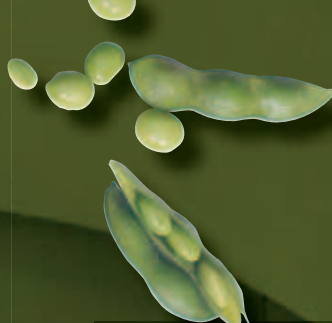




BY JOHN PLUMMER
PHOTOGRAPHS COURTESY OF ROQUETTE



Think of protein powder and most people think of animals. Whey from cows is by far the most popular product on the sports nutrition market and understandably so—it has helped generations of athletes and bodybuilders get results.

But animals aren't the only option. They currently account for a little more than two thirds of protein worldwide but the remaining 30 per cent is extracted from vegetables, and this figure is expected to increase in years to come.

Plant proteins already appeal to vegetarians who are opposed ethically to eating animal-sourced products. But they're likely to increase their appeal to non-vegetarian gym-goers who suffer intolerances and allergies to milk-based products, or who are impressed by the benefits plants provide to people and the planet.

We're not saying you should ditch whey and —far from it. They're safe, effective and, more often than not, taste great.



French yellow peas unloading at ROQUETTE Vic-sur-Aisne factory.

Just remember, they're not the only choice and that vegetable protein can provide another weapon in your arsenal to improve your physique as well as another taste sensation.

Yet despite the benefits, many people who train and take shakes know little about vegetable protein powder. They may have heard of soya, which is the most popular plant choice thus far. There is also hemp seed, brown rice and Brazil nut but in the last 10 years, another vegeta-

ble has appeared on the market—pea protein.

Peas are not the kind of food that has traditionally featured prominently in an athlete's diet. Sure, they're a tasty side dish but hardly a mainstay of a muscle-building diet. However, an increasing number of sports nutrition companies have started stocking pea protein blends alongside their more traditional product range.

We recently travelled to France to visit



Bottom part of the spray-drying unit





the control room at the heart of the factory

a company called Roquette, which is the largest producer of pea protein in the world, to find out why this is happening.

Roquette began as a small family firm in 1933 when two brothers began extracting starch from potatoes. Today, it specialises in the extraction of protein and starch based products from four raw ingredients—maize, wheat, potato and, most recently, pea to make ingredients for a huge range of foods, ranging from chewing gum to chocolate, and non-foods

like over the counter and prescription medications.

You may not have heard of Roquette because it sells to businesses rather than directly to consumers, but it is huge. Its head office and starch plant in Lestrem, Northern France, which we visited, extends across 150 hectares of French countryside. The company has several other factories around the world, in places such as Corby, England; Cassano Spinola, Italy; and Keokuk, Iowa in the

USA and employs over 6,000 people globally, including 300 researchers and technicians.

Roquette began extracting peas in 2003 and now processes 80,000 tonnes of pea protein a year, which it sells to various sports nutrition and health food companies.

WHAT'S SO GOOD ABOUT PEAS?

Peas are legumes, which are good sources of protein and fibre and low in fat. Pea protein is not made from green peas, which are probably the most popular variety eaten by westerners, but yellow peas, which are also known as split peas. Yellow peas are widely grown in Canada and China but Roquette uses crops harvested within 200 km of its French factory for its pea protein, which is called Nutralys® pea protein. France is also among the leading countries producing yellow pea (leader in EU).

HOW ARE PEAS TURNED INTO PROTEIN POWDER?

The peas are cleaned and ground into flour, which is then separated with water into various components, including protein. The protein then coagulates into a paste before being solubilised again and spray-dried and granulated to ensure easy

blending. No chemical solvents are used during the extraction process, only water.

BENEFITS OF PEA PROTEIN HIGH PROTEIN CONTENT

Containing 85 per cent protein, pea protein is richer in this vital muscle-building ingredient than other vegetable proteins. Pea protein also contains an excellent profile of essential and non-essential amino acids. It is a particularly good source of arginine, containing 8.7% arginine per gram of protein, which is higher than any other protein source including soya (7.6%), egg whites (5.1%), casein (3.8%) and whey (2.3%). Arginine plays a major role in muscle building because it helps to release growth hormone, is involved in the synthesis of creatine and is used to make nitric oxide.

