

# **Global Protein Hydrolysis Enzymes Market Size study & Forecast, by Product (Animal Product, Plant Product, Microbial Product), by Application (Detergents, Pharmaceuticals, Food, Textiles & Leather, Other Applications), by Source (Microorganisms, Animals, Plants) and Regional Analysis, 2022-2029**

<https://marketpublishers.com/r/G02DEEEBFBDFFEN.html>

Date: January 2023

Pages: 200

Price: US\$ 4,950.00 (Single User License)

ID: G02DEEEBFBDFFEN

## **Abstracts**

Global Protein Hydrolysis Enzymes Market is valued at approximately USD 8.5 billion in 2021 and is anticipated to grow with a healthy growth rate of more than 6.9% over the forecast period 2022-2029. Protein hydrolysis is a method of the breakdown of proteins into smaller peptides and amino acids. The protein hydrolysis enzymes focus on breaking down the peptide bonds and boosting the free amino acid and carboxyl groups, which is generally used commercially to simulate the hydrolytic process. The rising consumption of protein, growing health awareness among the population, and high usage in the food sector coupled with the increase in the incidence of chronic diseases are the key factors that are fostering market growth across the globe.

In addition, the surging demand for protein hydrolysis enzymes in applications such as detergents, pharmaceuticals, food, textiles & leather, and other applications is further witnessing the rapid growth of the market. According to Statista, in the United States, the total R&D expenditure in the pharmaceutical industry was recorded at USD 83 billion, which is anticipated to grow and reach USD 102.3 billion in 2021. Likewise, the India Brand Equity Foundation (IBEF) reported that the Indian pharmaceutical market was worth around USD 42 billion in 2021. Also, it is expected that the market flourishingly grows and is likely to reach USD 130 billion by 2030. Thereby, the thriving development of the pharmaceutical industry is stipulating the demand for protein

hydrolysis enzymes to control the spreading of infectious diseases, which, in turn, augments the market growth. Moreover, the rise in demand for natural and environment-friendly products, as well as the low cost of labeling solutions are anticipated to leverage various opportunities over the forthcoming years. However, the side effects associated with certain proteases and varying government regulations and standards are restricting the market growth throughout the forecast period of 2022-2029.

The key regions considered for the Global Protein Hydrolysis Enzymes Market study include Asia Pacific, North America, Europe, Latin America, and the Rest of the World. The Asia Pacific dominated the market in terms of revenue, owing to the growing demand for meat and fortified foods, along with the rising technological advancements in protease enzymes. Whereas, the Asia Pacific is also expected to grow with the highest CAGR during the forecast period, owing to factors such as rising target populations, thriving growth of end-use industries, and active participation of government and nonprofit organizations in the market space.

Major market players included in this report are:

Novozymes

Associated British Foods

DSM

DuPont

BASF

Advanced Enzymes Technologies

Chr. Hansen

Dyadic International

Amano Enzymes

Specialty Enzymes & Biotechnologies

Recent Developments in the Market:

In April 2021, Biocatalysts unveils the introduction of a new enzyme product with the objective of strengthening the range in the dairy protein market. This novel enzyme is specifically designed to be used for Casein Hydrolysis.

In November 2021, Biocatalysts announced that the company introduced its new product named “Promod 324L” for the pet food industry.

Global Protein Hydrolysis Enzymes Market Report Scope:

Historical Data 2019-2020-2021

Base Year for Estimation 2021

Forecast period 2022-2029

Report Coverage Revenue forecast, Company Ranking, Competitive Landscape, Growth factors, and Trends

Segments Covered Product, Application, Source, Region

Regional Scope North America; Europe; Asia Pacific; Latin America; Rest of the World

Customization Scope Free report customization (equivalent up to 8 analyst's working hours) with purchase. Addition or alteration to country, regional & segment scope\*

The objective of the study is to define market sizes of different segments & countries in recent years and to forecast the values to the coming years. The report is designed to incorporate both qualitative and quantitative aspects of the industry within countries involved in the study.

The report also caters detailed information about the crucial aspects such as driving factors & challenges which will define the future growth of the market. Additionally, it also incorporates potential opportunities in micro markets for stakeholders to invest along with the detailed analysis of competitive landscape and product offerings of key players. The detailed segments and sub-segment of the market are explained below:

By Product:

Animal Product

Plant Product

Microbial Product

By Application:

Detergents

Pharmaceuticals

Food

Textiles & Leather

Other Applications

By Source:

Microorganisms

Animals

Plants

By Region:

North America

U.S.

