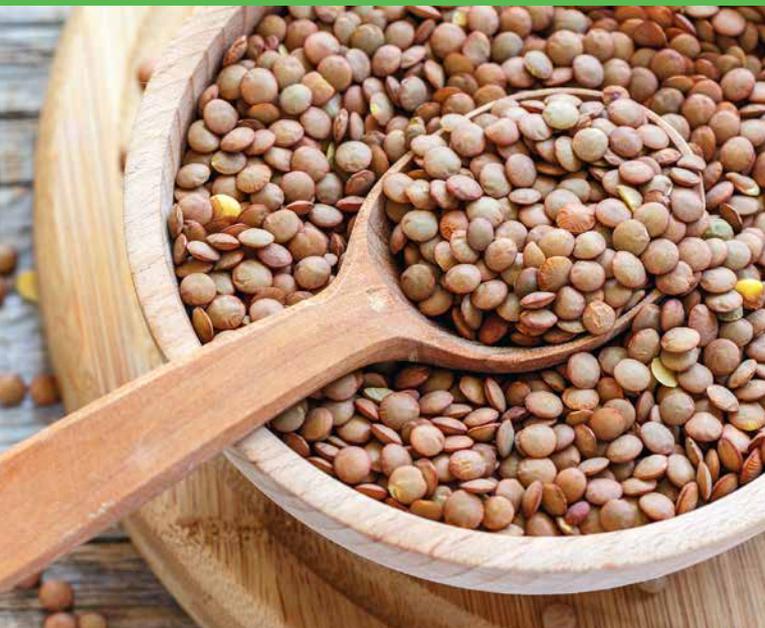




The Esca Bona™ Ingredient Trend Series

# Pulses

CHICKPEAS, LENTILS & PEAS



# Pulses: Putting Plant-Based Innovation Center Stage

by Judie Bizzozero



Vegan, vegetarian, flexitarian, meatless Mondays—all terms that were nonexistent or at least relatively obscure to most Americans, whether one, five, 10 or 20 years ago. Consumer perception of what constitutes a good protein source is expanding to include a wider variety of plant-based protein ingredients that offer a balanced source of protein, while catering to dietary and lifestyle restrictions. These ingredients also satisfy consumer demand for clean labels and align with values related to sustainability and eco-consciousness.

According to Innova Market Insights, plant-based product claims increased by 62 percent compound annual growth rate (CAGR) globally between 2013 and 2017 with growth occurring on platforms such as plant proteins, active botanicals, sweeteners, herbs and seasonings and coloring foodstuffs. Innova also found increased use of plants such as vegetables, pulses and grains in the meat substitutes market, where global sales are set to grow to US\$4.2 billion by 2022. New product development (NPD) in the niche saw 11 percent CAGR for the 2013-2017 period, and four in 10 U.S. consumers increased their consumption of meat substitutes/alternatives during 2017.

Need more proof plant-based eating is here to stay? A recent study conducted by Nielsen and commissioned by the Plant Based Foods Association found sales of plant-based foods grew by 20 percent in the 52 weeks ending June 16, 2018, reaching a total of \$3.3 billion. With total food sales growing at just 2 percent, the data depicts a picture in which plant-based products are no longer a niche market.

Plant-based milk continues to be a leading category, representing \$1.6 billion at 9 percent growth—up 3 percent from the previous year. The meat alternative category, which excludes tofu and tempeh, grew an impressive 24 percent to \$670 million. With major advances in flavor and mouthfeel, plant-based yogurts, though still a smaller subcategory, have seen mighty growth, topping 12.7 percent over two years, according to the association.

Plant-based foods also received key recognition with the release of the 2015-2020 Dietary Guidelines for Americans (DGAs) that identified a healthy dietary pattern as higher in vegetables, fruits, whole grains, low- or non-fat dairy, seafood, legumes and nuts; moderate in alcohol (among adults); lower in red and processed meat; and low in sugar-sweetened foods and drinks and refined grains.

This demand is seen across nearly every food and beverage category, and brands are responding by delivering innovative products made with plant-based ingredients, particularly pulses, which are gaining more traction toward center plate.

