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Molecular Farming Market Forecasts to 2030 – Global Analysis By Type (Plant-Based, Animal-Based, and Other Types), Scale, Crop Source, Technology, Application, End User and By Geography

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Abstracts

According to Stratistics MRC, the Global Molecular Farming Market is accounted for $531.75 million in 2024 and is expected to reach $1371.03 million by 2030 growing at a CAGR of 17.1% during the forecast period. Molecular farming is the process of producing useful bioproducts including proteins, vaccines, enzymes, and biofuels by using genetically engineered plants, microbes, or algae. It offers a scalable and affordable substitute for conventional production techniques by introducing particular genes into organisms to allow them to synthesis desired chemicals. Molecular farming is being used more and more in the pharmaceutical, agricultural, and industrial sectors. It is promoting biotechnology advancements and helping to provide sustainable solutions for energy, food production, and medicine.

Market Dynamics:

Driver:

Growing demand for biopharmaceuticals

The need for biopharmaceuticals is growing along with the prevalence of chronic diseases like diabetes, cancer, and cardiovascular disorders. Biopharmaceuticals offer targeted and effective treatments, driving growth in the molecular farming market. Additionally, advancements in biotechnology and genetic engineering have made it possible to produce complex proteins and antibodies using plant-based systems. These systems are often more cost-effective and scalable compared to traditional methods.

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The growing biopharmaceutical market creates a favourable environment for molecular farming technologies to thrive.

Restraint:

High initial investment

Molecular farming enterprises involve a large initial investment in infrastructure, machinery, and technology. This high initial cost can be a significant barrier for new entrants and smaller companies. Additionally, the regulatory approval process for biopharmaceuticals produced through molecular farming can be lengthy and expensive. Companies must also invest in research and development to optimize production processes and ensure product quality. These financial challenges can hinder the growth and expansion of the molecular farming market.

Opportunity:

Rising demand for plant-based proteins

Consumer preferences are shifting towards plant-based diets, driven by health, environmental, and ethical considerations. This trend has led to a growing demand for plant-based proteins, which are seen as sustainable and healthy alternatives to animal-based products. Molecular farming offers a promising solution to meet this demand by producing high-quality plant-based proteins. Additionally, advancements in genetic engineering enable the production of customized proteins with specific nutritional and functional properties. The increasing popularity of plant-based diets presents a significant growth opportunity for the molecular farming market.

Threat:

Vulnerability to environmental factors

Agricultural systems that are susceptible to environmental factors including pests, diseases, and climate change are the basis of molecular farming operations. These factors can impact crop yields, product quality, and overall productivity. For example, extreme weather events such as droughts or floods can devastate crops and disrupt production. Additionally, pests and diseases can spread rapidly and cause significant damage to plants. Mitigating these risks requires robust agricultural practices, investment in resilient crop varieties, and effective pest and disease management

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strategies.

Covid-19 Impact

The COVID-19 pandemic has had a profound impact on the molecular farming market. The pandemic has highlighted the importance of biopharmaceuticals and accelerated the development of new therapies and vaccines. Molecular farming has gained attention as a potential platform for producing biopharmaceuticals quickly and efficiently. Additionally, the pandemic has spurred investment in biotechnology and healthcare infrastructure, creating opportunities for molecular farming technologies. However, supply chain disruptions and logistical challenges during the pandemic have also posed obstacles for the market.

The plant-based segment is expected to be the largest during the forecast period

The plant-based segment is expected to account for the largest market share during the forecast period, due to the increasing consumer preference for sustainable and healthy food products. Plant-based proteins produced through molecular farming offer a viable alternative to traditional animal-based proteins. Additionally, the environmental benefits of plant-based proteins, such as reduced greenhouse gas emissions and lower resource usage, further drive their popularity. The growing awareness of health and environmental issues supports the expansion of the plant-based segment in the molecular farming market.

The pharmaceuticals segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the pharmaceuticals segment is predicted to witness the highest growth rate, due to the rising need for innovative and cost-effective drugs, vaccines, and therapeutic proteins produced through molecular farming. Furthermore, molecular farming allows for the rapid production of therapeutic proteins in response to emerging health threats. The pharmaceutical industry's focus on developing new treatments for various diseases, including infectious diseases and chronic conditions, drives the demand for molecular farming technologies.

