



# *in* 'Beans ~~on~~ toast'

## Can Britain raise the pulse?

by James Cooper, Milling and Grain contributor, UK

**E**veryone knows that Beans-on-Toast are nothing short of culinary perfection, but beans in toast.

As a child I absolutely loathed them. Not the sugary ones in tomato sauce, but the bitter green type that came in fury pods; the dreaded ... broad beans. My mum's vegetable plot yielded buckets of the things and they were frequently presented to me as essential fodder: they were 'good for me.'

The baby ones drenched in butter were manageable but the large mature ones - complete with their arid, bitter mouthfeel - for a child they are practically inedible. An acquired taste though, and one I acquired in later life, in fact now I love them. But the reality is most people in the UK at least, don't eat or even particularly like them.

Yet here we have a crop perfect for our UK temperate climate, packed with nutrition (it counts as one of our 5-a-day) and as a bonus, organically fixes nitrogen in the soil for free. It's a win-win crop, yet one that at present we mainly export or feed to animals. What a waste!

If only we could adjust our taste buds to like them, or perhaps more to the point, learn how to cook and eat them.

"The fava beans had a bit of an identity crisis," says James Maguire, President of Pulses UK, the trade body which seeks to communicate the value of pulses in crop rotation, while helping its members cash-in on a steadily increasing demand for

domestically produced protein.

"What is a legume? How do you grow them? How do you use them at home and cook with them?"

"I think there's a huge education piece that needs to be done at the consumer level," he says, identifying this as the real issue.

World Pulses Day - February 10th - has just passed, but there's a lot more work to be done in getting the consumer to understand the value of this remarkable bean.

"Global supply and trade flows are well established; pulses are there in the market. And, what's lacking now is education of the consumer, they're just not in most diets.

"Whether they are beans, chickpeas, or lentils, there's an education piece needed. Most people don't know how to use them, or probably even the health benefits."

It wasn't always the way - we used to eat lots of them - but the haricot bean took over with the popularity of baked beans, and today most fava beans are exported to North Africa.

And apparently, it's not only humans who don't like the bitter taste.

"There's also an emerging market in aquaculture where they are de-skinned for fish feed," James Maguire proffers.

### Health by stealth

However, things are changing. Plant protein is seen by younger generations as an important component of their diet.

Recent Mintel research shows that Generation Z, those under 25 who probably cannot remember the stigmatisation of beans as 'food for the poor', consume far more plant-based protein for



environmental and health reasons.

And with over 50 percent of global consumers now identifying as flexitarian, there is a clear shift towards alternative protein sources.

Governments are also becoming more acutely aware, for food security reasons, that homegrown crops are a safer bet. There is a big push towards incorporating more plant-based protein into our diets across all age ranges and in particular how to get older generations and those of disadvantaged demographic, or living in 'food deserts,' to eat more protein crops.

Therefore, sneaking pulses into bread where the taste can be designed and disguised is, perhaps, quite a good way of getting consumers to eat more.

### Finding the pulse

Researchers in the UK are now working with the British Nutrition Foundation (BNF) to shift people's negative perception of beans and pulses.

The research project aims to encourage British consumers to eat more broad beans and is backed by UK£2m of government funding as part of a wider programme, the UK£47.5m Strategic Priorities Fund (SPF), to make UK food systems healthier and more sustainable.

The programme aims to fundamentally transform the UK food system, addressing questions around what we should eat, produce, and manufacture, and crucially - the Achilles heel of any food system - what we should or shouldn't import.

Professor Julie Lovegrove is Head of the Hugh Sinclair Unit of

Human Nutrition at the University of Reading and sits on several government advisory committees including the UK's Scientific Advisory Committee for Nutrition.

Leading the BNF research, Professor Lovegrove said fava beans could appeal to UK consumers as "Beans in Toast", improving the nutritional quality of bread while making it less damaging to the environment.

"We had to think laterally: what do most people eat and how can we improve their nutrition without them having to change their diets? The obvious answer is bread," she said.

But the idea of putting broad beans, or fava beans as they are more commonly known, in bread to complement wheat might not have appeal when you consider the old saying: 'If it ain't broke don't fix it.'

The main aim of the project is to increase the consumption of pulses within the UK population's diet. Pulses are important components of our diet; they're classed as fruit and vegetables. They have high nutrient composition, including high fibre and micronutrients such as iron, which are often low in the population's diet. They also have high protein faculty.

"Fava beans are a particular example we're going to concentrate on and we're looking at these because they're particularly nutrient dense and they can be sustainably grown, and affordably in the UK," Professor Lovegrove went on to explain.

### Changing farts and minds

"We're going to change people's diets by not only encouraging them to consume these as vegetables in the fresh form, but

particularly to replace nutrient-poor wheat flour in our staple food, bread, with nutrient-rich fava bean flour.