### THE POWER OF PULSES

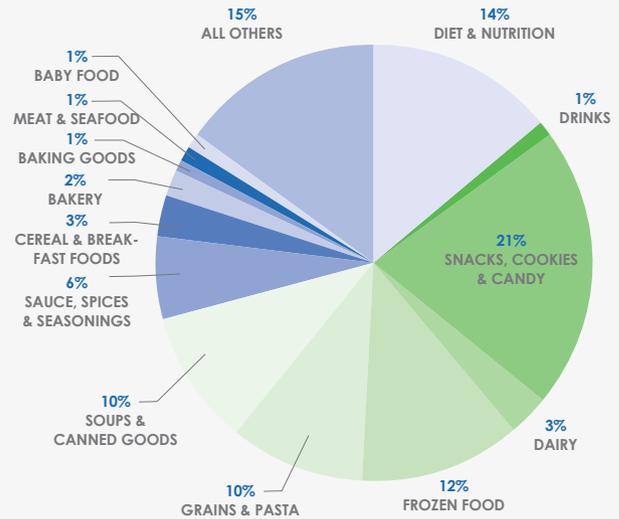
Interest in pulses, a subgroup of legumes that are harvested for the dry seed, grabbed global spotlight when the United Nations declared 2016 as “the International Year of Pulses,” using the slogan “nutritious seeds for a sustainable future” to raise awareness of the many benefits of pulses, boost their production and trade, and encourage new and smarter uses throughout the food chain. Pulses, including all kinds of dried beans and peas, are an inexpensive and highly nutritious source of protein and vital micronutrients that can greatly benefit people’s health and livelihoods, particularly in developing countries because they contribute significantly in addressing hunger, food security, malnutrition, environmental challenges and human health.

Micronutrient malnutrition affects more than 2 billion people. Among the most essential micronutrients are vitamin A, iron, zinc, iodine vitamin D and omega-3s. In fact, 17.3 percent of people do not take in adequate amounts of zinc, and 33.3 percent of children and 15.3 percent of pregnant women are deficient in vitamin A, according to statistics from Natural Products INSIDER’s digital magazine “[A World Without Hidden Hunger.](#)”

Inherently non-GMO (genetically modified organism), pulses are packed with amino acids, B vitamins and minerals and have a low-glycemic index. They also contain high levels of soluble and insoluble dietary fibers and starches, including resistant starches, that provide functional properties in food products. Low in fat and rich in nutrients and soluble fiber, pulses are also excellent for managing cholesterol

### Represented in 4,551 products, the following categories have the highest incidence of products formulating with pulses.

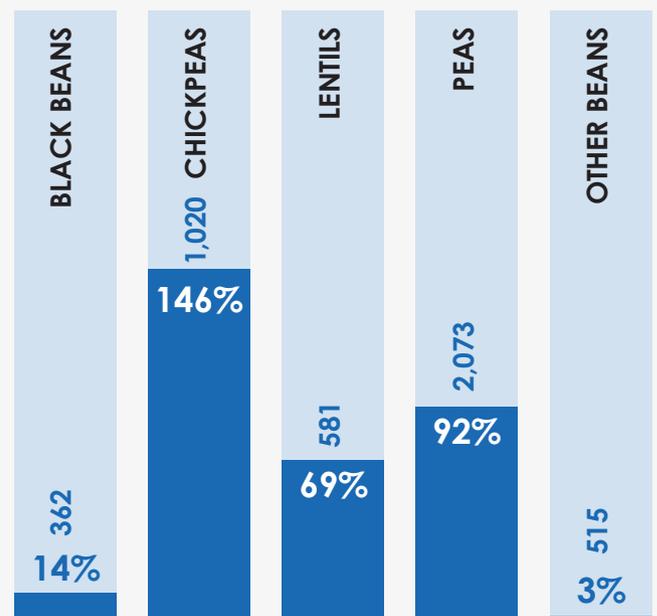
Expo West 2013—Expo West 2017



Source: New Hope Network NEXT Trend Database

### Pulses Usage Continues to Grow Among Products Launched at Expo West

Pulses with highest share of incidence in products across all Expos and demonstrating strongest growth from Expo West 2013 to Expos West 2017.



