Feeding Sustainable Soya

TECHNICAL UPDATE | MAY 2019

The World demand for soya beans is growing every year because of the increasing human demand for soya oil to meet population growth (Sustainable Food Trust). Approximately 80% of soya oil is used for human food, and 20% for industry, pharmaceuticals and biodiesel.

If soyabean production was to be restricted then there is likely to be a switch to increase palm oil production to meet the growing demand for edible oil. Soyabean meal, the high protein by-product remaining after the oil has been extracted, is mainly used for pig and poultry feed, as monogastrics have a high demand for lysine and struggle to digest some of the other high protein feeds used in ruminant diets.

Kite does not recommend feeding soya as a primary source of protein for dairy cows and ruminants as we believe there are other options, particularly rapeseed meal. However, if a farmer wants to feed soya then the RTRS scheme (Round Table on Responsible Soya Association) or the Cargill Triple S scheme are a positive step forward from just feeding soya, but there are potential problems with such schemes.

Kite's current position feeding rapeseed meal

Kite has been recommending rapeseed meal as a low carbon, nutritionally superior (owing to its higher methionine to lysine ratio) and more cost-effective protein for dairy cows since 2010. This recommendation is in Kite's Ethical Statement (available on the website) and it was supported by research work at the time. This was reinforced in 2013 when a scientific paper published by Marlineau *et al* reported on a meta-analysis of 49 experiments which confirmed the benefits of using rapeseed meal in place of soya bean meal for milk production.

Table 1: Meta-analysis response to feeding rapeseed meal in place of soya

	Meta-analysis response
Dry matter intake, kg/day	+0.29
Milk yield, kg/day	+0.73
4% fat corrected response, kg/day	+0.52
Protein %	+0.0016
Fat %	-0.048

Now, very few Kite farmers feed soya bean meal as the main protein (estimated to be less than 7%) but the situation is changing because of a decline in rapeseed meal production in Europe due to:

1. The ban on neonicotinoids which has made rapeseed production more difficult, expensive and less viable for arable farmers.

2. A reduced demand for rapeseed oil for biodiesel, as diesel cars become less popular, and as crushers switch to soya and palm oil because they are cheaper.

3. A reduction of the EU tariffs on soya oil imports for biodiesel from September 2018 and the trade war between the USA and China (which has resulted in even more soyabeans coming onto the market).

4. The increase in soya seed production around the globe, forecast to be up 8% in 2019 on last year's production levels.

5. The fact that oil seed crushers prefer soya instead of rape because supplies of soya seed are more plentiful, and the higher price of soya oil for the human market means that the crushers make an extra €20/tonne crushing soya (Data from CRM Agri Commodities).

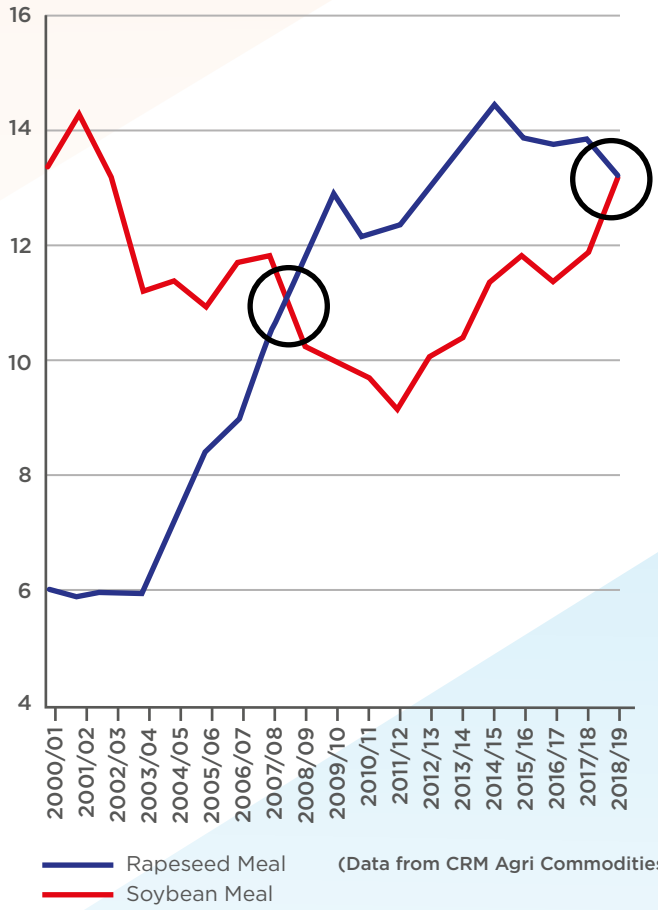
Table 2: Estimates of the size of the 2019 EU rapeseed crop, showing a 19.9% decline in rapeseed planted area and a 8.9% reduction in yield compared with 2018, along with forecasts for the main rapeseed producing nations in the EU.

