Projected protein requirements for animal feed consumption in South Africa

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Over the past few years, the grain and oilseeds industries have realised the importance of the animal feed industry and the impact it has on demand structures. In South Africa, this has become even more evident as local production of soya beans increased substantially over the last ten years. This led to growth in local processing, creating additional local supply of oilcake for the animal feed industry.

The recurring question within an agricultural value chain is whether local demand will be enough to consume the produce should there be an increase in supply. In a complex supply environment such as with proteins, this is always a difficult question to answer.

The Protein Research Foundation (PRF) annually funds a research project to do projections and provide an indication of consumption trends. In order to do these projections, two models are utilised, the first being the well-known projections by the Bureau for Food and Agricultural Policy (BFAP) in terms of production and trade of commodities, population forecasts, per capita consumption of protein products and commodity prices.

The BFAP data is then used as input data within the agricultural product requirements (APR) model. The APR model is a least-cost optimisation feed simulation developed by Dr Erhard Briedenhann, which calculates the animal feed consumption of different animal species.

Base scenario for 2020

Based on the BFAP data, the APR model was used to calculate a base scenario for the 2020 season. Based on the 2020 per capita consumption of animal products, it is estimated that the requirement for animal feed in South Africa is 11,9 million tons (*Table 1*). Broilers and beef cattle are the biggest consumers of animal feed.

The model calculates various raw materials within the animal feed industry. However, based on oilcake, consumption of soya oilcake tops the list at 1,2 million tons, followed by sunflower oilcake at 351 480 tons (*Table 2*). Total consumption of oilcake within the base scenario is 1,9 million tons.

Given the increase in the production of grain and oilseeds, it is vital for the local industry to substitute imported products with locally processed products. On the local market, South Africa progressed well in terms of substituting imported soya oilcake with local oilcake. In 2020, local soya oilcake made up 70% of total oilcake requirements (this was only 16% in 2009). In terms of total oilcake, the local share increased from 34% in 2009 to 79% in 2020.

Projections of protein requirements

In order to project the consumption figures of the different species, it is important to determine demand.

Demand was calculated using the following macro variables obtained from the BFAP, in combination with animal feed conversion ratio (FCR) growth figures and animal feed matrixes:

- Population growth.
- Per capita consumption growth.
- Imported animal products.
- Exported animal products.

Based on these projections, total animal feed will have increased with 8,35% by 2023 and with 21,47% from 2020 to 2029. Oilcake consumption will have increased with 16,3% from 2020 to 2029, while an increase of 17,6% is projected for soya oilcake consumption.

As previously stated, soya oilcake remains the dominant protein source in South Africa. This dominance has increased over time and will continue to do so.

Table 1: National animal feed production in 2020.

Feed types	National feed consumption (ton)
Aquaculture	5 000
Beef cattle	2 894 960
Broiler	3 320 366
Dairy cattle	2 568 226
Horses	124 205
Layers	1 326 955
Ostriches	83 823
Pets	359 304
Sheep	254 145
Pigs	1 036 398
Various	10
Total	11 973 392

Table 2: Usage of different oilcake in 2020.

Oilcake type	National consumption (ton)
Cotton full fat	20 483
Soya full fat	240 000
Canola oilcake	55 000
Soya oilcake	1 213 700
Sunflower oilcake	351 480
Palm kernel meal	5 000
Total	1 885 663

Table 3: Oilcake usage projection in 2023 and 2029.

Raw material	National consumption per year		
	2020	2023	2029
Canola oilcake	55 000	76 190	93 483
Cotton full fat	20 483	20 483	26 000
Palm kernel meal	5 000	5 701	6 000
Soya full fat	240 000	240 000	290 000
Soya oilcake	1 213 700	1 218 087	1 427 406
Sunflower oilcake	351 480	374 748	410 925
Total	**1 885 663**	**1 935 209**	**2 253 814**

Table 4: Projected national animal feed production in 2023 and 2029.

Feed type	National feed consumption per year (ton)		
	2020	2023	2029
Beef cattle and sheep	3 149 104	3 507 445	3 975 199
Broiler	3 320 366	3 575 615	4 093 900
Dairy	2 568 226	2 661 446	2 855 846
Layers	1 326 955	1 427 903	1 490 083
Pigs	1 036 398	1 177 981	1 452 286
Other	572 342	623 116	676 969
Total	**11 973 392**	**12 973 505**	**14 544 284**

Future consumption figures are highly influenced by the FCRs. With the constant increase in FCRs, the projected consumption stabilises over time. However, exports of beef, mutton and the prospect of poultry exports increase the consumption of feed and have a major impact on projected end consumption figures for 2029 (*Table 3* and *4*).

