



# Export Trend Analysis and Future Forecast of Eggshell Powder and Its Value-Added Products in India

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**Abstract-** This study examines eggshell powder and its value-added products, as well as their increasing industrial and economic importance. India produces a high number of eggs each year, resulting in substantial eggshell waste. Instead of being thrown, eggshells can be converted into beneficial goods such as calcium supplements, animal feed additives, fertilizers, and cosmetics. Utilizing eggshell waste reduces environmental contamination and encourages sustainable resource usage. The report analyzes export patterns using secondary data from sources such as the Directorate General of Foreign Trade (DGFT) and the Ministry of Commerce and Industry. Tools like as growth rate, and trend projection are used to assess previous export success and forecast future market opportunities.

**Keywords-** Egg shell powder, value-added products, Exporter and waste reduces.

## I. Introduction

India is one of the largest producers of eggs, which leads to a huge amount of eggshell waste from poultry farms and food industries. Earlier, eggshells were treated as waste and disposed of in landfills, causing environmental problems. However, with recent developments, eggshells are now recognized as a valuable bio-resource. Eggshell powder, mainly composed of calcium carbonate, is widely used in food fortification, pharmaceuticals, animal feed, fertilizers, and cosmetics.

Eggshell powder is produced by cleaning, drying, sterilizing, and grinding eggshells into a fine powder. Due to its natural, eco-friendly, and cost-effective properties, it has gained importance in many industries. In addition to basic powder, several value-added products such as calcium supplements, bio-fertilizers, and feed additives are developed, which help reduce waste and create new economic opportunities.

This project analyzes the export trends and future growth potential of eggshell powder and its value-added products using secondary data from DGFT based on relevant HSN codes. By studying past export trends and market demand, the study aims to forecast future opportunities and highlight the economic and environmental benefits of converting eggshell waste into valuable products.



### Objective

- To study the export market and frequency of eggshell powder export
- To access future growth prospect of eggshell powder in the global market.

## II. Literature Review

1. **Rabita Akbari Sitompul et al (2025) “Circular Economy in Action: Valorising Eggshell Waste for Sustainable Construction Practices”** Sustainable construction increasingly focuses on circular economy practices. Instead of mining calcium carbonate, eggshell powder (ESP) from food waste can be reused in building materials. Studies show that replacing 10-20% with ESP can improve strength, reduce permeability, and enhance durability. However, challenges remain in standardization, large-scale use, and long-term performance. Overall, ESP supports eco-innovation by reducing waste and promoting sustainable resource management in construction.
2. **Plamen Saraliev et al (2025) “Egg By-Products: Composition, Bioactive Potential, and Utilization in the Circular Economy”** The egg processing industry produces by-products like eggshells, liquid residues, and membranes, which can be reused under circular economy principles. Eggshells are rich in calcium carbonate, liquid by-products contain useful proteins, and membranes have collagen and hyaluronic acid. Proper utilization reduces environmental impact and creates valuable products.
3. **Mr. K. Viswaja et al (2024) “Eco-Friendly Concrete: Enhancing Sustainability with Eggshell Powder as a Partial Cement Substitute”** Industrial and biodegradable waste disposal is a growing environmental issue, especially eggshell waste from food industries. Since eggshells are rich in calcium, this study tests eggshell powder (ESP) as a partial cement replacement in M30 concrete to reduce CO2 emissions and energy use. Concrete with 0%-12.5% ESP was evaluated for strength and workability to assess its suitability as an eco-friendly construction material.

## III. Research Methodology

The study adopts a descriptive and analytical research design to examine the market performance and export trends of eggshell powder and its value-added products. The research is based entirely on secondary data collected from reliable government sources such as the Directorate General of Foreign Trade (DGFT), Ministry of Commerce and Industry, and Agricultural and Processed Food Products Export Development Authority (APEDA).

The analysis covers a five-year period (2019–2024) to understand growth patterns and future potential. Statistical tools such as growth rate calculation, and trend projection were used to analyse export trends and forecast future demand. However, the study is limited as it relies on past data patterns and does not include primary surveys, and external factors like market fluctuations and policy changes may influence actual outcomes.



#### IV. Analysis and Interpretation

The Table Showing the Total Exports & Trend Projection of the Top 10 Egg-Based and Egg-Shell Value-Added Export Products from India

Table 1

Year	Total Exports
2020	87,71,396.90
2021	87,39,938.95
2022	80,41,501.66
2023	85,88,056.18
2024	11298509.96

Table 2

Year	Trend Projection
2025	11861310.3
2026	12454375.8
2027	13077094.6
2028	13730949.3
2029	14417496.8
2030	15138371.6

##### Interpretation:

The above table shows the total exports of top 10 egg-based and egg-shell value-added export products from India show a fluctuating trend between 2020 to 2024. Exports remained nearly flat between 2020 (₹87.71 lakh) and 2021 (₹87.40 lakh), indicating a period of stagnation likely influenced by COVID-19 disruptions in global trade. A notable contraction occurred in 2022, with total exports declining by approximately 8% to ₹80.42 lakh. This may reflect supply-chain disruptions, increased domestic demand, or geopolitical trade headwinds post-pandemic.

Exports partially recovered to ₹85.88 lakh in 2023, signalling renewed international demand for Indian egg-based products. A sharp surge of ~31.6% was recorded in 2024, reaching ₹1,12,98,509.96 — the highest level in the five-year window. This robust growth suggests increased global acceptance and competitiveness of Indian egg-derived exports. The trend projection chart illustrates a consistent upward growth trajectory from 2025 to 2030, using an exponential smoothing / growth-rate model derived from the 2020–2024 base period. Approximately 8% per annum over the 2025–2030 forecast horizon, implying sustained demand expansion.