Canada  
Europe  
UK  
Germany  
France  
Spain  
Italy  
ROE  
Asia Pacific  
China  
India  
Japan  
Australia  
South Korea  
RoAPAC  
Latin America  
Brazil  
Mexico  
RoLA  
Rest of the World

## Contents

### CHAPTER 1. EXECUTIVE SUMMARY

- 1.1. Market Snapshot
- 1.2. Global & Segmental Market Estimates & Forecasts, 2019-2029 (USD Billion)
  - 1.2.1. Protein Hydrolysis Enzymes Market, by Region, 2019-2029 (USD Billion)
  - 1.2.2. Protein Hydrolysis Enzymes Market, by Product, 2019-2029 (USD Billion)
  - 1.2.3. Protein Hydrolysis Enzymes Market, by Application, 2019-2029 (USD Billion)
  - 1.2.4. Protein Hydrolysis Enzymes Market, by Source, 2019-2029 (USD Billion)
- 1.3. Key Trends
- 1.4. Estimation Methodology
- 1.5. Research Assumption

### CHAPTER 2. GLOBAL PROTEIN HYDROLYSIS ENZYMES MARKET DEFINITION AND SCOPE

- 2.1. Objective of the Study
- 2.2. Market Definition & Scope
  - 2.2.1. Scope of the Study
  - 2.2.2. Industry Evolution
- 2.3. Years Considered for the Study
- 2.4. Currency Conversion Rates

### CHAPTER 3. GLOBAL PROTEIN HYDROLYSIS ENZYMES MARKET DYNAMICS

- 3.1. Protein Hydrolysis Enzymes Market Impact Analysis (2019-2029)
  - 3.1.1. Market Drivers
    - 3.1.1.1. Growing health awareness among the population
    - 3.1.1.2. Surging demand for protein hydrolysis enzymes in various applications
  - 3.1.2. Market Challenges
    - 3.1.2.1. Side effects associated with certain proteases
    - 3.1.2.2. Varying government regulations and standards
  - 3.1.3. Market Opportunities
    - 3.1.3.1. Rise in demand for natural and environment-friendly products
    - 3.1.3.2. Low-cost of labeling solutions

### CHAPTER 4. GLOBAL PROTEIN HYDROLYSIS ENZYMES MARKET INDUSTRY ANALYSIS

- 4.1. Porter's 5 Force Model
  - 4.1.1. Bargaining Power of Suppliers
  - 4.1.2. Bargaining Power of Buyers
  - 4.1.3. Threat of New Entrants
  - 4.1.4. Threat of Substitutes
  - 4.1.5. Competitive Rivalry
- 4.2. Futuristic Approach to Porter's 5 Force Model (2019-2029)
- 4.3. PEST Analysis
  - 4.3.1. Political
  - 4.3.2. Economical
  - 4.3.3. Social
  - 4.3.4. Technological
- 4.4. Top investment opportunity
- 4.5. Top winning strategies
- 4.6. Industry Experts Prospective
- 4.7. Analyst Recommendation & Conclusion

## **CHAPTER 5. RISK ASSESSMENT: COVID-19 IMPACT**

- 5.1. Assessment of the overall impact of COVID-19 on the industry
- 5.2. Pre COVID-19 and post COVID-19 Market scenario

## **CHAPTER 6. GLOBAL PROTEIN HYDROLYSIS ENZYMES MARKET, BY PRODUCT**

- 6.1. Market Snapshot
- 6.2. Global Protein Hydrolysis Enzymes Market by Product, Performance - Potential Analysis
- 6.3. Global Protein Hydrolysis Enzymes Market Estimates & Forecasts by Product 2019-2029 (USD Billion)
- 6.4. Protein Hydrolysis Enzymes Market, Sub Segment Analysis
  - 6.4.1. Animal Product
  - 6.4.2. Plant Product
  - 6.4.3. Microbial Product

