Forecast estimates of protein requirements for animals in South Africa.

Project 2016

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Unit for Livestock Economics

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PROJECTIONS OF OILCAKE REQUIREMENTS FOR USE IN ANIMAL FEED IN SOUTH AFRICA FROM THE YEAR 2015 TO THE YEAR 2025

1. Introduction

The Protein Research Foundation (PRF) has as its main objective the replacement of imported protein with domestically produced protein. After many years of investigating numerous alternatives the focus changed mainly to where the largest impact could be made namely soybeans and canola.

The growth in the domestic availability of oilcake is a good measure by which the PRF could ascertain if it was achieving its objectives, by way of supporting the industry with research, new technology and technology transfer. The targets that will need to be met in the future for the PRF to continue to emulate the great progress that has been made thus requires projections of future oilcake demands and what will be required to obtain self-sufficiency, as well as when this goal is likely to be met.

To accurately measure this progress various models were developed and used over the years. A new model has been developed.

2. The new model methodology

Collaboration between the University of Free State Agricultural Economics department, PRF existing APR model and BFAP, created a new successful model that can accurately calculate current protein requirements and project future requirements under various scenarios.

The model considers changes in per capita consumption of meat, milk and eggs as projected by BFAP as well as population growth, the quantity of meat, milk and eggs that are predicted to be imported and exported are also considered. Projected future prices of major raw materials are incorporated as well as the availability of raw materials, mainly those that are derived as by-products from various agricultural processing industries.

The genetic improvement of animals has a substantial impact on productivity, therefore changes in animal performance is an important factor that the model incorporates. The model calculates the quantity of feed required as well as raw material breakdown for these feeds.

There are several animals that are not producers of meat, milk and eggs that consume a substantial amount of animal feed including protein. The feed consumption of these animals including the protein materials also needs to be accounted for.

The model has the ability by making use of least cost linear programming considering transport costs of raw materials across various regions of the country to formulate the actual

feeds required by all animals in South Africa given the constraints of which quantity of raw materials will be domestically available.

The result is an accurate prediction of protein requirements and projection of protein requirements both domestically and imported.

3. Results

3.1. Current scenario

Based on the current per capita consumption of animal products it is estimated (using the APR Model) that the requirement for animal feed in South Africa is as follows:

Table 1: National animal feed production 2015/16

Feed Type	National feed consumption (ton)
Dairy	2 136 384
Beef & Sheep	3 512 035
Pigs	905 977
Layers	1 276 342
Broilers	3 323 278
Pet foods	325 789
Horses	135 670
Ostriches	116 063
Aquaculture	5 200
Total	**11 736 738**

Table 2: Oilcake usage for 2015/16

Oilcake type	National consumption (ton)
Soya oilcake	1 204 436
Sunflower oilcake	400 000
Cotton oilcake	98 000
Canola oilcake	68 255
Palm Kernel	30 000
Soya Full Fat	120 000
Cotton Full Fat	42 600
Canola Full Fat	2 000
Total	**1 965 291**

Table 3: Historical usages of oilcake (Local and imported soybeans processed in South Africa)

Year	Local Soya (ton)	Total Oilcake (ton)	Local %
2008/09	565 181	1 664 916	*33,9*
2009/10	701 030	1 743 137	*40,2*
2010/11	624 912	1 857 391	*41,3*
2011/12	766 927	1 856 360	*41,3*
2012/13	760 321	1 877 671	*40,5*
2013/14	913 356	1 889 979	*48,3*
2014/15	1 197 604	1 914 330	*62,6*
2015/16	1 238 120	1 965 291	*63,0*

3.2. Growth in requirements for animal products

The population of South Africa per BFAP's current projections will increase from 54,7 million in 2015 to 57,67 million in 2020 and 58.4 million in 2025.

