

Fermenta Biotech Bets on Plant-Based Vitamin D3 to Drive Next-Generation Fortification

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Prashant Nagre, Managing Director, Fermenta Biotech

As consumer demand for plant-based, clean-label and sustainable nutrition solutions continues to reshape the food and nutraceutical landscape, the availability of plant-source Vitamin D3 is opening new possibilities for manufacturers in India. Fermenta Biotech's VITADEE Green, a plant-source cholecalciferol developed through a patented manufacturing process,

has received approval from the Food Safety and Standards Authority of India (FSSAI), marking a significant step towards commercial adoption of plant-based Vitamin D3 across food fortification, nutraceuticals and functional nutrition.

The development comes against the backdrop of persistent Vitamin D deficiency across India and South Asia, while vegetarian and vegan consumers increasingly seek nutritional products that align with their dietary preferences without compromising on the established benefits of Vitamin D3. By converting plant-derived phytosterols into cholecalciferol, VITADEE Green® aims to bridge this gap while offering manufacturers a scalable and domestically produced alternative.

In this interview with NUFFOODS Spectrum Asia, Prashant Nagre, Managing Director, Fermenta Biotech, discusses the significance of the FSSAI approval, the scientific and technological journey behind VITADEE Green, and the evolving demand for plant-derived micronutrients across Asia-Pacific. He also outlines Fermenta's plans around food fortification, industry collaborations and the company's broader strategy spanning nutrition, biotechnology and green chemistry.

The recent FSSAI approval marks an important milestone for VITADEE Green. How do you expect this regulatory clearance to influence the adoption of plant-based Vitamin D3 across India's food fortification, nutraceutical and functional food sectors?

The FSSAI approval on Fermenta's Vitamin D3 (Cholecalciferol) – Plant Source converts a significant scientific innovation into a commercially actionable ingredient for the Indian nutrition industry. It provides manufacturers with the regulatory clarity required to begin structured product development and formulation discussions across Health Supplements, Nutraceuticals and Food Products, including relevant fortified foods, food and beverage products and dietary supplements. For formulators, regulatory acceptance is often the first major gateway. With that gateway now open, companies can evaluate VITADEE Green for new launches, portfolio extensions and differentiated products that respond to vegetarian-friendly, plant-based and sustainability-led consumer preferences. We also recognise that approval alone does not guarantee adoption. The ingredient must deliver on quality, application performance, consistent supply, scalability and commercial viability. VITADEE Green has therefore been developed as a sustainable, scalable and affordable plant-source Vitamin D3 proposition, backed by Fermenta's longstanding Vitamin D3 expertise, an Indian process patent and domestic manufacturing capabilities. We believe this can progressively move plant-sourced Vitamin D3 from a relatively specialised proposition into a broader formulation option for India's nutrition industry, subject to application suitability and regulatory guidance.

Vitamin D deficiency remains a significant public health challenge in India and many parts of Asia. How can plant-based Vitamin D3 solutions contribute to addressing this gap, particularly among vegetarian and vegan consumers?

Low Vitamin D status is a complex nutrition challenge and cannot be addressed by one product or intervention alone. It requires a combination of awareness, appropriate testing, medical guidance, supplementation where required and responsible food fortification. Studies across South Asia have reported a substantial prevalence of low Vitamin D status, although the levels vary considerably across populations and diagnostic thresholds. Plant-source Vitamin D3 can expand the range of solutions available within this broader response. For vegetarian and vegan consumers, ingredient origin is an important consideration. Until now, there have been relatively limited options that allow these consumers to access Vitamin D in the D3 or cholecalciferol form while remaining aligned with their dietary preferences. VITADEE Green addresses this gap by offering D3 in a plant-sourced format. It gives supplement, food and beverage manufacturers an opportunity to develop vegetarianfriendly and plant-based nutrition products without moving away from the familiarity and established relevance of cholecalciferol.

Its largest contribution will emerge when quality plant-source solutions are made available at meaningful scale and accessible price points across appropriate supplement and fortification formats.

Fermenta Biotech has developed and patented a plant-source Vitamin D3 manufacturing process. What were the key scientific and technological challenges in developing this innovation, and what differentiates VITADEE Green from conventional Vitamin D3 and Vitamin D2 ingredients?