2019 CRM	Area (Kha)	vs2018 (in%)	5-yr avg Yield (T/ha)	Prod (in KT)	vs2018 (in%)	vs2018 (in KT)
EU	5578	-19.9%	3.22	17946	-8.9%	-1752
Czech Republic	391	-5.1%	3.42	1337	-3.3%	-46
France	1111	-30.0%	3.43	3813	-21.8%	-1064
Germany	1004	-18.1%	3.62	3632	-0.9%	-34
Hungary	267	-22.0%	3.10	829	-16.0%	-158
Poland	718	-15.0%	2.77	1992	-3.7%	-76
Romania	327	-50.0%	2.61	853	-43.7%	-662
United Kingdom	560	-10.0%	3.55	1988	-3.1%	-63

(Data from CRM Agri Commodities)

In the last four years there has been a significant decline in rapeseed meal production, suggesting that it could become more difficult to source in the years ahead, and milk producers may be forced to switch back to feeding more soya bean meal than they are now. In the last six months, soyabean meal (which is 44% protein as fed) prices in the UK have fallen by £30-£40 to around £280/tonne, but rapeseed meal (which is 36% protein as fed) has remained at around £200-£210. This is starting to make rapeseed meal appear less cost effective and could result in farmers switching to soya in the months ahead to reduce feed costs.

Table 3: Showing how EU Production of rapeseed meal in the EU (in blue) has been falling since 2015 while soyabean meal production (in red) is increasing, in millions tonnes/year.



(Data from CRM Agri Commodities)

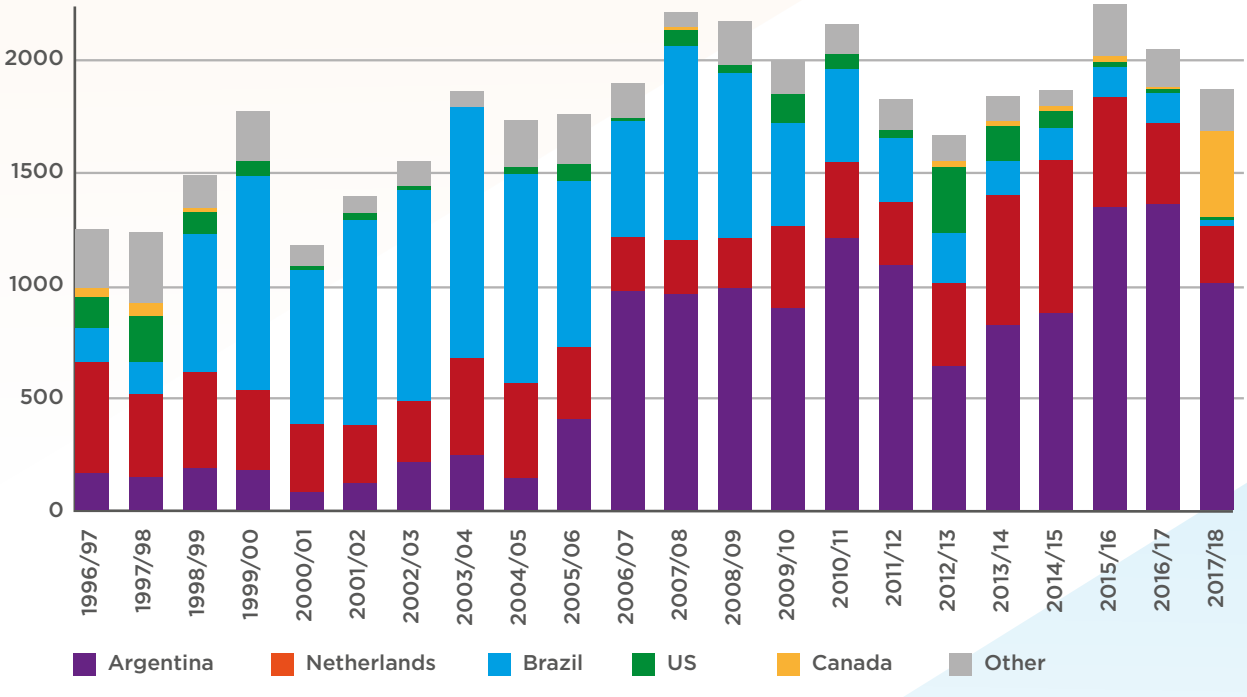
Sustainable soya with zero deforestation

Most soya bean imported into the UK comes from North America and Brazil and most soyabean meal comes from Argentina.

