Opportunities with High Value Pulses Ingredients

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Think about a retail shopping experience 20 years ago. Now, compare it with the experience in a supermarket today. So much variety, so many alternatives – every day, new choices!

It really is impressive to see how many different product options are packed on every shelf. In less than one generation, the food industry has rapidly adapted to ever more challenging consumer wishes.

Today, every category of consumer is very precisely catered for with an impressively broad palette of novel product. The creativity, innovation and speed with which the industry has achieved this is certainly deserving of some recognition.

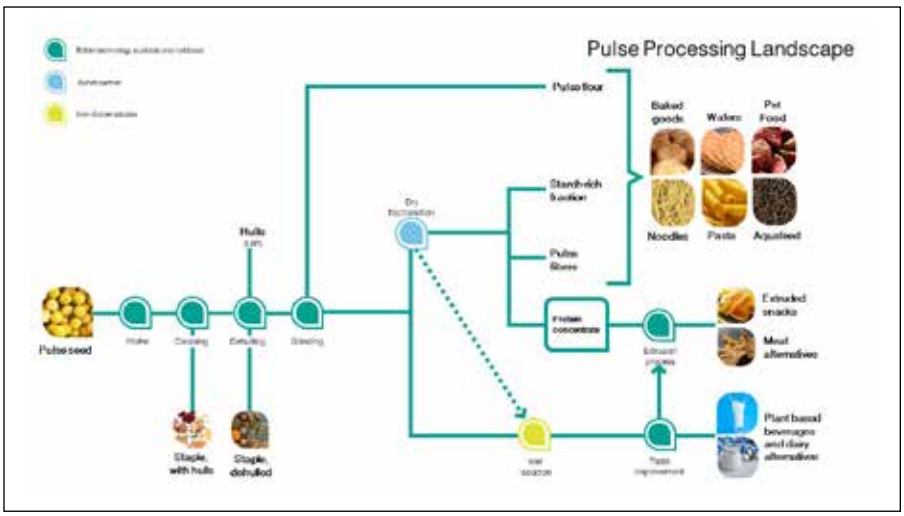
Now, what next? Today's consumer continues to be focused on the functionality of food, looking increasingly for products with health and wellness claims – and is willing to pay 25 percent more for baked goods, over 60 percent more for pasta and over 45 percent more for snacks that satisfy this need.

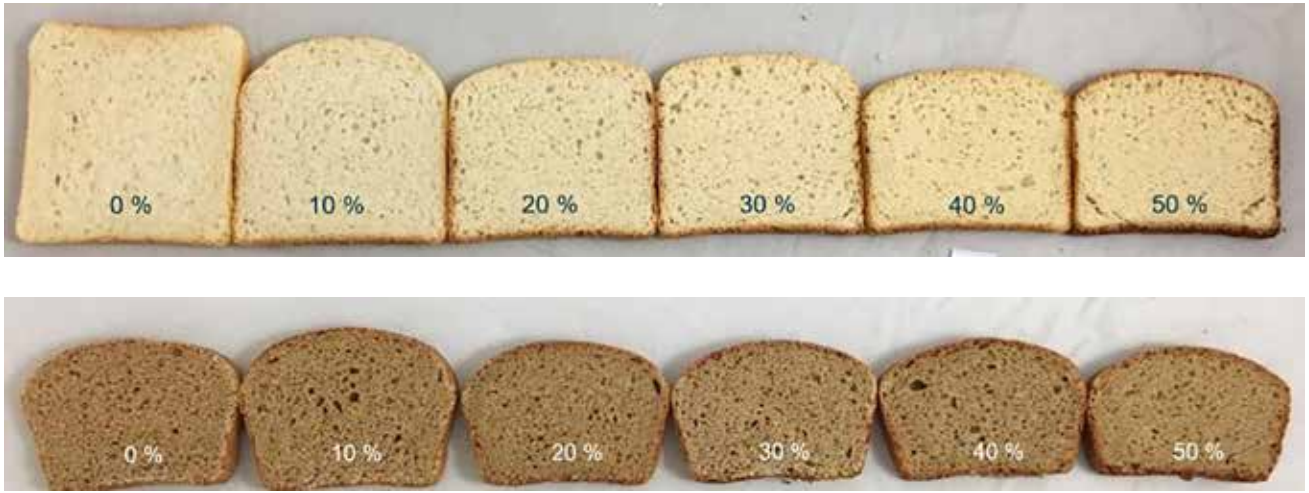
In parallel, as today's consumers are far more conscious of sustainability, plant-based foods and beverages are booming, with forecasted global average annual growth rates above 12 percent for plant-based meat categories and above six percent for plant-based beverage categories.