“We know that certain groups of the population find it more challenging to change their diet,” she adds.

If successful, this ‘health by stealth’ approach will improve people's diet without them having to dramatically change what they eat. The obvious choice in relation to pulses is, of course, our staple - bread.

“As a nutritionist I’d like everyone to have whole wheat bread, but they don’t, and 90 percent of the bread purchased is white bread. So that’s why we chose white bread which, as a food, isn’t that nutrient dense - it has got high glycaemic index which means that it increases blood sugar to a greater extent than other foods - and it also uses imported soy and wheat, and of course we’re trying to increase the sustainability of our diet and eat more homegrown foods.

“We can not only grow the fava beans here, but also produce and test the fava bean-rich bread, with improved nutritional quality.”

There are hurdles in the project.

The main reason bread is made from wheat flour is because it contains gluten, an essential requirement for creating the crumb and dough structures that we are used to.

But pulses can be used to replace the imported soy which is used as an improver in white bread made using the Chorley-Wood method (the method predominantly used to make white bread).

Although only four months into the three-year study, early results are promising.

“When we have about a 25 percent substitution of white flour with fava bean flour, and the three percent soy, we found that it looks and tastes very good.

“It doesn’t rise quite as much as wheat flour, mainly probably because of the gluten, also the colour is slightly darker, it has a slightly different taste. So those are the challenges that we will be facing.”

Key to the success of the project will be creating something indistinguishable from what’s already in shopping baskets, but with the added benefits. Unlike fortification of flour with folic acid for neural tube defects, which has taken 21 years to achieve, its unlikely to go to policy.

“We know it can be done - we’d like to increase the fava bean substitution to a greater extent because we know that will increase nutrient composition and then the beneficial impact on the environment, but obviously we need to get over the challenges in actually making the bread so it looks identical so that people will eat it in exchange for their normal commercial white bread.”

As for the bitterness, it seems removing the husks of the bean removes the main source and preliminary testing of bread has been quite positive.

It would also, perhaps, be disingenuous not to mention one commonly known side effect of consuming beans – flatulence - the associated gas produced in our gut and the main culprit, the sugars in beans called raffinose.

Because the human digestive tract can lack an enzyme called alpha-galactosidase to break down raffinose, it travels undigested to the large intestine. That’s where bacteria feed on the sugars fermented in the gut, which can produce gas.

To put it simply, fermentation equals farting. Might that be off-putting for consumers?

“Yeah, really good point.

“We haven’t looked into that yet”, Professor Lovegrove concedes.

“When beans are processed into flour, that may have a reducing impact on the amount of flatulence produced, but that’s something of interest we’ll certainly look at.”

Gassing aside, there are a couple of more serious potential drawbacks the scientists must first address: one, that the level of acrylamide, a carcinogen, is not too high; and the other that it is edible for people with favism, a genetic disease which can cause a severe reaction to fava beans.



## Milling considerations

Are pulses a crop the miller can easily adapt to? I asked James Maguire.

“If they are milling cereals, then probably not. They require quite a different infrastructure.

“In terms of either conveyors, elevators - the practical ways of getting it from a lorry to a mill - you tend to find the plants that handle the pulses have a very different set up. There probably needs to be some changes.

However, small scale millers who are probably not doing the volumes, and can tweak their machinery, they’ll probably be the ones to start it. Pulses are a still a bit specialist to mill at the moment,” James concedes.

But apart from anything else, fava beans are plentiful cheap and the market this year is especially quiet.

“The Australian crop has just been harvested, and that’s one of the defining moments in the UK market,” he explains.

“If it’s a good crop in Australia, then the UK market cools off pretty quickly in terms of exports; if they have a terrible crop then, historically, we get those competing markets [Australians] normally get in North Africa.

## Bumper crop

“And their crop has been the largest it has ever been, about 700,000 tonnes of beans were harvested. And so they’ve just been happy to ship at almost any price, which pulled back the value of the beans in the UK.”

Is the BNF project is something to get excited about in the larger scheme of things - is the pulse industry at large quite optimistic about bread innovation?

“Yes, definitely. These emerging markets are the most exciting

thing in UK Pulses at present. In the UK, I think bean crops will probably be somewhat upbeat year-on-year. Right now, they seem to be a favoured break crop for farmers, due to problems with oilseed rape, so we’re always going to have supply which is positive.

“Domestic markets for feed are always there, but it’s going to be about the emerging markets where we’ll start to see them put into crisps, flours, protein formula, stuff like this. This is the future of it.

“I was with one of the UK’s biggest bakers last week and they are they’re incorporating pea and bean flour into wheat at this very moment.”

So as the UK looks down the barrel of looming recession, with sales of simple white bread shooting up 13 percent in the past year, fava bread certainly has the potential to make a meaningful impact on the health of the UK population at a time needed most. Essential fodder indeed.



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