Currently there are feed suppliers in the UK sourcing sustainable soya, where they pay for a Sustainable Soya Certification, under the RTRS Agreement, or one of the other schemes.

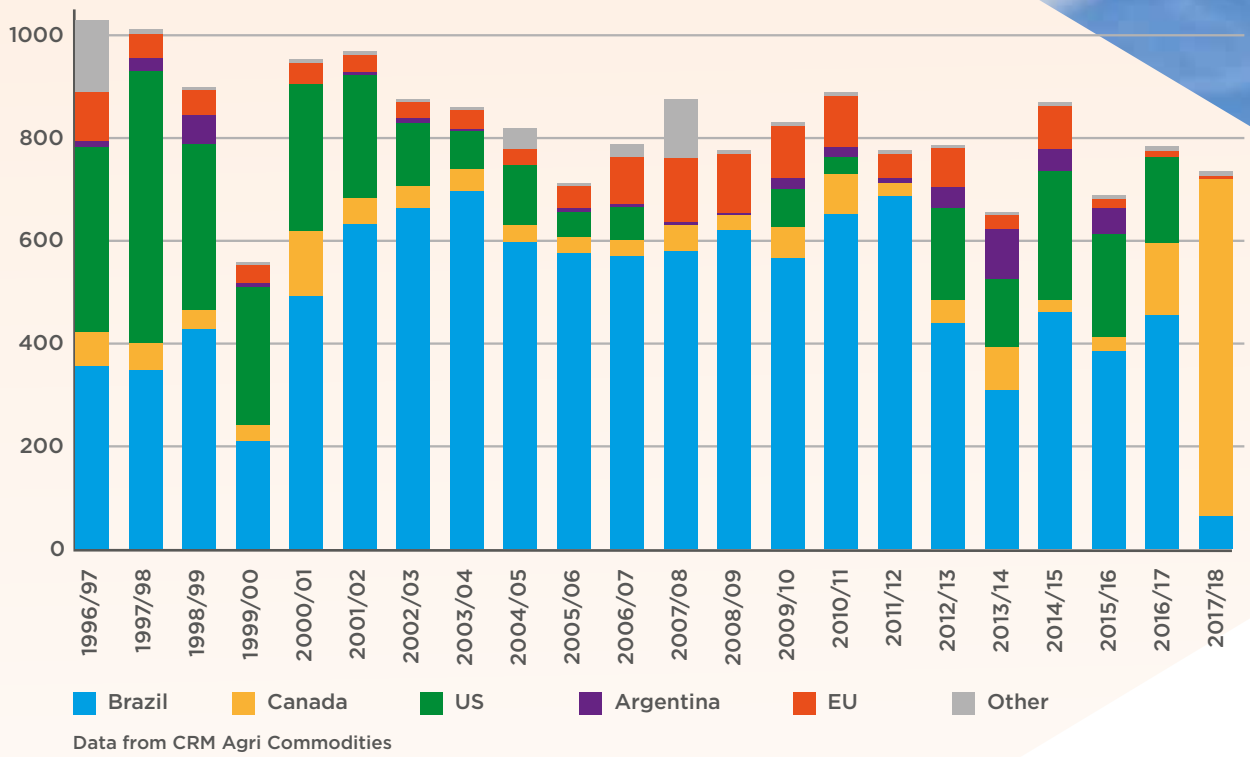
The following tables show the origin and quantity of soya bean meal, and soya beans imported into the UK, and how the market has changed. It shows Argentina now dominating the meal market, supplying 45% of the imported meal, and Canada dominating the bean market last year when South American crops suffered weather problems.

Table 4: UK Soymeal Imports by Country (in KT)



Data from CRM Agri Commodities

Table 5: UK Soybeans Imports by Country (in KT)



Data from CRM Agri Commodities

Areas of concern

- There appear to be significant concerns in the feed industry about where the soya has come from, and the potential for infringements, especially in South America where there may be the risk of sustainable and unsustainable soya becoming mixed up, and where it has been suggested that corruption levels are high.

- The definition of sustainability and zero deforestation in the international feed industry is very different to that of the Intergovernmental Panel on Climate Change (IPCC) or the Carbon Trust, who are unlikely to allocate a lower carbon footprint for zero deforested soya. In their view the soya would need to grow on land which has not been in forest for over 100 years, because of the quantity of carbon released.