Pulses have great potential

In responding to these trends, pulses have a great potential as promising next generation ingredients. Beans, peas, lentils and chickpeas are very healthy and environmentally friendly. With global production of more than 80 million tons a year, pulses are readily available and therefore are destined to play an even more prominent role in future food formulations.

In the last decades, Bühler has been steadily investing in R&D to offer sustainable pulses process technologies along the complete value chain: from the bean, pea, chickpea or lentil to





ready-to-eat delicious products. Bühler offers holistic process concepts, particularly in the field of protein extraction and its implementation in value-add foods.

However, what are the possibilities to turn pulses into ingredients? Let's take a closer look at the pulses processing landscape.

Flawless cleaning of the pulses seed is mandatory, whilst dehulling is also a key preparation step before processing the pulses into ingredients. After the dehulling step, there are three further processing options.

The first of these options involves the grinding of the pulses directly into flour, which is then used to make traditional local foods or to add value to bakery, snacks and pasta products, making them richer in protein and fibre than those made with more common flours such as wheat and corn.

The second option is to convert pulses into ingredients is through the integration of fine grinding and air classification steps, a process known as fractionation. This process delivers pulses concentrates, with protein content of up to 60 percent (depending on the raw material).

Concentrates have a higher value and a bigger field of application than pulses flours. Besides their use to add value to snacks and baked goods through higher protein claims, pulses concentrates have great potential in pet food and animal feed applications, as well as in the plant-based meat substitute field. For dry meat analogues in particular, such as minced meat for hamburgers or chili con carne, pulses concentrates can

successfully be applied as the main raw material.

The third option is to process the pulses into protein isolates using a wet process that includes several steps of solubilisation and centrifugation. Pulses isolates have a protein content between 80-90 percent and are the highest in value (up to two times the price per ton of concentrates). Today, the main application of isolates is in the categories of sports and muscle-building foods and beverages, protein bars and plant-based meat and dairy substitutes.

The choice between pulses flours, concentrates or isolates depends not only on the target application but also on consumer needs and their willingness to pay. Overall, the three ingredient types can be considered as functional ingredients and their application has much potential in the global food industry.

For example, there is great potential to innovate with pulses flours in mixes with other cereal flours to make healthy snacks and bakery products that are higher in fibre and protein. Moreover, the potential to implement pulses (protein) concentrates in the field of animal and aqua feed is yet to be fully exploited.

However, the use of concentrates in the rapidly growing field of plant-based meat substitute and beverages appears to be the area with the biggest potential. Today, most of the products in these fields are made using high-value protein isolates. The use of pulses concentrates combined with the right technology set-up can potentially deliver promising plant-based products with good palatability and taste ratings.

As the demand for healthy and sustainable foods is increasing, the pace of R&D in this area needs to accelerate. This is why Bühler has been investing heavily in its Food Application Centers, which aim to offer customers deep processing expertise and full, pilot-scale infrastructure for product innovation and business case testing.

Bühler offers a truly global network

In the field of pulses, Bühler offers a global network of application facilities that have the capability to convert pulses into ingredients, whilst also following the value-addition chain with technology in bakery, snacks, pasta and extrusion for plant-based meat substitutes and beverages.

In addition, with a sustainability commitment at its core, Bühler has also been investing in R&D activities related to side-stream valorisation. For the specific field of pulses processes for high protein ingredients (concentration or isolation), the application of the resulting pulses starch represents a challenge as, at first glance, it seems not to be as competitive as traditional starches such as those of wheat, corn or potatoes.

For this reason, Bühler has recently carried out a number of different trials with pulses starches and their application in bakery, snacks, crackers and wafers - either solely or in combination with cereal flours for value-add products. The results have been very positive and reveal that pulses starches could, in future, be a valuable ingredient in the food industry.

Finally, the use of all types of pulses ingredients in food and feed has great potential. Solely or in mixes with other cereal ingredients, the key will be to find the right proportions to satisfy local consumer preferences – especially in terms of taste.

As the space for innovation and product development is still wide open, we can be sure that processing pulses into ingredients will play an important role, ensuring the dynamism, variety and excitement in the shopping experience is maintained for years and decades to come.