

The role of soya and oilseeds in the vegan food revolution

By *Claudi Nortjé*

Soya-based foods are known for their high protein content and versatility when it comes to adding nutritional value to a meal, which is why vegans across the globe are incorporating more soya into their diets. When compared to other legumes, soya beans differ vastly in macronutrient content – it is higher in unsaturated fat and protein, but contains relatively low levels of carbohydrates.

A British study that included 570 vegetarian and 102 vegan women, found that an average of 11,2g of soya protein were consumed daily. Only 27% of the vegans consumed less than 5,9g/day; the same was true for 86% of the vegetarians in the study. Western vegans usually consume around 10 to 12g/day of soya protein, mimicking the intake of non-vegetarian Japanese and Shanghai Chinese. However, vegetarians consume roughly half this amount.

Soya beans are the only legume containing high amounts of alpha-linolenic acid. Based on human nitrogen balance studies, soya is also the only plant containing high-quality proteins when measured against all plant protein sources fit for human consumption. According to a study by the National Centre for Biotechnology Information of America, the protein content of soya beans normally varies between 36 and 46%, depending on the cultivar.

There are several traditional and modern soya food options that are becoming more popular as veganism increases worldwide. Soya milk, edamame, tofu, soya cheese, miso, soya sauce, tempeh, nattō, sufu, yuba, soya flour, soya protein isolate, and meat analogues (also called textured

vegetable protein) are all popular choices for a healthy vegan lifestyle.

Rise of the ingredients market

Seeing as more consumers in developed countries are reducing their animal product intake and supporting more sustainable approaches to food production, vegan food companies have started zoning in on demand.

In 2016, the market for global plant protein ingredients was worth \$6,4 million and is expected to grow to \$12,7 million by 2027. Global plant protein ingredients are mostly derived from soya beans and wheat, but pea protein also shows some promise. However, for sunflower and rapeseed proteins to be directly utilised for food, certain technical barriers still need to be removed.

According to the global vegan food market industry forecast published on *Research and Markets*, the global vegan food market was valued at \$14,2 billion in 2018 and is expected to reach \$31,4 billion by 2026, registering a compound annual growth rate of 10,5% from 2019 to 2026.

Global soya bean production

According to the *OECD-FAO Agricultural Outlook 2018 - 2027* for oilseeds and oilseed products, soya bean production is anticipated to increase by 1,5% per annum compared to the 4,8% growth per annum over the last decade. Production of other oilseeds such as sunflower seed, groundnuts, and rapeseed are also expected to increase by 1,6% per annum compared to the 3,1% per annum during the last decade.

The United States (US) and Brazil are expected to see similar growth

in soya bean production over the next ten years. It is estimated that both countries will reach 130 million metric tons in 2027, with an annual growth rate of 1,2 and 1,3% for Brazil and the US, respectively. Production estimates for Argentina and Paraguay are set at 66 million metric tons and 12 million metric tons in 2027.

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The reduced policy support for the cultivation of certain cereals in China has hampered soya bean production growth over the past decade. However, as two of the most important oilseed producers in the world, China and the European Union's projected production in 2027 are 32 million metric tons and 30 million metric tons, respectively. Production expansion for both regions will likely be small throughout the next decade.

Soya bean production is set to flourish in some countries in sub-Saharan Africa. Similarly, the Ukraine and Russia will most likely expand their oilseed production by 4,3 and 2,2% per annum, respectively.

This global expansion in oilseed production will allow countries to meet the growing domestic consumption needs for vegetable oil. However, the global trend of gradually increasing oilseed production in the major producing countries and the predicted

decline of the stocks-to-use ratio could result in increased price volatility.

Local soya bean production

South Africa ranks 13th in the world in terms of soya bean production and is the third largest consumer internationally. According to the Department of Agriculture, Forestry and Fisheries, local soya bean consumption is estimated at 32% for oilcake and oil, 60% for animal feed, and only 8% for human consumption.

Over the years, fluctuations in soya bean production volumes have been attributed largely to the variability of areas allocated to soya bean crops and unfavourable weather conditions. Yields in South Africa average 1,7 to two tons per hectare under dryland conditions, with total yields ranging from 100 000 to 800 000 tons per annum.

Local demand for soya beans comes predominantly from the processing industry. Rising income levels and improved crushing capacity of processing facilities are the two largest drivers behind the rising demand for oil and meal.

In terms of human consumption, soya milk is one of the most valuable protein supplements in infant feeding. Mature fermented beans are used to make soya sauce while roasted seeds can be utilised as a coffee substitute. Soya flour is used in bakeries and as an additive or extender in cereal flour and meat products in certain health foods.

The myriad health benefits of soya beans have sparked a rising demand for soya-containing products both locally and abroad. The Bureau for Food and

Agricultural Policy (BFAP) estimated that one million hectares of soya beans will be planted per season in the next five to ten years in South Africa.

According to the South African Grain Information Service (Sagis), roughly 29 000 tons of soya beans are processed locally for human consumption on a five-year average. Yet more than half of the soya market for human consumption still relies on imports.

Statutory soya bean levy

With local demand for high-quality, nutritious soya food products growing, emphasis would need to be placed on new soya bean cultivars to satisfy this market. As an increasing number of consumers are demanding environmentally conscious products, South Africa would have to expand its range of non-GMO, high-yielding soya bean cultivars that can match the performance of GMO cultivars. Currently, up to 80% of soya beans planted in South Africa consists of GMO cultivars.

In March 2019, a statutory levy was introduced for soya beans, with producers subsequently having to pay R65/ton sold. Role-players in the oilseed industry, represented by the Sunflower and Soya Bean Forum, urged the ministry of Agriculture, Forestry and Fisheries to put this levy in place.

The South African Cultivar and Technology Agency (SACTA) collects the levy each month and distributes it among various seed companies. This serves as compensation for the companies' investment in the research and development of advanced seed

technology. The levy increased to R80/ton sold on 29 February this year.

In the long run, more advanced soya bean cultivars that are resistant to harsh climatic conditions and pests will see a decrease in the amount of soya products imported.

Catering for plant-based diets

According to Innova Market Insights, approximately 75% of health-conscious South Africans are opting to skip meat during meals at least once a week. More than a quarter of adults in the 25 to 34 age bracket identify as vegan in the US and up to 38% of Americans report that they enjoy meat-free meals once a week; this trend is even more apparent in Germany (69%) and Britain (53%).

The global fast-food market was valued at approximately \$617,6 billion in 2019, with a compound annual growth rate of 5,5% predicted from 2019 to 2025. Globally, McDonald's is still in the lead with a brand value worth \$130,4 billion. Starbucks and KFC are second and third, with a value of \$45,9 billion and \$17,2 billion, respectively. Veganism has hopped on board the fast-food train with top brands now offering meat-free options on their menus. McDonald's already have meat-free options available while Burger King and KFC are planning to trial vegan versions of crowd favourites.

The Beyond Meat burger, made from ingredients such as pea protein and beetroot, is now available in South Africa, while food retailers such as Checkers and Woolworths are widening the range of vegan products on offer to accommodate the shift in customers' habits towards a plant-based diet.

Fast-food outlets and food retailers that are expanding their vegan product range may be ahead of the curve when it comes to evolving consumer preferences. According to a report by global management consulting firm Kearney, an estimated 35% of all meat will be cultured in 2040 with 25% being replaced with vegan alternatives. 🌱

For enquiries or a list of references, send an email to the author at claudi@plaasmedia.co.za.

Figure 1: Oilseed production by region in million metric tons (Mt).
(Source: OECD-FAO, 2018)

