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Global Bio-based Calcium D-Pantothenate Market Growth 2026-2032

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Abstracts

The global Bio-based Calcium D-Pantothenate market size is predicted to grow from US$ 198 million in 2025 to US$ 382 million in 2032; it is expected to grow at a CAGR of 9.5% from 2026 to 2032.

In 2025, global production of bio-based calcium D-pantothenate was approximately 26,000 tonnes, with an average global market price of around $7,800 per tonne. That year, total global production capacity for the product reached approximately 43,000 tonnes, and the industry's average gross profit margin stood at about 25%. Bio-based calcium D-pantothenate is a Vitamin B5 product derived from renewable carbon sources—such as glucose, sucrose, molasses, or starch hydrolysates—through microbial fermentation followed by chemical salt formation. Chemically, it is the calcium salt of biologically active D-pantothenic acid, typically represented by the molecular formula C??H??CaN?O??. Due to the limited stability and processing suitability of free pantothenic acid, it is commonly marketed as a calcium D-pantothenate powder or granule for use in foods, dietary supplements, pharmaceuticals, and animal feed. D-pantothenic acid is a crucial component of Coenzyme A and acyl carrier proteins, playing a vital role in the metabolism of fats, carbohydrates, and proteins; commercial calcium D-pantothenate generally exhibits excellent water solubility, storage stability, and blending characteristics. The term "bio-based" here primarily indicates that the carbon backbone of the pantothenic acid is derived from renewable raw materials via fermentation; it does not imply that the product is biodegradable, nor should it be confused with the biologically inactive L-form or DL-form of calcium pantothenate.

The upstream segment of the bio-based calcium D-pantothenate value chain primarily encompasses raw materials such as corn starch sugars, glucose, sugarcane molasses, and other fermentable carbon sources, alongside ?-alanine, pantoic acid precursors,

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engineered microbial strains, culture media, enzyme preparations, and fermentation equipment. Modern production typically employs metabolic engineering to modify industrial microorganisms—such as *Escherichia coli* or *Corynebacterium glutamicum*—to enhance pantothenic acid biosynthetic pathways, thereby converting renewable sugar sources into D-pantothenic acid or fermentation broth intermediates. Core upstream competitiveness centers on strain yield, fermentation concentration, sugar conversion efficiency, impurity control, and the stability of raw material supplies; factors such as carbon source prices, the consumption of nitrogen sources and nutrient salts, and aseptic control during fermentation directly impact production costs. For food- and feed-grade products, upstream raw materials must also meet requirements regarding traceability, non-GMO declarations, allergen status, and relevant regulatory standards. The midstream segment consists of vitamin manufacturers, fermentation companies, and nutritional ingredient suppliers responsible for processes including seed culture, aerobic fermentation, cell separation, decolorization and desalting, concentration and purification, as well as salt formation (reacting D-pantothenic acid with a calcium source), crystallization, drying, and sieving. Depending on the intended application, it can be further processed into high-purity D-calcium pantothenate powder, granules, spray-dried products, and premixes. Key technical challenges lie in controlling the content of D-isomers, residual organic acids, inorganic salts, moisture, and color, while ensuring stability during long-term storage and the feed pelleting process. Animal nutrition represents one of the largest downstream applications for bio-based D-calcium pantothenate; it is commonly added to vitamin premixes, compound feeds, and pet foods to support energy metabolism, growth, skin health, and feed utilization. The European Union has authorized D-calcium pantothenate as a nutritional feed additive for various animal species. In the food and dietary supplement sectors, it is primarily used in tablets, capsules, beverages, breakfast cereals, and fortified foods, while the pharmaceutical sector utilizes it in vitamin preparations, compound nutritional products, and specific medicinal formulations. Although the personal care industry predominantly uses its derivative, D-panthenol, D-calcium pantothenate is also incorporated into certain "nutricosmetic" and functional formulations. Future market growth will be driven by the expansion of the global feed industry, the premiumization of pet nutrition, the demand for food fortification, and cost reductions in fermentation-based vitamin production; meanwhile, industry competition will continue to center on strain efficiency, product purity, fermentation costs, regulatory registration, and the ability to ensure stable global supply.

Calcium D-pantothenate is a key commercial form of Vitamin B5, widely used in premixes for livestock, aquaculture, and pet feed to support energy metabolism, growth, and feed utilization. As the global intensive livestock, aquaculture, and pet food

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industries continue to expand, there remains steady demand for vitamin ingredients that offer formulation stability, ease of blending, and high bioavailability.

