

# **Polylysine Market Assessment, By Product Type [Powder, Liquid], By Grade [Food Grade, Pharma Grade], By Application [Preservative, Cell Attachment, Antimicrobial Effect, Others], By End-user [Food and Beverage, Cosmetics and Personal Care, Pharmaceuticals, Dietary Supplements, Others], By Region, Opportunities and Forecast, 2017-2031F**

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## **Abstracts**

Global polylysine market is projected to witness a CAGR of 7.9% during the forecast period 2024-2031, growing from USD 775.32 million in 2023 to USD 1424.47 million in 2031. Polylysine is progressively benefitting as its adoption is increasing in numerous applications, such as food preservative, cosmetic formulation, and pharma, due to its antimicrobial properties. According to recent data published by Cosmetics Design Europe, the accumulated sales for the L'Oréal Group during the first six months of 2023 was USD 22.55 billion, which is a remarkable growth of 12%, contributing to all regions and divisions where a strong share comprises from dermatological beauty and consumer products.

The rising demand for long-term preserved food and lowered toxin-food bacteria significantly propels the polylysine market. Likewise, the growing trend for ready-to-eat (RTE) food across European nations is rising rapidly, which, in turn, has encouraged food companies to manufacture such products with valuable nutrients and extended shelf life without altering the aroma and flavor of food products. According to the recent data published by Food Drink Europe, a European Union food and beverage association, the food and beverage sector turnover in the European Union registered an annual growth rate of 2.6%, reaching USD 1,180.5 billion in 2022.

Polylysine is a naturally occurring compound that comprises polymer chains of the essential amino acid L-lysine, a prominent protein that essentially contributes to human health and growth. The polylysine market is experiencing massive growth due to its significant properties like its suitability for versatile applications in feed, food, and cosmeceutical. Polylysine finds extensive applications in food products as it provides a broad-gauge antibacterial spectrum, especially for Gram-negative bacteria, and it can deliver effective functional characteristics over a wide range of pH values. Polylysine is gaining prominence as natural food additives by fully or partially replacing synthetic additives. For instance, epsilon polylysine ( $\epsilon$ -Polylysine) is recognized as a food grade that prominently meets the FAO/WHO specifications and is certified as GRAS (Generally Recognized as Safe) by the United States Food and Drug Administration (FDA). Consequently, the revenue advancement of the prominent food and cosmetic sectors are accelerating the adoption of the polylysine material range. As a result, the increase in the demand for polylysine is propelling the growth of the global market.

### Versatile Application as Food Additives is Contributing Towards the Growth of Polylysine Market

The increasing demand for replacing synthetic food preservatives encourages food companies to incorporate polylysine as an effective alternative. Polylysines are polymers of the naturally occurring canonical amino acid 'Lysine', which are linked via intra epsilon-nitrogen. Polylysine molecules are cationic charged and behave as surface active agents in water due to their positively charged amino groups. Polylysine possesses excellent antimicrobial properties that inhibit the multiple growths of bacteria, yeasts, and molds and bacteria, especially Gram+ bacteria. It is considered one of the safest food additives that substantially restricts the growth characteristics of pathogenic bacteria that release toxins in food that gradually cause food degradation. Polylysine can effectively work even in minor quantities, therefore not affecting the taste qualities of food. Hence, the overall positive market factors for effective food preservatives contribute to the polylysine market's growth.

For instance, food and beverage is the highest revenue sector where the major share is attributable to rapid demand for food preservatives across various regions. Data released by Nutraceuticals World states that in 2023, the United States dietary supplement market has been estimated at an annual sale of USD 50 billion due to the rising demand for health and wellness products.