Source: New Hope Network NEXT Trend Database

and digestive health, and their high iron and zinc content makes them a potent food for combating anemia in women and children. They are a key ingredient in healthy diets to address obesity and to prevent and manage chronic diseases such as diabetes, coronary conditions and cancer.

### INGREDIENT SELECTION & SOURCING

Ingredient suppliers offer a variety of highly specific pulse ingredients including whole, roasted, flakes, flours, pastes, protein concentrates, protein isolates, starches, fiber and pulse/cereal blends. These versatile ingredients can serve as alternatives to allergen-causing ingredients, including milk, eggs, tree nuts, peanuts, wheat and soybean.

Of the hundreds of varieties of pulses grown throughout the world, some of the most notable include pinto, kidney, lima, navy and butter beans, lentils and chickpeas. They’ve gained popularity because they align with the growing segment of consumers who value health, sustainability and are vegetable-forward eaters. These plant-based proteins also are an affordable alternative to more expensive animal-based protein. Because pulses yield two to three times higher prices than cereals, they also offer great potential to

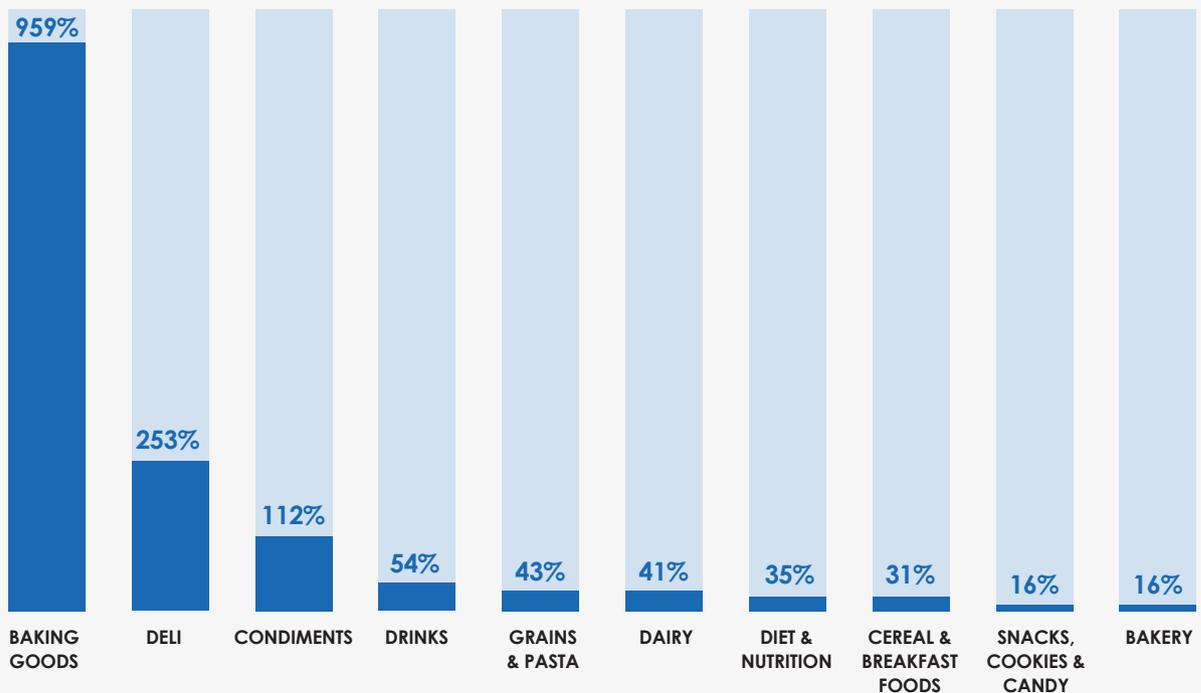
lift farmers out of rural poverty, and processing provides additional economic opportunities, especially for women.