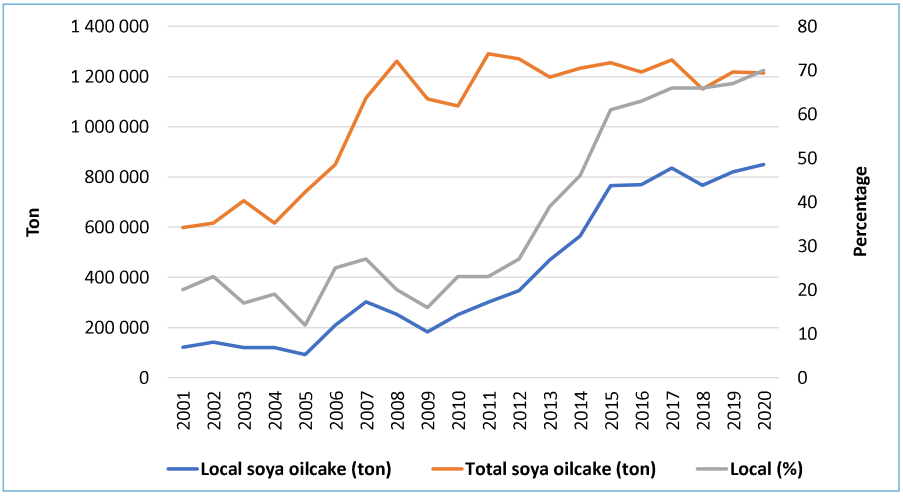
In terms of substituting imported oilcake, the increase in local oilcake production from locally produced soya beans, will make South Africa increasingly self-sufficient in terms of protein requirements (*Figure 1*).

Soya oilcake produced in South Africa in 2020 provided 79% of the country's soya oilcake requirements. It is projected that this can increase to 97% in 2023 and to 100% in 2029. According to the projections, feed requirements will increase to 12 973 505 tons in 2023 and to 14 544 284 tons in 2029. Soya oilcake requirements will be 1 218 087 tons by 2023 and 1 427 406 by 2029.

What needs to be kept in mind is that logistics still create challenges in terms of competing against imports. Thus, the projection indicates the supply and demand that can be expected. However, market dynamics need to be sufficient in order to supply oilcake at competitive prices, specifically in the coastal regions. In order to meet the projected local demand, 1 784 257 tons of soya beans need to be produced in 2029.

Broiler and layer diets play an enormous role in the grain and oilseeds industries. Growth and sustainability in the poultry industry will also play

Figure 1: Growth in self-sufficiency in terms of soya oilcake.



a major role in oilcake requirements in the future. The second biggest role-players are the beef cattle and sheep industries. It is vital for all these industries to improve and efficiently manage biosecurity in South Africa.

> Based on the 2020 per capita consumption of animal products, it is estimated that the requirement for animal feed in South Africa is 11,9 million tons.

This will increase export growth and sustain the consumption of animal feed in the local market. Other than normal population growth figures, the largest contributor to animal feed consumption increases are the exportation of products such as mutton, beef and poultry. This needs to be sustained in order to keep up with local soya bean production and provide opportunities for local processing.

If these exports are not sustained, the surplus soya beans produced will need to be exported. In any economy, the goal would be to rather process and consume these commodities within the local market, which will benefit local producers as well as consumers.

South Africa can be self-sufficient

The prospects of feed for animal protein look promising. However, these prospects are highly dependent on certain factors. With increasing efficiencies in FCRs, it is important to find additional demand (predominantly found in the exportation of animal products).

Other crucial factors are the prices of and competition for raw material. In order to utilise these local consumption levels, raw material prices tend to be closer to export parity levels. This means that a lot of work will need to be done to increase the feasibility of producing raw material at these levels.

The raw protein material basket is complex and any slight change in one raw material affects the utilisation of oilcake, specifically soya oilcake. If there is an increase in production or imports of a protein source, it will have a direct impact on the consumption of soya oilcake.

Lastly, logistics and biosecurity will play a crucial role in the future. If the export market for animal products cannot be expanded, there will be pressure on utilisation in South Africa, which has a direct impact on production. If all the aforementioned fall into place, South Africa can be entirely self-sufficient while leaving room for an increase in soya bean production.

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