### Antimicrobial Effect of Polylysine is Propelling their Usage in the Cosmetic Industry

Cosmetic products are more vulnerable to the pollution caused by microbes that can leave a bad impact on human skin, successively leading to harmful effects. The role of preservatives becomes imperative to control the deterioration of cosmetic products and extend their shelf life. Polylysines are Generally Recognized as Safe (GRAS) certified. They are effective over a wide range of pH values and possess excellent thermal stability. The GRAS-certified polylysine has extensive applications in soap solutions, sunscreen lotions, gels, hair conditioners, etc.  $\gamma$ -Polylysine is also used in cosmetics to deliver alcohol-free, paraben-free, and phenoxyethanol-free characteristics. *Malassezia furfur* is a dandruff-causing bacteria against which  $\gamma$ -Polylysine imparts a bactericidal effect, along with removing any unwanted side effects. Due to the above-mentioned factors, polylysine market is anticipated to experience massive growth.

For instance, a data published by Cosmetics Design Europe states that Unilever experienced a massive sales growth of 9.1% during the first half of 2023 where its beauty and wellbeing segment saw a sales growth of 8.6% at USD 6.67 billion and personal care was grown up by 7.3% at USD 8.0 billion. In addition, around 4.7 million prestige cosmetics and beauty outlets progressively contribute to generating revenue of USD 19.43 billion in 2023 across the United States.

#### Asia-Pacific Market is Progressively Contributing to the Growth of Polylysine Market

India and China comprise the maximum share of the global population, and people are becoming more health-conscious, which successively drives the market of polylysine. Companies like JNC Corporation, Henan Daken Chemical Co., Ltd, Bimal Pharma Pvt., Ltd., and Jiangsu Yiming Biological Technology Co., Ltd. are progressively developing active polylysine for providing different functional characteristics in the Asia-Pacific region.

The Asia-Pacific demographic has always been a strong driving factor in the growth of the world's beauty and personal care products. The concept of 'green chemistry' in most Asian countries has been successively embraced, committing to transform entire cosmetic formulation towards a 95% bio-based ingredient portfolio. Furthermore, a recent report by IQVIA has ranked 21 countries as pharm-emerging where most companies are from Asia and have a high-growth pharmaceutical market. According to Nutraceuticals World, China, and Japan represent around 9% and 22% of the Nutri cosmetics/beauty supplements market, whereas the United States contributes only about 2% of skin health supplement sales. Therefore, with such a definite investment, Asia-Pacific is considered a prominent contributor to the growth of the polylysine market.

## Impact of COVID-19

The shutdown of retail shops in different verticals due to the imposed lockdown in 2020 significantly deteriorated economic stability. The revenue for cosmetic sectors drastically reduced during the pandemic due to lower consumer demands. The unavailability of resources and manpower for building effective manufacturing solutions also significantly affected the polylysine market growth. During COVID-19, the food and personal care industries experienced unprecedented fluctuations. During the severe period of the pandemic, several verticals were forced to embrace an e-commerce mode of business in their sales operation. This diversion from the retail business encouraged cosmetic players to adopt the online platform and increase their revenue. These frequent measures showed a massive demand for polylysine that again re-established post-pandemic. Consecutively, the ease in restrictions and removal of lockdown shifted the worst phase of the market to probable growth, deriving impeccable market opportunities for the polylysine market.

## Key Players Landscape and Outlook

The rising polylysine market has encouraged prominent companies to develop excellent food additives and cosmetic preservatives with prominent antimicrobial properties. The leading global companies in the polylysine market are progressively developing excellent polylysine that are benefitting food quality and extended shelf life. Jiangsu Yiming Biological Technology Co., Ltd. is a leading provider of natural food additives that is extensively engaged in bioengineering of food additives and ingredients. The company is successively involved in manufacturing food grade  $\gamma$ -Polylysines. They have various models of  $\gamma$ -Polylysines either in pure form or in combination, such as PL-01 99% purity  $\gamma$ -Polylysines, PL-02  $\gamma$ -Polylysines + Natamase, PL-03  $\gamma$ -Polylysines + Natamase + Glycine.

