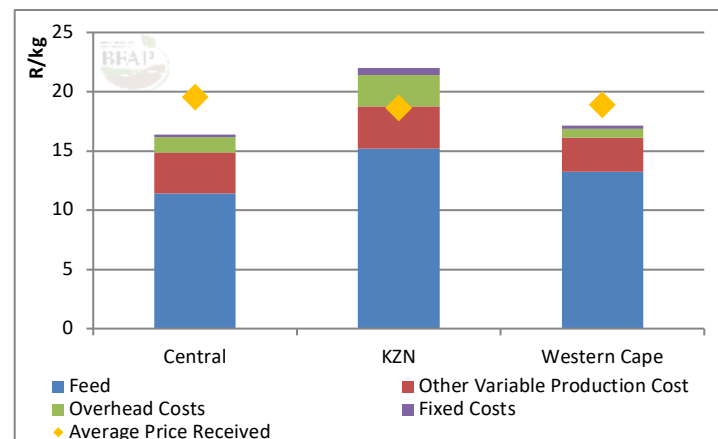


Figure 6: Regional comparison of production costs and prices

Margins obtained per kg meat produced were highest in the central region, where returns were the highest and cost of production the lowest. Returns in the coastal regions were similar, however high costs of production in KZN resulted in negative margins in 2013, while a small positive margin was achieved in the Western Cape (Figure 6). The benefits of economies of scale are evident, as the medium scale producer in KZN recorded a loss, mainly attributable to high feed costs, while the large scale producers in the Western Cape and Central regions maintained a positive margin in a year when feed grains were particularly expensive as a result of draught conditions. When margins are tight, as was the case in 2013, scale of production becomes an even greater advantage. Achieving economies of scale benefit in a capital intensive industry is costly and hence the return on investment presents a credible comparison of economic performance, regardless of the size of the enterprise. The margin achieved on the central farm, the largest of the 3, equated to a return of 10.45% on capital investment. Louw *et al.* (2011) indicate that acceptable net profit margins for South African pork producers are between 10%-15%, with returns greater than 15% considered exceptional. Returns below 10% were however considered too risky given the capital investment required as well as the associated levels of risk.

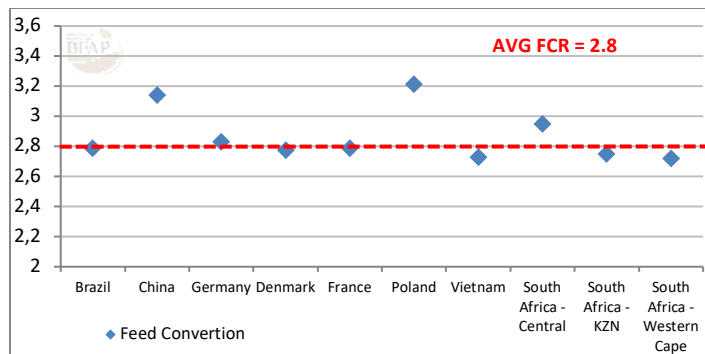
### Preliminary global comparison

A basic comparison of technical performance of the three South African farms in the global context is illustrated in Table 2 and Figure 7. Considering breeding performance, the large scale producer in the central region achieved results comparable to top exporters like Brazil, France and Germany (Table 2), while the two coastal producers weaned fewer piglets per sow.

**Table 4: Comparing breeding performance**

	Brazil	France	Germany	RSA - KZN	RSA - WC	RSA - Central
Cycles per year	2.48	2.33		2.31	2.45	2.4
Piglets weaned per sow per year	26	26	25.5	23.0	24.3	26.2

Given the difference in production systems globally, total feed conversion ratios calculated for farrow to finish systems are not comparable to feed conversion ratios calculated on specialised finishing farms in Germany for example. In order to compare feed conversion credibly, feed conversion ratios were recalculated only for grower pigs, based on feed usage and weight gained in the grower barn. South African producers performed very well relative to global competitors in this context, with feed conversion ratios in all three regions being recorded below the average achieved in the network. In fact the feed conversion achieved in the Western Cape was the best recorded for all producers in the network.