The per capita poultry consumption will increase from 35,18kg in 2015 to 39,47kg in 2020 and 42kg in 2025. The number of breeders required to sustain the broiler production will increase from 7,96 million in 2015 to 8,81 million in 2020 and 9.47 million in 2025.

Egg consumption is expected to increase from 7,48kg per person to 8,58kg in 2020 and 9,39kg in 2025. Beef consumption is expected to increase from 16,6kg to 18,57kg in 2020 and 21.32kg per person in 2025. Milk consumption will increase from 54,81 litres to 60,38 litres per person in 2020 and 67.18 litres per person. Pork consumption shows slow growth from 4,05 to 4,62kg per capita in 2020 and 5.16kg in 2025, while growth in mutton consumption is even more modest only increasing to 2,65kg in 2020 from 2,53kg in 2015. The per capita consumption for mutton in 2025 is 2.66kg per person.

Table 4: Projections of feed and oilcake requirements to the year 2020 and 2025

	Feed (ton)	Oilcake (ton)	Soya Oilcake (ton)
2015	11 673 382	1 965 879	1 324 436

2020	12 767 149	2 074 931	1 537 927
2025	14 624 422	2 675 374	2 112 764

Soya oilcake remains the dominant protein source in South Africa, this dominance has increased over time and will continue to do so. Soya oilcake in 2010 made up 40% of oilcake requirements, this increased to 67 % in 2015 and is predicted to increase even further to 74% in 2020 and 76% in 2025.

Poultry feeds make up only 39% of total feed consumed in South Africa, this market share of total feed is predicated to remain constant until 2020. Most oilcake is however used in this sector with a share of 83% of soya oilcake usage currently in this sector expected to remain relatively stable up to the year 2025.

3.3. Local Soya Oilcake Production (Including Full fat soya)

The increase in local oilcake production from locally produced soybeans will make South Africa increasingly self-sufficient in protein requirements.

Table 5: Local vs imported soya oilcake

	Local Soya Oilcake (From local soybeans) ton	**Local Soybean Production (required) ton**	**Total Soya Oilcake Requirements ton**	**% Local**
2015	563 578	741 550	1 324 436	42,6
2020	1 216 000	1 600 000	1 537 927	79,1
2025	1 596 000	2 099 000	2 112 764	75,5

Table 6: National animal feed production 2020 snd 2025

Feed Type	**National feed consumption 2020 (Ton)**	**National feed consumption 2025 (Ton)**
Dairy	2 295 316	2 606 020
Beef & Sheep	3 908 470	4 650 657
Pigs	1 059 825	1 249 668
Layers	1 400 394	1 609 675
Broilers	3 437 963	3 728 545
Other	665 181	779 854
Total	**12 767 149**	**14 624 422**

Table 7: Oilcake usage projection 2020 and 2025

Oilcake	**2020 Ton**	**2025 ton**
Soya oilcake	1 444 627	1 782 778
Sunflower oilcake	384 526	434 716

Cotton oilcake	37 424	44 033
Canola oilcake	88 795	123 786
Palm Kernel	12 381	14 447
Soya Full Fat	93 300	104 380
Cotton Full Fat	48 553	53 734
Canola Full Fat	2 749	3 629
Total	**2 074 931**	**2 561 503**

4. Conclusion

Feed requirements will increase to14 624 422 tons in 2025 and 12 767 149 tons in 2020 from 11 736 738 tons. Oilcake requirements will increase from 1 965 291 tons to 2 074 931 in 2020 and 2 561 503 tons in 2025. Soya oilcake requirement will be 1 537 927 tons by the year 2020 and 2 112 764 by 2025.

The poultry sector plays a major role in oilcake and particularly soya oilcake usage. Growth and sustainability in the poultry industry will play a major role in oilcake requirements.

For South Africa to achieve 79% of soya oilcake requirement self-sufficiency by 2020 the country will need to produce 1, 6 million tons of soybeans, to achieve 76% by 2025 the country will need to produce 2,1 million tons of soybeans.