## **CHAPTER 7. GLOBAL PROTEIN HYDROLYSIS ENZYMES MARKET, BY APPLICATION**

- 7.1. Market Snapshot

7.2. Global Protein Hydrolysis Enzymes Market by Application, Performance - Potential Analysis

7.3. Global Protein Hydrolysis Enzymes Market Estimates & Forecasts by Application 2019-2029 (USD Billion)

7.4. Protein Hydrolysis Enzymes Market, Sub Segment Analysis

7.4.1. Detergents

7.4.2. Pharmaceuticals

7.4.3. Food

7.4.4. Textiles & Leather

7.4.5. Other Applications

## **CHAPTER 8. GLOBAL PROTEIN HYDROLYSIS ENZYMES MARKET, BY SOURCE**

8.1. Market Snapshot

8.2. Global Protein Hydrolysis Enzymes Market by Source, Performance - Potential Analysis

8.3. Global Protein Hydrolysis Enzymes Market Estimates & Forecasts by Source 2019-2029 (USD Billion)

8.4. Protein Hydrolysis Enzymes Market, Sub Segment Analysis

8.4.1. Microorganisms

8.4.2. Animals

8.4.3. Plants

## **CHAPTER 9. GLOBAL PROTEIN HYDROLYSIS ENZYMES MARKET, REGIONAL ANALYSIS**

9.1. Protein Hydrolysis Enzymes Market, Regional Market Snapshot

9.2. North America Protein Hydrolysis Enzymes Market

9.2.1. U.S. Protein Hydrolysis Enzymes Market

9.2.1.1. Product breakdown estimates & forecasts, 2019-2029

9.2.1.2. Application breakdown estimates & forecasts, 2019-2029

9.2.1.3. Source breakdown estimates & forecasts, 2019-2029

9.2.2. Canada Protein Hydrolysis Enzymes Market

9.3. Europe Protein Hydrolysis Enzymes Market Snapshot

9.3.1. U.K. Protein Hydrolysis Enzymes Market

9.3.2. Germany Protein Hydrolysis Enzymes Market

9.3.3. France Protein Hydrolysis Enzymes Market

9.3.4. Spain Protein Hydrolysis Enzymes Market

9.3.5. Italy Protein Hydrolysis Enzymes Market

- 9.3.6. Rest of Europe Protein Hydrolysis Enzymes Market
- 9.4. Asia-Pacific Protein Hydrolysis Enzymes Market Snapshot
  - 9.4.1. China Protein Hydrolysis Enzymes Market
  - 9.4.2. India Protein Hydrolysis Enzymes Market
  - 9.4.3. Japan Protein Hydrolysis Enzymes Market
  - 9.4.4. Australia Protein Hydrolysis Enzymes Market
  - 9.4.5. South Korea Protein Hydrolysis Enzymes Market
  - 9.4.6. Rest of Asia Pacific Protein Hydrolysis Enzymes Market
- 9.5. Latin America Protein Hydrolysis Enzymes Market Snapshot
  - 9.5.1. Brazil Protein Hydrolysis Enzymes Market
  - 9.5.2. Mexico Protein Hydrolysis Enzymes Market
  - 9.5.3. Rest of Latin America Protein Hydrolysis Enzymes Market
- 9.6. Rest of The World Protein Hydrolysis Enzymes Market

## **CHAPTER 10. COMPETITIVE INTELLIGENCE**

- 10.1. Top Market Strategies
- 10.2. Company Profiles
  - 10.2.1. Novozymes
    - 10.2.1.1. Key Information
    - 10.2.1.2. Overview
    - 10.2.1.3. Financial (Subject to Data Availability)
    - 10.2.1.4. Product Summary
    - 10.2.1.5. Recent Developments
  - 10.2.2. Associated British Foods
  - 10.2.3. DSM
  - 10.2.4. DuPont
  - 10.2.5. BASF
  - 10.2.6. Advanced Enzymes Technologies
  - 10.2.7. Chr. Hansen
  - 10.2.8. Dyadic International
  - 10.2.9. Amano Enzymes
  - 10.2.10. Specialty Enzymes & Biotechnologies

## **CHAPTER 11. RESEARCH PROCESS**

- 11.1. Research Process
  - 11.1.1. Data Mining
  - 11.1.2. Analysis



- 11.1.3. Market Estimation
- 11.1.4. Validation
- 11.1.5. Publishing
- 11.2. Research Attributes
- 11.3. Research Assumption

