

Filtration for Fermented Plant-Based Proteins



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FILTRATION SOLUTIONS

PROCESS FILTRATION

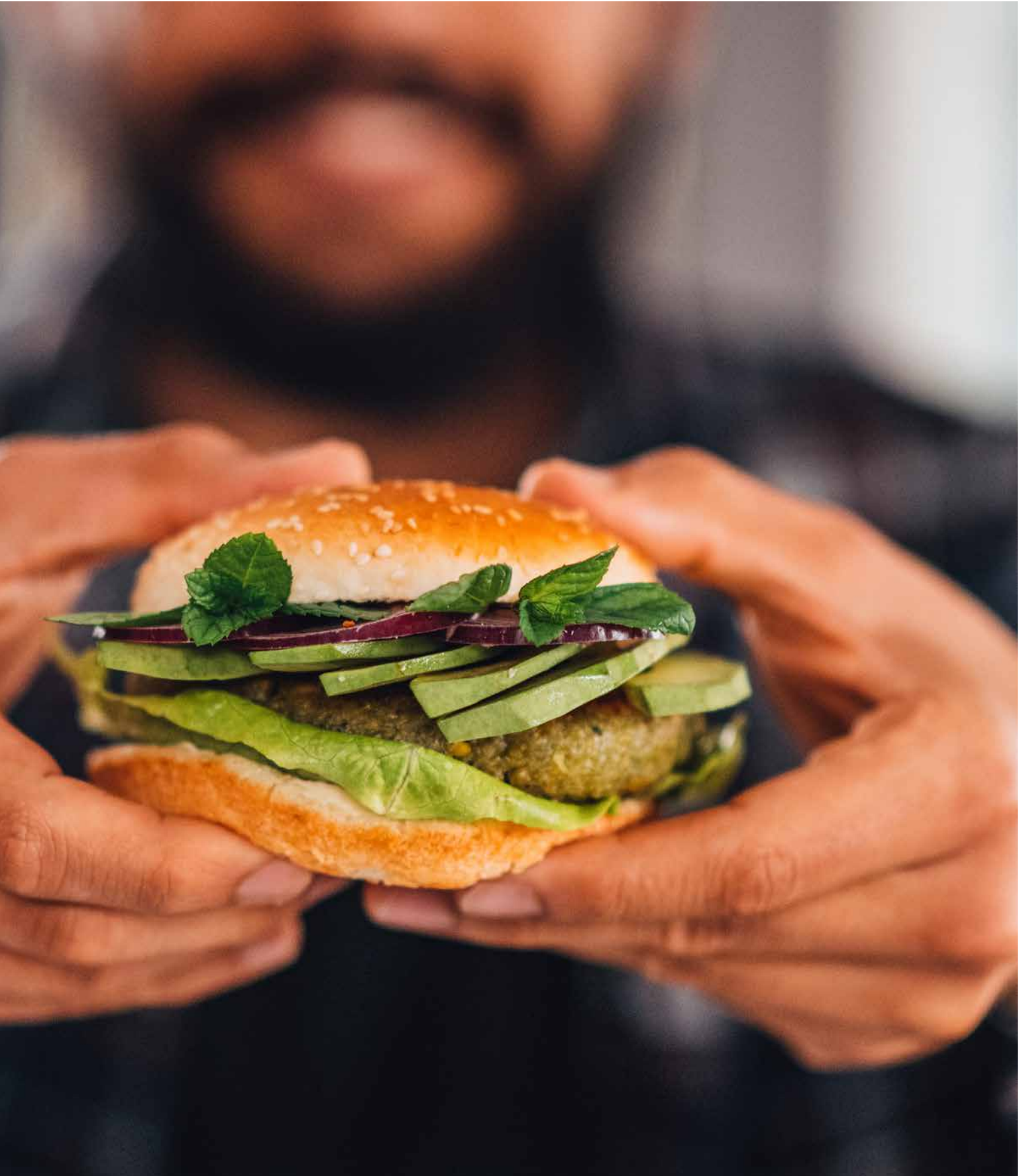
Filtration for Fermented Plant-Based Proteins