Total export value is projected to reach ₹1,51,38,371.6 — a 34% increase over the 2024 level — underscoring the long-term growth potential of India's egg-value-added export sector. The chart's upward-sloping curve with increasing steepness reflects compounding growth momentum, driven by rising global demand for protein-rich food ingredients, nutraceuticals, and pharmaceutical excipients.



## Findings

The analysis of export data for the top ten egg-based and eggshell value-added products from India between 2020 and 2024 reveals several significant trends in export performance and future growth potential. Overall, the sector demonstrates a fluctuating yet generally upward trajectory, with strong recovery after the disruptions caused by the COVID-19 pandemic. Total exports remained relatively stagnant in 2020 and 2021 but declined in 2022 due to supply chain disruptions and global trade uncertainties. However, exports recovered in 2023 and experienced a substantial increase in 2024, indicating renewed global demand and improved competitiveness of Indian egg-derived products in international markets.

## V. Product based findings

### Dried Egg Yolk Market Expansion

- The export value almost doubled in 2022, showing increasing demand from food and nutraceutical industries.
- The projected trend indicates continuous growth up to 2030, highlighting the growing use of egg yolk in processed foods.

### Calcium Carbonate Powder Volatility with Long-Term Growth

- Export values fluctuated significantly between 2020 and 2024, but a strong rebound occurred in 2024.
- This growth reflects rising global demand for eggshell-derived calcium in pharmaceutical, food, and construction industries.

### Animal Feed Preparation Export Growth

- Exports showed strong growth in early years but declined in 2022 and 2023 due to possible market competition.
- However, 2024 recorded the highest export value, and projections show continued expansion due to demand from global livestock industries.

### Cosmetics Sector Shows Extreme Fluctuation but High Potential

- The cosmetics category recorded an exceptionally high spike in 2023, possibly due to bulk international orders.
- Despite the drop in 2024, the sector still shows significant growth compared to earlier years, indicating rising demand for egg-protein-based cosmetic ingredients.

### Toothpaste/Dentifrices Show Stable and Consistent Growth

- This category displayed continuous year-on-year growth from 2020 to 2024, making it one of the most reliable export segments.
- Increasing use of eggshell calcium in oral care products supports this steady demand.

### Pharmaceutical Preparations Dominate Export Value

- Pharmaceutical products represent the largest share of exports among all categories.
- After a slight decline between 2020 and 2022, exports recovered strongly in 2024, reflecting global demand for egg-derived pharmaceutical ingredients.



### **Rapid Growth in Nutraceutical and Calcium Tablet Exports**

- Calcium tablets and nutraceutical supplements demonstrated consistent upward growth, driven by increasing global health awareness and demand for natural calcium sources.

### **Growth in Aquaculture Feed Supplements**

- Although exports declined in 2022 and 2023, a strong recovery occurred in 2024, suggesting renewed demand from aquaculture industries.

### **Emerging Opportunity in Calcium-Fortified Food Premixes**

- While currently a smaller segment, the category showed strong growth in 2024 and is projected to nearly double by 2030, driven by global food fortification initiatives.

### **Suggestions**

- The government and exporters should focus on expanding international markets for egg-derived products through trade agreements and export incentives.
- Industries should increase investments in advanced processing technologies to produce high-quality egg powders, nutraceuticals, and pharmaceutical ingredients.
- Since these segments generate the highest export value, greater attention should be given to research, innovation, and quality certification in these industries.
- Exporters should obtain international certifications such as ISO, GMP, and HACCP to increase global trust in Indian egg-derived products.
- Companies should explore emerging markets in Southeast Asia, Africa, and the Middle East to reduce dependency on a few major markets.
- Improving storage, transportation, and cold-chain logistics will help maintain product quality and increase export competitiveness.
- Promoting the use of eggshell waste for calcium products and feed supplements can reduce waste while generating additional export revenue.
- Universities and research institutions should collaborate with industries to develop innovative egg-based products for pharmaceuticals, cosmetics, and health supplements.
- Financial support, subsidies, and training programs should be provided to SMEs to help them enter the export market.
- Participation in international trade fairs and digital marketing campaigns can increase the visibility of Indian egg-based products worldwide.

## **VI. Conclusion**

The study concludes that India's egg-based and eggshell value-added export sector has significant growth potential despite short-term fluctuations in international trade. The analysis indicates that the industry has successfully recovered from pandemic-related disruptions and is entering a phase of sustained expansion driven by increasing global demand for protein-rich foods, natural mineral supplements, pharmaceutical bioactives, and eco-friendly industrial ingredients. High-value sectors such as pharmaceutical preparations, nutraceutical supplements, and dentifrice products are expected to remain the key drivers of export growth due to their strong market demand and consistent performance.



At the same time, emerging segments such as calcium-fortified food premixes, aquaculture mineral supplements, and egg-based cosmetics present new opportunities for diversification and market expansion. The projected upward trend in exports through 2030 highlights India's increasing competitiveness in the global market for egg-derived products. With continued investment in processing technology, quality certification, and international market development, India can further strengthen its position as a leading exporter of egg-based value-added products. Overall, the findings suggest that the sector is poised for long-term growth and can contribute significantly to India's agricultural export economy in the coming decade.

### Reference

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