## List Of Tables

### LIST OF TABLES

TABLE 1. Global Protein Hydrolysis Enzymes Market, report scope

TABLE 2. Global Protein Hydrolysis Enzymes Market estimates & forecasts by Region 2019-2029 (USD Billion)

TABLE 3. Global Protein Hydrolysis Enzymes Market estimates & forecasts by Product 2019-2029 (USD Billion)

TABLE 4. Global Protein Hydrolysis Enzymes Market estimates & forecasts by Application 2019-2029 (USD Billion)

TABLE 5. Global Protein Hydrolysis Enzymes Market estimates & forecasts by Source 2019-2029 (USD Billion)

TABLE 6. Global Protein Hydrolysis Enzymes Market by segment, estimates & forecasts, 2019-2029 (USD Billion)

TABLE 7. Global Protein Hydrolysis Enzymes Market by region, estimates & forecasts, 2019-2029 (USD Billion)

TABLE 8. Global Protein Hydrolysis Enzymes Market by segment, estimates & forecasts, 2019-2029 (USD Billion)

TABLE 9. Global Protein Hydrolysis Enzymes Market by region, estimates & forecasts, 2019-2029 (USD Billion)

TABLE 10. Global Protein Hydrolysis Enzymes Market by segment, estimates & forecasts, 2019-2029 (USD Billion)

TABLE 11. Global Protein Hydrolysis Enzymes Market by region, estimates & forecasts, 2019-2029 (USD Billion)

TABLE 12. Global Protein Hydrolysis Enzymes Market by segment, estimates & forecasts, 2019-2029 (USD Billion)

TABLE 13. Global Protein Hydrolysis Enzymes Market by region, estimates & forecasts, 2019-2029 (USD Billion)

TABLE 14. Global Protein Hydrolysis Enzymes Market by segment, estimates & forecasts, 2019-2029 (USD Billion)

TABLE 15. Global Protein Hydrolysis Enzymes Market by region, estimates & forecasts, 2019-2029 (USD Billion)

TABLE 16. U.S. Protein Hydrolysis Enzymes Market estimates & forecasts, 2019-2029 (USD Billion)

TABLE 17. U.S. Protein Hydrolysis Enzymes Market estimates & forecasts by segment 2019-2029 (USD Billion)

TABLE 18. U.S. Protein Hydrolysis Enzymes Market estimates & forecasts by segment 2019-2029 (USD Billion)

TABLE 19. Canada Protein Hydrolysis Enzymes Market estimates & forecasts, 2019-2029 (USD Billion)

TABLE 20. Canada Protein Hydrolysis Enzymes Market estimates & forecasts by segment 2019-2029 (USD Billion)

TABLE 21. Canada Protein Hydrolysis Enzymes Market estimates & forecasts by segment 2019-2029 (USD Billion)

TABLE 22. UK Protein Hydrolysis Enzymes Market estimates & forecasts, 2019-2029 (USD Billion)

TABLE 23. UK Protein Hydrolysis Enzymes Market estimates & forecasts by segment 2019-2029 (USD Billion)

TABLE 24. UK Protein Hydrolysis Enzymes Market estimates & forecasts by segment 2019-2029 (USD Billion)

TABLE 25. Germany Protein Hydrolysis Enzymes Market estimates & forecasts, 2019-2029 (USD Billion)

TABLE 26. Germany Protein Hydrolysis Enzymes Market estimates & forecasts by segment 2019-2029 (USD Billion)

TABLE 27. Germany Protein Hydrolysis Enzymes Market estimates & forecasts by segment 2019-2029 (USD Billion)

TABLE 28. France Protein Hydrolysis Enzymes Market estimates & forecasts, 2019-2029 (USD Billion)

TABLE 29. France Protein Hydrolysis Enzymes Market estimates & forecasts by segment 2019-2029 (USD Billion)

TABLE 30. France Protein Hydrolysis Enzymes Market estimates & forecasts by segment 2019-2029 (USD Billion)

TABLE 31. Italy Protein Hydrolysis Enzymes Market estimates & forecasts, 2019-2029 (USD Billion)

TABLE 32. Italy Protein Hydrolysis Enzymes Market estimates & forecasts by segment 2019-2029 (USD Billion)