Jiangsu Yiming Biological Technology Co., Ltd. Has a massive factory area of 66000-meter square that deals with around 3000 tons annual output and its products are verified from eminent certifications like KOSHER, HALAL, ISO9001E, etc. The company's research and development (R&D) centre is in Wuxi, Jiangsu Province, where the research team comprises of more than 30 industrial elites. The company has significantly collaborated with Chinese universities and research institutions. In November 2023, Jiangsu Yiming Biological Technology Co., Ltd. attended the FIC Health Exhibition 203 in Guangzhou China Import Export Fair where it potentially represented its food additive products to encourage food companies.

## Contents

### 1. RESEARCH METHODOLOGY

### 2. PROJECT SCOPE & DEFINITIONS

### 3. IMPACT OF COVID-19 ON GLOBAL POLYLYSINE MARKET

### 4. EXECUTIVE SUMMARY

### 5. VOICE OF CUSTOMER

#### 5.1. Market Awareness and Product Information

#### 5.2. Brand Awareness and Loyalty

#### 5.3. Factors Considered in Purchase Decision

##### 5.3.1. Brand Name

##### 5.3.2. Quality

##### 5.3.3. Quantity

##### 5.3.4. Price

##### 5.3.5. Product Specification

##### 5.3.6. Application Specification

##### 5.3.7. VOC/Toxicity Content

##### 5.3.8. Availability of Product

#### 5.4. Frequency of Purchase

#### 5.5. Medium of Purchase

### 6. GLOBAL POLYLYSINE MARKET OUTLOOK, 2017-2031F

#### 6.1. Market Size & Forecast

##### 6.1.1. By Value

##### 6.1.2. By Volume

#### 6.2. By Product Type

##### 6.2.1. Powder

##### 6.2.2. Liquid

#### 6.3. By Grade

##### 6.3.1. Food Grade

##### 6.3.2. Pharma Grade

#### 6.4. By Application

##### 6.4.1. Preservative

- 6.4.2. Cell Attachment
- 6.4.3. Antimicrobial Effect
- 6.4.4. Others
- 6.5. By End-user
  - 6.5.1. Food & Beverage
  - 6.5.2. Cosmetics & Personal Care
  - 6.5.3. Pharmaceuticals
  - 6.5.4. Dietary Supplements
  - 6.5.5. Others
- 6.6. By Region
  - 6.6.1. North America
  - 6.6.2. Europe
  - 6.6.3. South America
  - 6.6.4. Asia-Pacific
  - 6.6.5. Middle East and Africa
- 6.7. By Company Market Share (%), 2023

## **7. GLOBAL POLYLYSINE MARKET OUTLOOK, BY REGION, 2017-2031F**

- 7.1. North America\*
  - 7.1.1. Market Size & Forecast
    - 7.1.1.1. By Value
    - 7.1.1.2. By Volume
  - 7.1.2. By Product Type
    - 7.1.2.1. Powder
    - 7.1.2.2. Liquid
  - 7.1.3. By Grade
    - 7.1.3.1. Food Grade
    - 7.1.3.2. Pharma Grade
  - 7.1.4. By Application
    - 7.1.4.1. Preservative
    - 7.1.4.2. Cell Attachment
    - 7.1.4.3. Antimicrobial Effect
    - 7.1.4.4. Others
  - 7.1.5. By End-user
    - 7.1.5.1. Food & Beverage
    - 7.1.5.2. Cosmetics & Personal Care
    - 7.1.5.3. Pharmaceuticals
    - 7.1.5.4. Dietary Supplements