- In 2006 the grain companies in Brazil signed up to the Amazon Soy Moratorium which offered some protection to the rain forest, until the goal posts were moved to 2008, but this does not protect the Cerrado Savanna where soya growers have allegedly aggressively cleared millions of acres of biodiverse habitat, and it does not protect the Tapojo's river basin at the heart of the Amazon from industrialised development **https://lab.org.uk/tapajos-under-attack-9-amazon-soy-moratorium-defeating-deforestation-or-greenwash-diversion/**.

- In the UK it is very difficult for farmers to know where their soya has come from as the UK industry is not very good at passing this information on.

- When buying dairy compound feeds, feed manufacturers tend to be reluctant to divulge everything that is contained in their formulations. The compounders have to declare a list of ingredients used under Feeding Stuffs regulations, but not the inclusion levels or origin of the ingredients.

- Pig and poultry feed mills tend to use a narrow range of ingredients which makes it easier for them to handle, store and audit in specialist mills.

- Ruminant feed mills use a much wider selection of ingredients because ruminants can utilise fibrous feeds such as beet pulp, sunflower and palm kernel, which creates specific problems. Owing to tight auditing regulations in the UK feed industry, it is very difficult for one feed mill to run conventional feed, medicated feed, and organic feed through the same mill because of the logistical problems, potential for cross contamination on production lines, and the extra costs and down time involved in cleaning the mill between runs. As a result, feed mills have become more specialised and species specific. So organic feed is only produced in a small number of mills in the UK and lamb and calf feed containing medication to prevent coccidiosis is only produced in a couple of locations.

- The relevance of this is that if the feed mill contained more than one type of soya the extra cost of sustainable soya would add logistical problems and costs for the extra haulage and storage, making their feeds more expensive than the conventional mills. The manufacturing of concentrates or blends containing sustainable sourced zero deforestation soya could therefore carry a significant premium because of the logistics involved with such a feed for the manufacturers. However if the compounder was already working with 100% sustainable zero deforestation soya then the only extra cost would be that of the zero deforested soya and the certification certificate.

Effect of zero deforested soya on dairy farming.

As previously stated, Kite has been recommending rapeseed meal as the primary vegetable protein for milk production since 2010 because rapeseed meal is more cost effective, is nutritionally superior and has a lower carbon foot print than soya.

Replacing either two or three kg of soyabean meal with rapeseed meal typically saves between £9,300 and £13,700 off the purchased feed costs over a 12 month period for a herd of 150 cows. In the last three months soya bean meal prices have fallen due to the trade war between the US and China, which has resulted in a 30 million tonne surplus of unsold soya bean in the US. The price of soyabean meal in the UK has fallen from £330 to £280 per tonne. This has reduced the savings of feeding rapeseed meal for a herd of 150 cows down to between £3,285 and £6,022 over a year. It seems likely that the US and China will resolve their differences in the next few months with the US presidential election approaching. When this happens the improved performance (illustrated in Table 1), and savings in feed costs from feeding rapeseed meal are likely to return to between £9,000 and £13,700 per year, provided rape seed meal production is maintained in Europe.

In addition, rapeseed meal has a lower carbon foot print or Global Warming Potential figure over 100 years (GWP100) which is approximately one tenth that of soyabean meal. For an efficient herd averaging 9,250 litres of milk production per year, with a typical carbon foot print of around 918g CO2/litre of fat corrected milk, feeding soyabean meal at between two and three kg/head/day to match energy and protein levels in equivalent rapeseed meal diet would increase the carbon footprint of the milk production to 1,277 to 1,540g/litre of milk respectively.

Summary

Despite the ethical sounding benefits of zero deforested soya, there are some issues:

- **the increased cost of feeding soyabean meal in place of rapeseed meal to dairy cows.**
- **the increased carbon footprint of the milk produced from feeding soya.**
- **the challenges and extra costs associated with sourcing zero deforested soya.**

All of this means that zero deforested soya bean meal will not be as good for the dairy farmer or the environment as feeding rapeseed meal, or one of the commercially protected rapeseed meals.

Rapeseed meal is a nutritionally superior source of protein for dairy cows and is a non GM crop.

As an industry we should continue to strive to feed rapeseed meal for as long as we can. For those farmers who continue to insist on feeding soya there are protected rapeseed options which are perfectly good alternatives.

Feeding lower protein diets, down towards 16.0% of diet dry matter, would reduce ammonia, nitrous oxide and manure nitrogen emissions off farms, and thereby reduce the need for purchased protein. Farmers need to look to make more use of the protein in grass and grass silage. There are challenges with feeding lower protein diets, but research recently published by Reading University and elsewhere shows that it can be done, and we already have some high yielding herds feeding such diets. This also would help the dairy industry to comply with new clean air legislation which is being proposed.

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