By Scott Grimes, Technical Business Development Manager at Donaldson

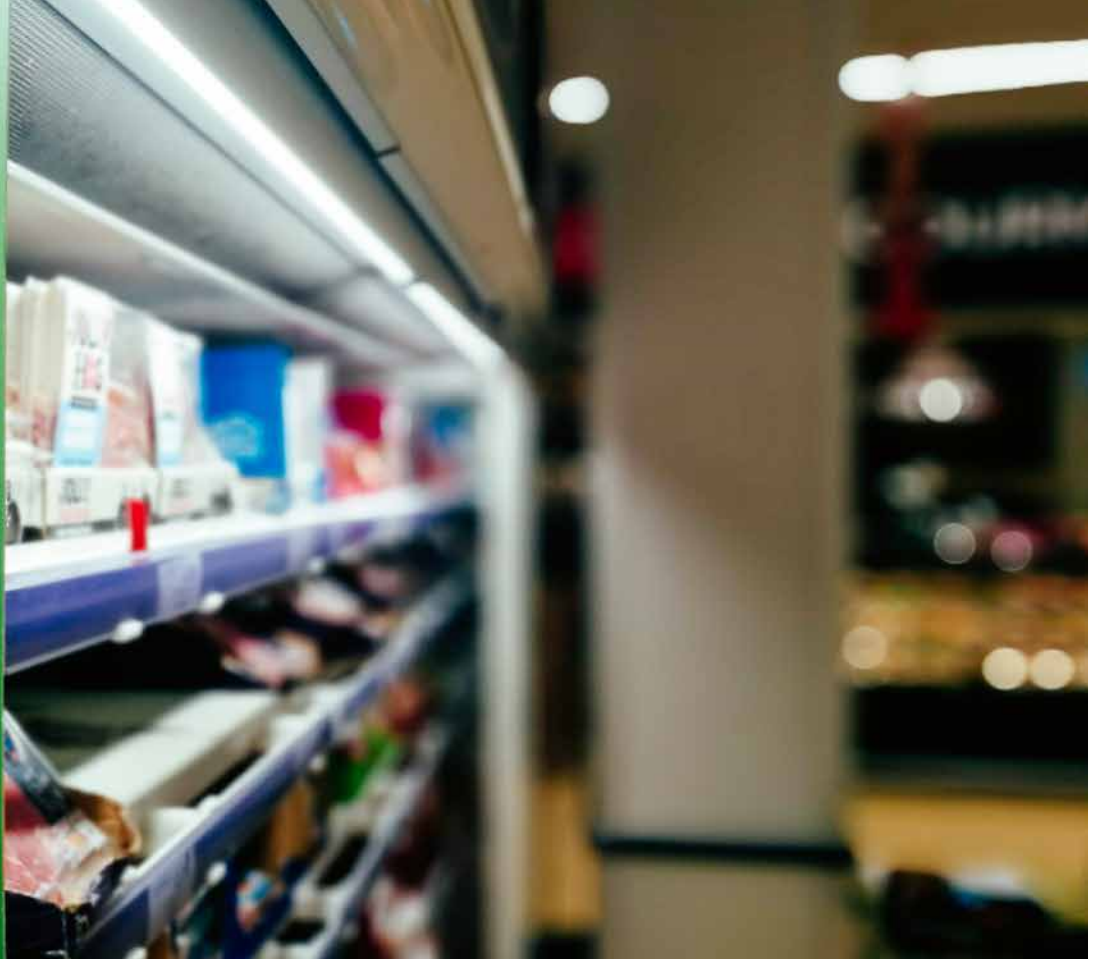
Consumer demand for healthier food options has compelled manufacturers to develop innovative ways to retain their place on the plate. Plant-based proteins and meat alternatives are growing in popularity, and companies are rapidly creating their own versions of both food items.

The increased competition is having an impact on the ingredient supply chain, so manufacturers are exploring new formulations and engineering new processes to develop equivalent products. Those processes are becoming increasingly complex and effective filtration management is a critical step in moving from research and development to successful commercial production.





Meat free



Market Demand for Plant-Based Proteins

According to a 2021 study conducted by the Plant Based Foods Association* and The Good Food Institute, retail sales of plant-based foods increased by 6.2% from 2020 to 2021, bringing the market value to an all-time high of \$7.4 billion USD. Whether in the center of the plate, as a dairy substitute, or an ingredient in an energy drink, protein alternatives have reached the mainstream across the food and beverage spectrum.



* <https://www.plantbasedfoods.org/2021-u-s-retail-sales-data-for-the-plant-based-foods-industry/>



Emerging Protein Alternatives

Current plant-based proteins have evolved well beyond just traditional bean and seed combinations. The growth and availability of potential alternatives has also inspired consumer discretion as they begin to seek more refined flavor profiles, textures, and taste characteristics.

To meet those needs, manufacturers are expanding their options and using soybean roots, mushroom stems, fungal spores, and other plant-based sources. New ingredients like these often require new production processes and the addition of fermentation. Proper filtration plays a critical role in the micro-biological processing of those materials to achieve the desired characteristics.



Manufacturing Protein Alternatives

One of the plant-based protein segment's most popular end-products – the burger patty – comes in an array of flavors, textures, and colors to appeal to as many consumers as possible. For all its variety, the category staple is still based on two primary elements: protein ingredients and structural ingredients – both of which require significant process filtration in their development.

Protein ingredients, such as fungal spores, go through a bioreaction process that requires the use of sterile filtered gases along with nutrients to support desired growth inside of the bioreactor. This process helps create unique product qualities with defining characteristics, such as texture.

Similarly, the manufacturing of key structural ingredients, like food starches, also requires strict process controls to help ensure maximum product quality. Sterile-grade gas and liquid filtration is often part of the process. Manufacturers use process-gas filtration to aid in evenly dispersing, or sparging filtered gases in the fermentation process, including during the anaerobic phase, which brings another set of sophisticated requirements.



Donaldson's family of LifeTec™ filter elements are designed for applications that require sterile compressed air and gases that help optimize the processing of food and beverages, including plant-based products. The portfolio also includes versions for liquid applications including beer and wine, non-alcoholic beverages, and food ingredients.



Partnering with Purveyors of Plant-Based Proteins

While the processes involved in plant-based protein manufacturing have become increasingly complex, they are required to meet food production safety regulations and standards. A strategically engineered solution helps food producers to meet most requirements using filtered air and liquids. Without a filtration solution, manufacturers would not be able to meet their production goals while staying in compliance.

Donaldson, along with its subsidiary, Solaris Biotechnology, are currently working with several innovative plant-based protein producers. From helping engineer initial lab-based product development feasibility studies to the creation of full-scale industrial systems, together we provide intuitive, scalable filtration solutions for plant-based food manufacturers.



To learn more, visit [donaldson.com](https://www.donaldson.com)

Important Notice

Many factors beyond the control of Donaldson can affect the use and performance of Donaldson products in a particular application, including the conditions under which the product is used. Since these factors are uniquely within the user's knowledge and control, it is essential the user evaluate the products to determine whether the product is fit for the particular purpose and suitable for the user's application. All products, specifications, availability and data are subject to change without notice, and may vary by region or country.



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