Region with largest share:

During the forecast period, Asia Pacific region is expected to hold the largest market share, due to the region's large population and increasing healthcare expenditure drive

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the demand for advanced biopharmaceuticals. Additionally, government initiatives to support healthcare and medical research contribute to the market's growth. The presence of a robust biotechnology industry and ongoing investments in R&D further bolster the molecular farming market in the Asia Pacific region. As the region continues to develop, the demand for biopharmaceuticals is expected to increase, making it a crucial market for molecular farming technologies.

Region with highest CAGR:

Over the forecast period, the North America region is anticipated to exhibit the highest CAGR, owing to a developed healthcare infrastructure, a growing senior population. The increasing incidence of neurodegenerative illnesses like ALS and Alzheimer's in the area has raised the need for precise and sensitive biomarkers like NfL. Furthermore, the development and marketing of NfL-based diagnostic tests and therapeutic interventions have been expedited by the presence of prominent pharmaceutical and biotechnology firms in North America.

Key players in the market

Some of the key players profiled in the Molecular Farming Market include Syngenta AG, Monsanto, Corteva Agriscience, Medicago Inc., SAB Biotherapeutics, Zymergen, Mapp Biopharmaceuticals, Ventria Bioscience, ArcelorMittal, GreenGate Biotech, Evonik Industries, NexBio, BASF SE, Tobacco Biotechnology Company (TBC), and Kirin Holdings Company, Ltd.

Key Developments:

In November 2024, McDonald’s USA, syngenta and lopez foods collaborate to help produce beef more sustainably in the US, Syngenta, McDonald’s and Lopez Foods announce collaboration aimed at helping to reduce certain environmental impacts during beef production.

In November 2024, Corteva Inc. announced a collaboration with bp on the companies’ shared intent to form a crop-based biofuel feedstock joint venture (JV). The JV envisaged by Corteva and bp would produce and deliver crop-based biofuel feedstocks to help meet the anticipated growth in demand for ‘sustainable aviation fuel’ (SAF).

Types Covered:

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Plant-Based

Animal-Based

Other Types

Scales Covered:

Pilot-Scale Production

Lab-Scale Production

Commercial-Scale Production

Crop Sources Covered:

Maize

Barley

Tobacco

Safflower

Rice

Alfalfa

Other Crop Sources

Technologies Covered:

RNA Interference (RNAi)

Agrobacterium-Mediated Gene Transfer

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Transgenic Plants

Agroinfiltration

Electroporation

Other Technologies

Applications Covered:

Food & Feed

Industrial Enzymes

Nutraceuticals

Dairy

Other Applications

End Users Covered:

Agricultural Industry

Biotechnology & Pharmaceutical Companies

Research Institutions & Academia

Contract Manufacturing Organizations (CMOs)

Other End Users

Regions Covered:

North America

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- US
- Canada
- Mexico

Europe

- Germany
- UK
- Italy
- France
- Spain
- Rest of Europe

Asia Pacific

- Japan
- China
- India
- Australia
- New Zealand
- South Korea
- Rest of Asia Pacific

South America

- Argentina

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- Brazil
- Chile
- Rest of South America

Middle East & Africa

- Saudi Arabia
- UAE
- Qatar
- South Africa
- Rest of Middle East & Africa

What our report offers:
- Market share assessments for the regional and country-level segments
- Strategic recommendations for the new entrants
- Covers Market data for the years 2022, 2023, 2024, 2026, and 2030
- Market Trends (Drivers, Constraints, Opportunities, Threats, Challenges, Investment Opportunities, and recommendations)
- Strategic recommendations in key business segments based on the market estimations
- Competitive landscaping mapping the key common trends
- Company profiling with detailed strategies, financials, and recent developments
- Supply chain trends mapping the latest technological advancements

Free Customization Offerings:

All the customers of this report will be entitled to receive one of the following free customization options:

- Company Profiling

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Comprehensive profiling of additional market players (up to 3)

SWOT Analysis of key players (up to 3)

Regional Segmentation

Market estimations, Forecasts and CAGR of any prominent country as per the client's interest (Note: Depends on feasibility check)

Competitive Benchmarking

Benchmarking of key players based on product portfolio, geographical presence, and strategic alliances

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Note: Tables for North America, Europe, APAC, South America, and Middle East & Africa Regions are also represented in the same manner as above.

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