According to a review published in the journal *Foods* (2017;6(7):53), a key reason for an increase in demand for plant-based protein is due to favorable comparisons with meat-based proteins. Plant-based protein is preferred to animal-based protein from an environmental perspective as it is associated with a lower land use requirement, and it is generally accepted that plant-based foods produce lower levels of greenhouse gases (GHG), which are associated with climate change, than animal-based foods. According to the authors, some plants offer unique advantages, e.g., pulses, being legumes, have the unique ability to fix nitrogen. Furthermore, due to the high cost and limited availability of animal proteins in several countries and consumer concerns over health benefits of animal-based proteins, increased attention has focused on the utilization of plant-based proteins as potential sources of low-cost dietary proteins for food use.

Advances in production technologies, including technologies such as advanced monitoring systems (e.g., biomass monitoring and harvest monitoring) and remote sensing, and biological innovations in genomics and plant breeding will improve input efficiencies and help to anticipate and mitigate production risks such as weather and pest related risks. New models of production are also emerging

### Leading Categories Innovating with Pulses

(growth of number of new products)



Source: New Hope Network NEXT Trend Database

including soil-less growing and indoor farming. Production costs and energy requirements mean that such systems are currently confined to high value protected crops, such as salad crops, rather than field grown crops, with limited relevance for protein production currently. However, overall, in the foreseeable future, technological development will continue to position plant-based protein as a desirable option from a sustainability perspective.

Finding established supply chains that are transparent and speak to socially and agriculturally responsible practices can be difficult when it comes to any ingredient, but forward-thinking brands are taking an active part in securing the future of the supply chain at the source. While supply chain issues with pulses are relatively few—availability due to greater demand, consistent quality, etc.—brands should work with their suppliers to determine any issues with formulation, costs, stability of supply for scaling up, etc.

### PULSES TO WATCH

Plant-based ingredients are gaining considerable traction because they resonate with health-minded consumers including vegans, vegetarians, flexitarians and those looking for clean label food and beverage choices. The pulses highlighted in this Report—chickpeas, lentils and peas—are all gaining interest as go-to ingredients across many food and beverage categories.

The Snacks, Cookies & Candy category showed consistent product innovation with pulses at Natural Products Expos from 2013 to 2017. The category showed a 21 percent increase in in product growth usage during those years. The Diet & Nutrition category also witnessed new products launches, clocking 14 percent growth during the same period.

#### Chickpeas

Chickpea (*Cicer arietinum*), also known as Bengal gram or Chana in India, is one of the major pulses cultivated and consumed in India. It is one of the oldest, most important and ubiquitous sources of protein for the people of India. After dry beans and peas, chickpea is the third most important pulse crop grown in the world, accounting for around 20 percent of the world's pulse production, according to the National Council of Applied Economic Research, New Delhi.

## [Chickpeas]

### BY THE NUMBERS

At nearly 300 products at Expo West 2017, chickpea opportunities lie in the Grains & Pasta, Frozen Food and Cereal & Breakfast Foods with increased innovation in the Frozen Dinner and Frozen Appetizers & Hors d'oeuvres subcategories.

#### Categories Innovating with Chickpeas

(absolute product count change)

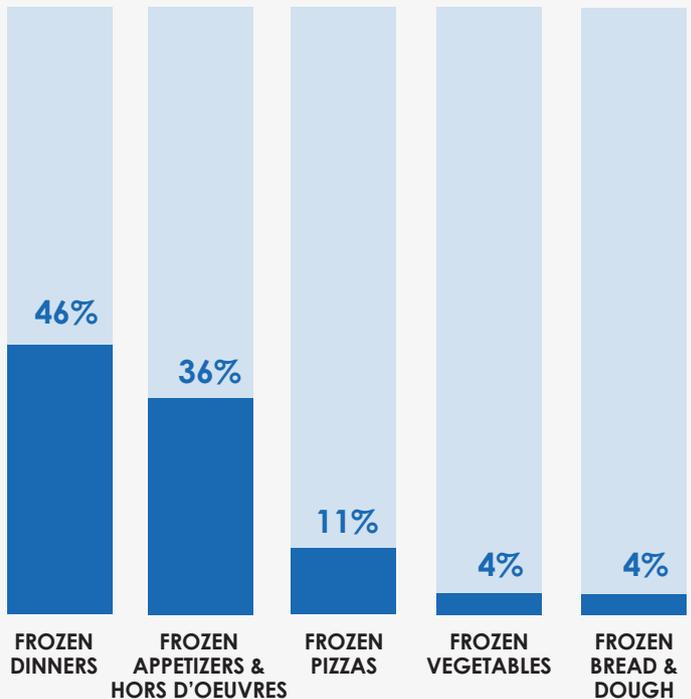
Expo West 2014—Expo West 2017



#### Subcategories Innovating with Chickpeas

(growth of the number of new products)

Expo West 2017



India is the world's largest producer as well as consumer of chickpea. The country produces around 8 million metric tons of chickpea annually, which contributes to nearly 70 percent of the world's chickpea production.