TABLE 33. Italy Protein Hydrolysis Enzymes Market estimates & forecasts by segment 2019-2029 (USD Billion)

TABLE 34. Spain Protein Hydrolysis Enzymes Market estimates & forecasts, 2019-2029 (USD Billion)

TABLE 35. Spain Protein Hydrolysis Enzymes Market estimates & forecasts by segment 2019-2029 (USD Billion)

TABLE 36. Spain Protein Hydrolysis Enzymes Market estimates & forecasts by segment 2019-2029 (USD Billion)

TABLE 37. RoE Protein Hydrolysis Enzymes Market estimates & forecasts, 2019-2029 (USD Billion)

TABLE 38. RoE Protein Hydrolysis Enzymes Market estimates & forecasts by segment

2019-2029 (USD Billion)

TABLE 39. RoE Protein Hydrolysis Enzymes Market estimates & forecasts by segment  
2019-2029 (USD Billion)

TABLE 40. China Protein Hydrolysis Enzymes Market estimates & forecasts, 2019-2029  
(USD Billion)

TABLE 41. China Protein Hydrolysis Enzymes Market estimates & forecasts by  
segment 2019-2029 (USD Billion)

TABLE 42. China Protein Hydrolysis Enzymes Market estimates & forecasts by  
segment 2019-2029 (USD Billion)

TABLE 43. India Protein Hydrolysis Enzymes Market estimates & forecasts, 2019-2029  
(USD Billion)

TABLE 44. India Protein Hydrolysis Enzymes Market estimates & forecasts by segment  
2019-2029 (USD Billion)

TABLE 45. India Protein Hydrolysis Enzymes Market estimates & forecasts by segment  
2019-2029 (USD Billion)

TABLE 46. Japan Protein Hydrolysis Enzymes Market estimates & forecasts,  
2019-2029 (USD Billion)

TABLE 47. Japan Protein Hydrolysis Enzymes Market estimates & forecasts by  
segment 2019-2029 (USD Billion)

TABLE 48. Japan Protein Hydrolysis Enzymes Market estimates & forecasts by  
segment 2019-2029 (USD Billion)

TABLE 49. South Korea Protein Hydrolysis Enzymes Market estimates & forecasts,  
2019-2029 (USD Billion)

TABLE 50. South Korea Protein Hydrolysis Enzymes Market estimates & forecasts by  
segment 2019-2029 (USD Billion)

TABLE 51. South Korea Protein Hydrolysis Enzymes Market estimates & forecasts by  
segment 2019-2029 (USD Billion)

TABLE 52. Australia Protein Hydrolysis Enzymes Market estimates & forecasts,  
2019-2029 (USD Billion)

TABLE 53. Australia Protein Hydrolysis Enzymes Market estimates & forecasts by  
segment 2019-2029 (USD Billion)

TABLE 54. Australia Protein Hydrolysis Enzymes Market estimates & forecasts by  
segment 2019-2029 (USD Billion)

TABLE 55. RoAPAC Protein Hydrolysis Enzymes Market estimates & forecasts,  
2019-2029 (USD Billion)

TABLE 56. RoAPAC Protein Hydrolysis Enzymes Market estimates & forecasts by  
segment 2019-2029 (USD Billion)

TABLE 57. RoAPAC Protein Hydrolysis Enzymes Market estimates & forecasts by  
segment 2019-2029 (USD Billion)

TABLE 58. Brazil Protein Hydrolysis Enzymes Market estimates & forecasts, 2019-2029 (USD Billion)

TABLE 59. Brazil Protein Hydrolysis Enzymes Market estimates & forecasts by segment 2019-2029 (USD Billion)

TABLE 60. Brazil Protein Hydrolysis Enzymes Market estimates & forecasts by segment 2019-2029 (USD Billion)

TABLE 61. Mexico Protein Hydrolysis Enzymes Market estimates & forecasts, 2019-2029 (USD Billion)

TABLE 62. Mexico Protein Hydrolysis Enzymes Market estimates & forecasts by segment 2019-2029 (USD Billion)

TABLE 63. Mexico Protein Hydrolysis Enzymes Market estimates & forecasts by segment 2019-2029 (USD Billion)

TABLE 64. RoLA Protein Hydrolysis Enzymes Market estimates & forecasts, 2019-2029 (USD Billion)