VITADEE Green was the result of a decade-long research effort. Without disclosing proprietary process details, the fundamental challenge was not merely to produce Vitamin D3 from a plant source at laboratory level. It was to develop a scientifically robust and commercially viable process that could consistently deliver cholecalciferol at scale while meeting stringent expectations around purity, stability, reproducibility, quality and regulatory compliance. The process uses plant phytosterols sourced from a soy-processing by-product stream. Our scientists had to establish a route that could transform this plant-based starting material into Vitamin D3 while ensuring that the final molecule remained equivalent to cholecalciferol produced through other established routes. Scaling that chemistry from research to repeatable commercial manufacturing was one of the most significant aspects of the development. The distinction from other Vitamin D3 ingredients is primarily in the source, manufacturing process and proposition. VITADEE Green remains Vitamin D3 – cholecalciferol but is produced

through a patented plant-source process. This makes it relevant for vegetarian, vegan, clean-label and sustainability-led product development. Compared with Vitamin D2, VITADEE Green allows brands to retain a plant-based proposition while formulating with D3. Research comparing the two major forms of Vitamin D has generally found Vitamin D3 to be more effective than Vitamin D2 in raising total serum 25-hydroxyvitamin D concentrations. Plant-source D3 therefore provides an important bridge between plant-based dietary preferences and the D3 form.

With consumers increasingly seeking clean-label, sustainable and plant-based ingredients, how do you see demand for plant-derived micronutrients evolving across the Asia-Pacific nutraceutical and food industries over the next five years?

Over the next five years, we expect the plant-derived micronutrient conversation to move beyond a niche vegetarian claim. Ingredient origin will increasingly become part of a wider discussion involving traceability, supply-chain resilience, responsible sourcing, clean-label formulation and sustainability commitments. This will create opportunities across supplements, functional foods and beverages, fortified foods and specialised nutrition products. Brand owners will look for future-ready ingredients that not only support a consumer-facing plant-based proposition but can also withstand the scrutiny of procurement, emphasizing on traceability, R&D, regulatory and sustainability teams. However, demand will not grow solely because an ingredient is plant sourced. Successful adoption will depend on four fundamentals: strong science, regulatory acceptance, consistent quality at commercial scale and a viable price-to-value proposition. For VITADEE Green, this means positioning the ingredient not simply as another vegetarian Vitamin D3, but as a sustainable, scalable and affordable option for the right application and the right customer requirement.

The approval aligns with India's 'Make in India' initiative and the growing focus on food fortification. Are there plans to expand collaborations with food manufacturers, government programmes or healthcare stakeholders to accelerate Vitamin D fortification across the country?

Collaboration will be central to building an effective food-fortification ecosystem. No single ingredient manufacturer can address a national nutrition challenge independently. Progress requires coordinated participation from government institutions, academia, food manufacturers, nutrition experts, healthcare stakeholders, testing laboratories and ingredient companies. Fermenta is already strengthening this ecosystem through its collaboration with NIFTEM-T to establish a Centre of Excellence for Food Fortification. The objective is to create a platform for research, pilot-scale development, application testing, technical capability building and industry-academia engagement around fortification. This is supported by Fermenta's existing nutrition infrastructure, including our FSSAI and GAIN-certified vitamin-mineral premix facility in Kullu and our Fortified Rice Kernel manufacturing capability in Tirupati. These capabilities allow us to participate in fortification discussions at both the ingredient and application levels. With VITADEE Green, potential collaborations could include formulation development, stability and application studies, pilot fortification projects, technical training and consumer-awareness initiatives. We are also open to contributing to appropriately structured government and public-health programmes.

Beyond VITADEE Green, what are Fermenta Biotech's strategic priorities for expanding its nutrition and nutraceutical portfolio, and what innovations can the industry expect from the company in the near future?

Our broader strategy is to build an integrated, science-led nutrition and biotechnology platform rather than depend on a single product or market. The first priority is to continue strengthening our Vitamin D3 platform through new sources, formats, derivatives and application-led solutions. VITADEE Green is an important part of that strategy because it demonstrates how Fermenta can combine deep category expertise with proprietary technology, sustainability and evolving customer needs. The second priority is nutrition and food fortification. We intend to deepen our capabilities in customised vitamin-mineral premixes, fortified food solutions and Fortified Rice Kernels while working more closely with food manufacturers, institutions and technical partners. Our objective is to move beyond supplying individual ingredients and participate in the development of stable, scalable and regulatory-aligned nutrition solutions. The third priority is biotechnology and green chemistry. Fermenta will continue advancing industrial enzymes, specialty biotechnology processes and solutions that enable cleaner and more efficient manufacturing. Specialty APIs, customer-led development and technically differentiated ingredients will also remain important parts of our growth framework. The industry can expect Fermenta's innovation pipeline to remain focused on three principles: scientific credibility, commercial scalability and responsible manufacturing.