7.1.5.5. Others

7.1.6. United States\*

7.1.6.1. Market Size & Forecast

7.1.6.1.1. By Value

7.1.6.1.2. By Volume

7.1.6.2. By Product Type

7.1.6.2.1. Powder

7.1.6.2.2. Liquid

7.1.6.3. By Grade

7.1.6.3.1. Food Grade

7.1.6.3.2. Pharma Grade

7.1.6.4. By Application

7.1.6.4.1. Preservative

7.1.6.4.2. Cell Attachment

7.1.6.4.3. Antimicrobial Effect

7.1.6.4.4. Others

7.1.6.5. By End-user

7.1.6.5.1. Food & Beverage

7.1.6.5.2. Cosmetics & Personal Care

7.1.6.5.3. Pharmaceuticals

7.1.6.5.4. Dietary Supplements

7.1.6.5.5. Others

\*All segments will be provided for all regions and countries covered

7.1.7. Canada

7.1.8. Mexico

7.2. Europe

7.2.1. Germany

7.2.2. France

7.2.3. Italy

7.2.4. United Kingdom

7.2.5. Russia

7.2.6. Netherlands

7.2.7. Spain

7.2.8. Turkey

7.2.9. Poland

7.3. South America

7.3.1. Brazil

7.3.2. Argentina

7.4. Asia-Pacific

- 7.4.1. India
- 7.4.2. China
- 7.4.3. Japan
- 7.4.4. Australia
- 7.4.5. Vietnam
- 7.4.6. South Korea
- 7.4.7. Indonesia
- 7.4.8. Philippines
- 7.5. Middle East & Africa
  - 7.5.1. Saudi Arabia
  - 7.5.2. UAE
  - 7.5.3. South Africa

## **8. SUPPLY SIDE ANALYSIS**

- 8.1. Capacity, By Company
- 8.2. Production, By Company
- 8.3. Operating Efficiency, By Company
- 8.4. Key Plant Locations (Up to 25)

## **9. MARKET MAPPING, 2023**

- 9.1. By Product Type
- 9.2. By Grade
- 9.3. By Application
- 9.4. By End-user
- 9.5. By Region

## **10. MACRO ENVIRONMENT AND INDUSTRY STRUCTURE**

- 10.1. Supply Demand Analysis
- 10.2. Import Export Analysis – Volume and Value
- 10.3. Supply/Value Chain Analysis
- 10.4. PESTEL Analysis
  - 10.4.1. Political Factors
  - 10.4.2. Economic System
  - 10.4.3. Social Implications
  - 10.4.4. Technological Advancements
  - 10.4.5. Environmental Impacts

- 10.4.6. Legal Compliances and Regulatory Policies (Statutory Bodies Included)
- 10.5. Porter's Five Forces Analysis
  - 10.5.1. Supplier Power
  - 10.5.2. Buyer Power
  - 10.5.3. Substitution Threat
  - 10.5.4. Threat from New Entrant
  - 10.5.5. Competitive Rivalry

## **11. MARKET DYNAMICS**

- 11.1. Growth Drivers
- 11.2. Growth Inhibitors (Challenges, Restraints)

## **12. KEY PLAYERS LANDSCAPE**

- 12.1. Competition Matrix of Top Five Market Leaders
- 12.2. Market Revenue Analysis of Top Five Market Leaders (in %, 2023)
- 12.3. Mergers and Acquisitions/Joint Ventures (If Applicable)
- 12.4. SWOT Analysis (For Five Market Players)
- 12.5. Patent Analysis (If Applicable)

## **13. PRICING ANALYSIS**

## **14. CASE STUDIES**

## **15. KEY PLAYERS OUTLOOK**

- 15.1. JNC Corporation
  - 15.1.1. Company Details
  - 15.1.2. Key Management Personnel
  - 15.1.3. Products & Services
  - 15.1.4. Financials (As reported)
  - 15.1.5. Key Market Focus & Geographical Presence
  - 15.1.6. Recent Developments
- 15.2. Chisso Corporation
- 15.3. Henan Daken Chemical Co.,Ltd
- 15.4. Bimal Pharma Pvt., Ltd.
- 15.5. Jiangsu Yiming Biological Technology Co., Ltd.
- 15.6. Advance Biomatrix

15.7. Siveele B.V., Breda

15.8. Zhengzhou Yizeli Industrial Co.,Ltd

15.9. IngreCore BV.

15.10. Iris Biotech GmbH

\*Companies mentioned above DO NOT hold any order as per market share and can be changed as per information available during research work.

## **16. STRATEGIC RECOMMENDATIONS**

## **17. ABOUT US & DISCLAIMER**

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