The chickpea supply chain's impact on the environment is very much in line with any farming activity and is quite environmentally friendly compared to other crops. *Ascochyta* blight, caused by the fungus *Ascochyta rabiei*, is the most significant challenge in the production of chickpeas in the Northern Plains and around the world. Growers in the past have experienced complete yield loss. Damping off and root rots of pulses are a disease complex caused by several species of fungi. However, chickpea has a natural resistance to insects due to the hairy nature of the plant's leaves, stems and pods. The plant excretes malic acid from these hairs, leaving the crop unattractive to most insects. Worldwide the insect that causes the most economic damage in chickpea is the corn ear worm (*Helicoverpa armigera*).

Native to the Mediterranean region, chickpea is a major ingredient of many Mediterranean, Middle Eastern and Indian dishes such as hummus, falafel and

curry. Chickpeas have gained considerable traction as a healthy protein ingredient because they are free from gluten, non-GMO and have a bland flavor profile that doesn't overpower other ingredients.

Chickpeas contain 24.4 g protein, 5.9 g fat, 41.1 g starches/sugars and 8.7 g fiber per 100 g serving. Chickpea protein is being used in many food and beverage applications including nondairy, sports nutrition, snacks, bars, pastas, frozen foods, meat alternatives, dressings and condiments,

Chickpea innovation is seen in Grains & Pasta, Frozen Food and Cereal & Breakfast Foods with increased product launches in the Frozen Dinner and Frozen Appetizers & Hors d'oeuvres subcategories.

*Lentils*

Lentils (*Lens culinaris*) are one of the most economical, easily available and tasty sources of proteins, fiber, vitamins A and B, potassium, iron, minerals, nutrients and complex carbohydrates. Moreover, because of its high lysine and tryptophan content, its consumption with wheat or rice provides a complete balanced diet for human consumption.

[Lentils]

**BY THE NUMBERS**

At nearly 125 products at Expo West 2017, lentils opportunities lie in the Snacks, Cookies & Candy and Grains & Pasta aisles with impressive innovation in the Chips, Pretzels & Snacks subcategory.

**Categories Innovating with Lentils**

(absolute product count change)

Expo West 2014—Expo West 2017



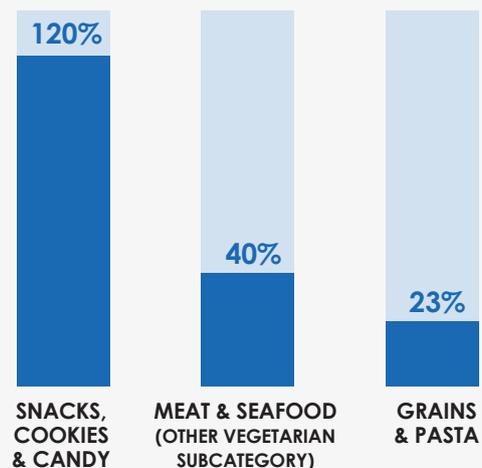
Source: New Hope Network NEXT Trend Database



**Leading Categories Innovating with Lentils**

(growth of the number of new products)

Expo West 2014—Expo West 2017



Source: New Hope Network NEXT Trend Database

Among the various types of lentils available in the market, the most common types include yellow, red, green, brown and black. Considered a staple food, lentils are affordable alternatives to protein. Due their relatively low cost, lentils are witnessing a surge in global demand worldwide. Consumption of lentils has rapidly increased in the past decade, particularly in emerging countries, such as India, Pakistan, Sri Lanka and Bangladesh, as population growth, rising disposable incomes and growing health consciousness drive the market.