Pea protein is also high in the essential amino acids lysine and non-essential amino acid glutamine. The benefits of pea protein can be enhanced when it is combined with other vegetable proteins such as rice and wheat protein because the products have complementary amino acid profiles. Rice and wheat are a good source of amino acids cysteine and methionine, but not lysine.

Some people have been unwilling to use vegetable protein powders because they generally contain less protein than animal powders but this is much less of an issue with peas. Marie-Hélène Saniez-Degrave, corporate nutrition director at Roquette, says the concentration of essential amino acids and conditionally essential amino acids, particularly arginine, is one of the main reasons people are switching to pea protein. "It is really good for sports people and for healing," she says.

EASILY DIGESTIBLE AND SUITABLE FOR PEOPLE WITH INTOLERANCES AND ALLERGIES

Pea protein is free from lactose and gluten so it is great for people who suffer from these common food intolerances. Highly digestible proteins are a good indicator of the bioavailability of amino acids. In other words, if you can't digest it, you don't get the nutritional benefit. Pea Protein is easily digestible and contains no major allergens.



Laboratory for analytical and microbiological quality controls.



Pea protein packaging unit



OTHER HEALTH BENEFITS

Long-term over-reliance on large quantities of animal proteins may increase cholesterol levels and the possible risk of heart disease. Vegetable foods are low in saturated fat and cholesterol and a good source of unsaturated fat, fibre, vitamins and minerals. Yellow peas used for pea protein are also low in phytosteroids, (conversely to soybean), which minimises possible oestrogenic effects.

SPEED OF RELEASE

Pea protein is digested slower than whey protein but faster than casein. Its intermediate speed of digestion provides another option when deciding how quickly you want to feed your muscles.

PRICE

Peas have not been subject to all of the commercial pressures that have driven up the price of whey in recent years. Although prices vary according to brands, pea protein generally costs less than animal protein.

SUSTAINABILITY

Environmental factors are increasingly influencing consumer behaviour. As an example, the land requirements for the production of animal proteins are five times greater than for plant-based proteins, which makes it a more sustainable product. Animal farming can also contribute to deforestation. Pea is a legume, and as such is able to utilise nitrogen for growth.



Sensory laboratory - ROQUETTE employees are involved in pea protein tasting panel

Therefore, it does not require harmful nitrogen fertilisers. The fact that Roquette sources peas from within 200 km of its factory also reduces also its carbon footprint. Generally speaking, the carbon footprint of plant protein production is significantly lower than animal protein.

GM-FREE

The European Union has not authorised the production of genetically modified crops including peas, so pea protein is free from the concerns some people may have about genetically modified foods.

Marie-Hélène says its pea protein, which is available in bars, drinks, tablets and even white cheddar puffs, has a good all-round nutritional profile. "Pea protein has an outstanding well-balanced amino acid profile compared to other vegetable proteins," she says. "There are no metabolic chronic disorders associated with this product. More and more people suffer from

intolerances. Pea protein is not on an allergen list."

Audrey Taffin, global market development manager at Roquette, stresses that the company is not in any way opposed to animal protein. "We want to build up synergies between the products," she says. Nevertheless, she predicts that pea protein will become more popular as more people start to take an interest in how their products are sourced. "It is not that big a market yet but we definitely expect it to grow," she says.

Audrey says that besides Europe, the United States and Canada are the main market for pea protein so far, with Oceania and India also catching on. The pea story, it seems, has just begun. **M&F**

For more information on Roquette's pea protein, please visit their website at www.pea-protein.com

For other articles in the *How Supplements are Made* series, please see our story on Glanbia (Good Manufacturing Practices, Quality Control) www.muscle-fitness.co.uk/glanbia, Reflex Nutrition (product development and more on GMP and QC in their own factory) www.muscle-fitness.co.uk/reflex and HFL Supplement Testing (one of the world's premier independent banned substance testing laboratories) www.muscle-fitness.co.uk/hfl



Central Application Laboratory - a dedicated team is evaluating end-product prototypes, made from Nutralys® pea protein, designed for promotional purposes.

Nutralys® pea protein powder.