Beyond feed-grade applications, Calcium D-pantothenate is used in breakfast cereals, beverages, tablets, capsules, syrups, and multivitamin formulations. With growing consumer interest in energy metabolism, comprehensive nutrition, and functional foods, demand is expected to rise for food- and pharmaceutical-grade products, as well as those meeting specific standards such as vegan, Halal, Kosher, and allergen-free certifications.

The competitiveness of bio-based Calcium D-pantothenate hinges on the performance of engineered strains, sugar conversion rates, the cost of key intermediates (such as ?-alanine), and the efficiency of downstream processes like separation, desalting, and crystallization. Moving forward, companies are likely to employ metabolic engineering to boost D-pantothenate yields and fermentation concentrations. They will also seek to strengthen integrated production chains—linking glucose to ?-alanine (or pantothenate intermediates) and finally to Calcium D-pantothenate—to minimize reliance on external intermediates and mitigate the impact of price volatility. Regulatory bodies continue to review applications for the use of engineered *E. coli* to produce Calcium D-pantothenate as a nutritional additive for all animal species; this underscores that strain safety, residue control, and production consistency will remain critical focal points for industry technology and market access.

Report Scope

LP Information, Inc. (LPI) ' newest research report, the “Bio-based Calcium D-Pantothenate Industry Forecast” looks at past sales and reviews total world Bio-based Calcium D-Pantothenate sales in 2025, providing a comprehensive analysis by region and market sector of projected Bio-based Calcium D-Pantothenate sales for 2026 through 2032. With Bio-based Calcium D-Pantothenate sales broken down by region, market sector and sub-sector, this report provides a detailed analysis in US$ millions of the world Bio-based Calcium D-Pantothenate industry.

This Insight Report provides a comprehensive analysis of the global Bio-based Calcium D-Pantothenate landscape and highlights key trends related to product segmentation, company formation, revenue, and market share, latest development, and M&A activity. This report also analyzes the strategies of leading global companies with a focus on Bio-based Calcium D-Pantothenate portfolios and capabilities, market entry strategies, market positions, and geographic footprints, to better understand these firms’ unique

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position in an accelerating global Bio-based Calcium D-Pantothenate market.

This Insight Report evaluates the key market trends, drivers, and affecting factors shaping the global outlook for Bio-based Calcium D-Pantothenate and breaks down the forecast by Type, by Application, geography, and market size to highlight emerging pockets of opportunity. With a transparent methodology based on hundreds of bottom-up qualitative and quantitative market inputs, this study forecast offers a highly nuanced view of the current state and future trajectory in the global Bio-based Calcium D-Pantothenate.

This report presents a comprehensive overview, market shares, and growth opportunities of Bio-based Calcium D-Pantothenate market by product type, application, key manufacturers and key regions and countries.

Market Segmentation

Segmentation by Type:

Purity:98%-99%

Purity:?99%

Segmentation by Production Technology Route:

Fermentation-Chemical Salt Formation

Bio-based Intermediate Coupling

Enzyme-catalyzed Synthesis

Others

Segmentation by Renewable Raw Material Source:

Sugar-based Calcium D-pantothenate

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Starch-based Calcium D-pantothenate

Lignocellulose-based Calcium D-pantothenate

Others

Segmentation by Physical Form:

Powder-form Calcium D-pantothenate

Granular Calcium D-pantothenate

Microencapsulated or Coated Calcium D-pantothenate

Segmentation by Application:

Feed

Pharmaceutical

Cosmetics

Food Additives

Others

This report also splits the market by region:

Americas

United States

Canada

Mexico

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- Brazil

APAC

- China
- Japan
- Korea
- Southeast Asia
- India
- Australia

Europe

- Germany
- France
- UK
- Italy
- Russia

Middle East & Africa

- Egypt
- South Africa
- Israel
- Turkey

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GCC Countries

The below companies that are profiled have been selected based on inputs gathered from primary experts and analysing the company's coverage, product portfolio, its market penetration.

BASF

Alfa Chemistry

Anhui Huaheng Biotechnology Co.,Ltd.

Yifan Pharmaceutical

Zhejiang Hangzhou Xinfu Pharma

Shandong Hwatson Biochem

Xinfa Pharmaceutical

Key Questions Addressed in this Report

What is the 10-year outlook for the global Bio-based Calcium D-Pantothenate market?

What factors are driving Bio-based Calcium D-Pantothenate market growth, globally and by region?

Which technologies are poised for the fastest growth by market and region?

How do Bio-based Calcium D-Pantothenate market opportunities vary by end market size?

How does Bio-based Calcium D-Pantothenate break out by Type, by Application?

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