Lentils contain 26.3 g protein, 1.1 g fat, 45 g starches/sugars and 13.6 g fiber per 100 g serving. In addition to the nutritional benefits, consumption of lentils has been linked to health benefits such as reducing the risk of cardiovascular disease (CVD), osteoporosis, hypertension, adrenal disease, cancer, gastrointestinal disorders and lowering levels of low-density lipoprotein (LDL) cholesterol.

Currently, rising interest in vegan and vegetarian lifestyles is catapulting the use of lentils as meat substitutes. The demand for lentils in the food and beverage industry is also increasing as lentils are used to enhance the aroma and taste of ready-to-eat foods. The flour and fractions of split lentils are also used in batters, snack foods, bakery products, breadings, beverages and meat products.

Canada represents the largest producer of lentils, accounting for more than 30 percent of the global production, followed by India, Turkey, Australia and the United States, respectively.

According to Esticast Research & Consulting, major factors restraining the lentil market are slow hydration, cooking time, unpleasant flavor and poor digestion among protein-intolerant individuals.

Lentil innovation is being seen in the Snacks, Cookies & Candy and Grains & Pasta aisles with impressive innovation in the Chips, Pretzels & Snacks subcategory.

*Peas*

Pea protein is experiencing significant growth, largely thanks to demand for plant-based food and beverages and products free from dairy and gluten. Among the other benefits of pea protein, it's rich in lysine, arginine, isoleucine, valine and glutamic acid.

Dry peas (*Pisum sativum*) contain 23.7 g protein, 1.3 g fat, 45.5 g starches/sugars and 16.6 g fiber per 100 g serving. However, it isn't a complete protein, so it's often paired with other vegan sources of protein,

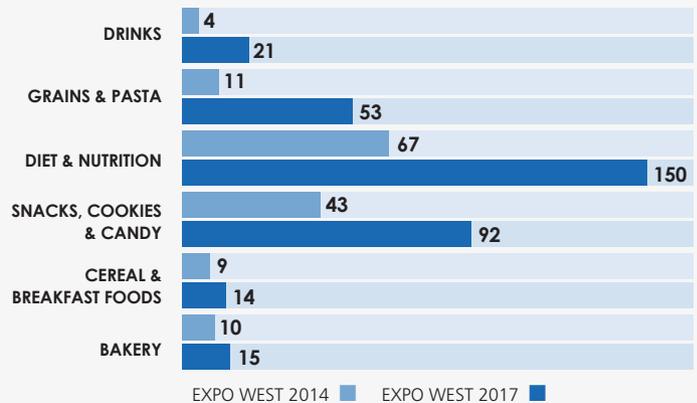
[Peas]  
**BY THE NUMBERS**

At nearly 510 products at Expo West 2017, pea opportunities lie in the Drinks and Grains & Pasta aisles with impressive innovation in the Powdered Drinks and Snack, Energy & Granola Bars subcategories.

**Categories Innovating with Peas**

(absolute product count change)

Expo West 2014—Expo West 2017

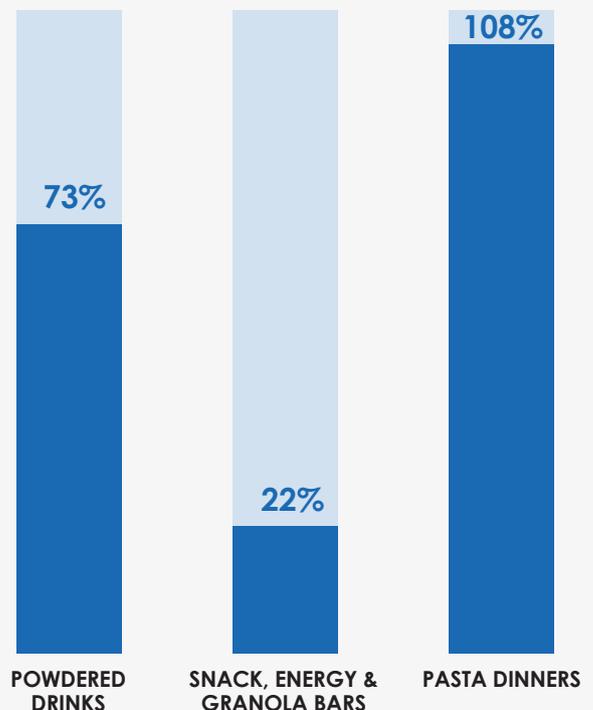


EXPO WEST 2014 ■ EXPO WEST 2017 ■  
Source: New Hope Network NEXT Trend Database

**Leading Subcategories Innovating with Peas**

(according to absolute growth of the number of new products)