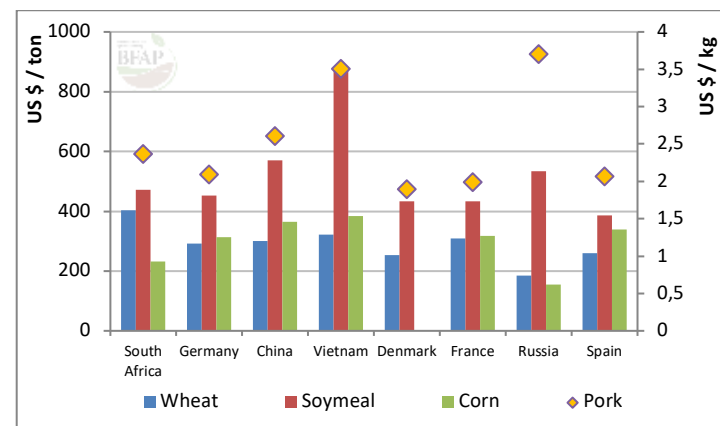


**Figure 7: Feed conversion ratios - Global comparison**

Feed conversion in the grower barn only was higher in the central region than in the two coastal regions. This fact is attributable to the fact that piglets enter the grower barn at a later stage. Feed conversion performance declines as pigs grow older and heavier and as such, the recorded feed conversion in the grower barn of the central producer is expected to be higher relative to other producers. Starting weights recorded in the other countries illustrated in Figure 7 were similar to those achieved in South Africa's coastal regions.

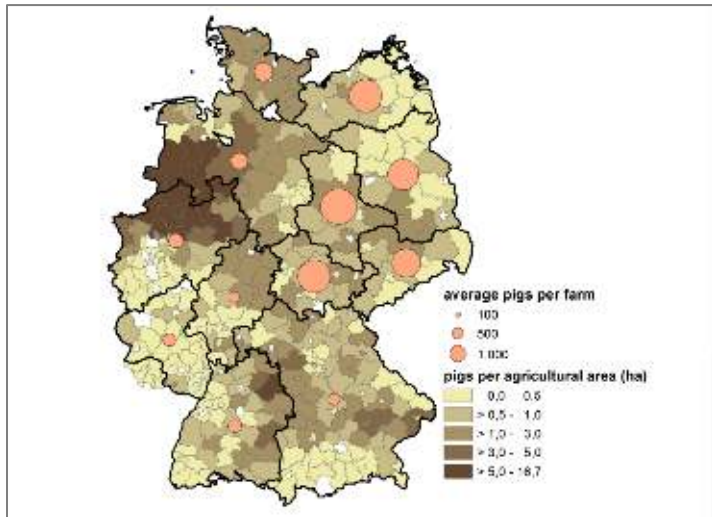
Feed constitutes the greatest component of variable production cost and while total feed cost data is not yet

available from the various partners in the network, Figure 15 relates the cost of the three most important raw materials used in pig feed, as well as prices received per kg carcass weight in various countries. As a surplus producer, South African maize costs compare well with global norms, however as a net importer, the cost of wheat in South Africa was higher than any other country in the network. South African soybean meal was also more expensive than in European countries, however soybean meal costs compared well relative to Asian countries (Figure 8). The highest pork prices were recorded in Asia, particularly Russia and Vietnam, while South African pork producer prices reported in 2011 was above EU prices and below Asian prices.



**Figure 8: Prices of pork and feed grains in 2011**

Germany represents South Africa's most important trade partner, with the bulk of imports into South Africa originating from Germany. Pork production in Germany is much bigger than in South Africa, with more than 30 000 producers compared to approximately 240 commercial producers in South Africa. Pork production in Germany is typically specialised in piglet production or pig fattening, as opposed to the South African system which is typically farrow to finish units. The bulk of German production occurs in the North-Western part of the country (Figure 9). As a net exporter of pork products, German prices reported in 2011 were higher than in South Africa. Wheat and Soybean meal prices were reported lower in Germany than in South Africa, while maize prices in South Africa were below those reported in Germany.



**Figure 9: German pork production**  
Source: agri benchmark, 2012

### Concluding remarks

South Africa joined the agri benchmark network with the objective of measuring and understanding the competitiveness of primary pork production within the global context. Whilst some preliminary indications are presented in this article, the network remains newly established and hence the benefits of membership will become increasingly evident in the longer term, as time series of annually collected data becomes available. Availability of additional international data will no doubt result in more meaningful global comparisons and cost benchmarking, however South African data has already provided valuable insight into the relative competitiveness of different production regions in South Africa. A single year's data remains a static snapshot however and multi-year comparisons will become increasingly valuable as annual data updates continue. Furthermore, the data collected at farm level will be linked to the BFAP baseline projections through a farm-level financial simulation model, increasing the available tools to guide decision making within the sector.

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