MARKETING PEA PROTEIN

REFLEX NUTRITION

In conjunction with this story, we also had the privilege of recently visiting Reflex Nutrition's brand new custom-built factory in Woodingdean, near Brighton. Reflex is one of only a few UK brands who manufacture all of their own products (as opposed to using a contract manufacturer like Glanbia). Their new factory is an amazing facility, using the entire latest energy saving/carbon footprint reducing technology in their manufacturing and they even generate most of their own power through solar and wind. With all of their high-tech, eco-friendly machinery and processes, it's not surprising to learn that they are launching an environmentally conscious protein powder.

We asked the MD of Reflex Nutrition, James Phillips, why their new vegan product uses pea protein and no other vegetarian sources. "There are a number of reasons, first and foremost we chose pea protein because we're making this product specifically for athletes. Satisfying their needs means using a vegetable protein that supplies the highest content of BCAAs and the highest content of arginine. The solution is pea protein, not soy, not rice, not hemp, nor any so-called magic combination. Vegans and vegetarians are already committed to regimented diets that supply a wide and varied source of vegetable proteins, so the focus from a sports performance perspective is a protein that triggers growth that comes from BCAAs. In much the same way that athletes consume whey protein for its high BCAA content (approximately 24%), vegetarians and vegans can get a similar benefit from pea with its 18% BCAA content. Couple this with its very high levels of arginine (over 8%) and you have an excellent protein for both vegans and those who eat meat."

James continues, "we are also wanting to use a protein that isn't associated with any negative effects for athletes, a vegetable protein that is environmentally sound and one that is also classed as hypo-allergenic. Again, pea protein fits the bill perfectly."

"Our finished product called Vegan Protein is also sweetened naturally with stevia and comes in a unique range of flavours that suit the sweeteners natural flavour profile. The combined flavour profile of pea and stevia is bitter sweet and so suited to a range of very particular flavours which includes flavours such as raspberry rather than vanilla for instance."

SCI-MX NUTRITION

was one of the first companies in the UK to stock a protein product which contains pea protein as one of its ingredients. Its PRO-VX Protein powder, which uses protein concentrates and isolates from pea, soya and brown rice is, according to the company's literature, "designed to be superior for muscle building to any animal-sourced protein available" because of its high levels of BCAAs and arginine.

That's quite a claim but Tim Hyman, managing director of Sci-MX, says many of its staff have personally switched to PRO-VX protein. "Whey protein has been a runaway train in terms of its popularity," says Tim. "There is a perception that if you want big muscles eat cows, or drink the milk of cows. Whey will never go away but non-dairy will play a bigger and bigger role." Tim says the high protein content of peas and its amino acid profile are strong factors in its favour. "Pro-VX benefits from the high percentage of BCCAs in pea protein, but is also high in arginine due to its overall combination of protein sources," he says.

Vegetable proteins have sometimes compared unfavourably on taste to animal ones. "We were initially worried about the flavour but it has been extremely well received," says Tim, who told us that PRO-VX has a "nutty background flavour" that complements its vanilla, chocolate and strawberry options.

Tim explained that the rising price of whey is another factor in pea's favour, as are environmental and animal welfare concerns relating to animals. "Customers are increasingly thinking about these kinds of things," he added.

He continued by telling us that high cholesterol is a surprisingly common problem among people who weight train, which could be because of dairy. "It's very sensible to think about cholesterol," says Tim. "Whey will always be a big part of the market but I'm sure pea protein is going to play a bigger and bigger part among protein powders."

We asked the following question to both Tim at Sci-Mx and James at Reflex, "So we call up Sci-Mx or Reflex and ask, 'what's your best protein powder?'" and they both said that their customer service teams would start asking questions about what the caller eats on a whole-food basis, if he or she has an allergies, etc. They both said that barring any allergen or budgetary problems, their customer service teams would still recommend whey, or in the case of Sci-MX its GRS-5 gradual release blend first. However, if the customer calls up and is looking for a "non-dairy protein", either PRO-VX or in Reflex's case, an egg white-based protein would be recommended. Both also agreed that if a customer called up and was looking for the "least expensive" protein, they would be steered towards the pea/rice/soy blend. Ultimately, it's about offering the customer choice of ingredients and a choice of price points to meet their physique and performance goals.