Expo West 2014—Expo West 2017



Source: New Hope Network NEXT Trend Database

such as brown rice or hemp, when formulating for a sports nutrition or meal replacement product.

Green and yellow peas are used as raw material. It can be extracted in three types such as pea protein isolates, pea protein concentrate and textured pea protein. Pea isolates are a more refined version of pea concentrates while textured pea protein contains higher amount of protein as compared to concentrates and isolates.

Pea protein is used in a wide range of applications such as meat alternatives and extenders, vegan cheeses, yogurts, milks, bakery goods and snack bars. It's also commonly used to boost protein content when developing products such as nut milks. Pea proteins also offer health benefits such as support healthy weight, maintain healthy muscle, improve blood circulation and calcium absorption, boost metabolism, and regulate blood sugar among others.

Pea milk is being promoted as a sustainable alternative to other plant-based milk types, such as soy and almond. Unlike almonds, which require lots of water and are mostly grown in drought-hit California, and soy, which contributes to deforestation, peas are often produced locally and have a smaller environmental footprint.

Pea protein products can replace a significant percentage of other proteins in many food products without impacting the color, taste or texture of the product, and in many cases can offer cost savings. However, pea protein can pose challenges because of its earthy flavor and bitter off-notes, so flavor masking is essential.

Pea innovation is seen in the Drinks and Grains & Pasta aisles with impressive innovation in the Powdered Drinks and Snack, Energy & Granola Bars subcategories. ■

## [Pulses]

### MARKET MANIFESTATIONS



**RW GARCIA**

Building on the success of its line of conventional Artisan Crackers, RW Garcia expanded the line and meet the needs of organic consumers by introducing Organic 3 Seed Artisan Crackers. The crackers are available in two flavors: Organic Lentil with Turmeric and Organic Chickpea. The Non-GMO Project verified and certified gluten free organic crackers burst with flavor, crunch and unique superfood benefits, incorporating healthful ingredients such as lentils and chickpeas and a sprinkling of flaxseed, chia and sesame seeds. The crackers contain no cholesterol and no trans fats. RW Garcia's Organic 3 Seed Artisan Crackers were a finalist in the 2018 SupplySide CPG Editor's Choice Award in the Salty Snacks category.



**TADAH! FOODS**

Chickpeas are the star of TaDah! Falafel Poppers, tasty plant-based, crunchy falafel bite filled with tasty dips bursting with Mediterranean flavors. The ultra-convenient and satisfying snacks are non-GMO, gluten free and grain free, and are available in three trending flavors: Cucumber Dill Yogurt (vegetarian), Harissa Hummus (vegan) and Lemony Roasted Garlic Hummus (vegan). The company also rolled out a line of Falafel Wraps made from non-GMO tortillas and the same tasty chickpea-based hummus as its Poppers. TaDah! Falafel Wraps are available in four flavors: Lemony Roasted Garlic Hummus, Feta Salsa, Sweet and Spicy Harissa and Harissa Hummus.



**WORLD PEAS BRAND**

World Peas Brand launched Peatos™, a line of cheesy crunchy snacks made from pulses including yellow pea and lentil that pack a nutritious punch free from artificial flavors and colors. The non-GMO, protein- and fiber-rich snacks are gluten free, chock-full of minerals and sustainable. Each 130-calorie serving provides 4 g protein, 3 g fiber and 8 g fat. Available in four flavors—Classic Cheese, Fiery Hot, Chili Cheese and Masala—the better-for-you treats are taking the snack aisle to the next level. Peatos are positioned to go head-to-head with Cheetos both in flavor and marketing. Peatos were a finalist in the 2018 SupplySide CPG Editor's Choice Award in the Salty Snacks category.