TABLE 65. RoLA Protein Hydrolysis Enzymes Market estimates & forecasts by segment 2019-2029 (USD Billion)

TABLE 66. RoLA Protein Hydrolysis Enzymes Market estimates & forecasts by segment 2019-2029 (USD Billion)

TABLE 67. Row Protein Hydrolysis Enzymes Market estimates & forecasts, 2019-2029 (USD Billion)

TABLE 68. Row Protein Hydrolysis Enzymes Market estimates & forecasts by segment 2019-2029 (USD Billion)

TABLE 69. Row Protein Hydrolysis Enzymes Market estimates & forecasts by segment 2019-2029 (USD Billion)

TABLE 70. List of secondary sources, used in the study of global Protein Hydrolysis Enzymes Market

TABLE 71. List of primary sources, used in the study of global Protein Hydrolysis Enzymes Market

TABLE 72. Years considered for the study

TABLE 73. Exchange rates considered

List of tables and figures and dummy in nature, final lists may vary in the final deliverable

## List Of Figures

### LIST OF FIGURES

- FIG 1. Global Protein Hydrolysis Enzymes Market, research methodology
  - FIG 2. Global Protein Hydrolysis Enzymes Market, Market estimation techniques
  - FIG 3. Global Market size estimates & forecast methods
  - FIG 4. Global Protein Hydrolysis Enzymes Market, key trends 2021
  - FIG 5. Global Protein Hydrolysis Enzymes Market, growth prospects 2022-2029
  - FIG 6. Global Protein Hydrolysis Enzymes Market, porters 5 force model
  - FIG 7. Global Protein Hydrolysis Enzymes Market, pest analysis
  - FIG 8. Global Protein Hydrolysis Enzymes Market, value chain analysis
  - FIG 9. Global Protein Hydrolysis Enzymes Market by segment, 2019 & 2029 (USD Billion)
  - FIG 10. Global Protein Hydrolysis Enzymes Market by segment, 2019 & 2029 (USD Billion)
  - FIG 11. Global Protein Hydrolysis Enzymes Market by segment, 2019 & 2029 (USD Billion)
  - FIG 12. Global Protein Hydrolysis Enzymes Market by segment, 2019 & 2029 (USD Billion)
  - FIG 13. Global Protein Hydrolysis Enzymes Market by segment, 2019 & 2029 (USD Billion)
  - FIG 14. Global Protein Hydrolysis Enzymes Market, regional snapshot 2019 & 2029
  - FIG 15. North America Protein Hydrolysis Enzymes Market 2019 & 2029 (USD Billion)
  - FIG 16. Europe Protein Hydrolysis Enzymes Market 2019 & 2029 (USD Billion)
  - FIG 17. Asia Pacific Protein Hydrolysis Enzymes Market 2019 & 2029 (USD Billion)
  - FIG 18. Latin America Protein Hydrolysis Enzymes Market 2019 & 2029 (USD Billion)
  - FIG 19. Global Protein Hydrolysis Enzymes Market, company Market share analysis (2021)
- List of tables and figures and dummy in nature, final lists may vary in the final deliverable



## I would like to order

Product name: Global Protein Hydrolysis Enzymes Market Size study & Forecast, by Product (Animal Product, Plant Product, Microbial Product), by Application (Detergents, Pharmaceuticals, Food, Textiles & Leather, Other Applications), by Source (Microorganisms, Animals, Plants) and Regional Analysis, 2022-2029

Product link: <https://marketpublishers.com/r/G02DEEEBFBDFFEN.html>

Price: US\$ 4,950.00 (Single User License / Electronic Delivery)

If you want to order Corporate License or Hard Copy, please, contact our Customer Service:

[info@marketpublishers.com](mailto:info@marketpublishers.com)

## Payment

To pay by Credit Card (Visa, MasterCard, American Express, PayPal), please, click button on product page <https://marketpublishers.com/r/G02DEEEBFBDFFEN.html>

To pay by Wire Transfer, please, fill in your contact details in the form below:

First name:

Last name:

Email:

Company:

Address:

City:

Zip code:

Country:

Tel:

Fax:

Your message:

**\*\*All fields are required**

Customer signature \_\_\_\_\_

Please, note that by ordering from marketpublishers.com you are agreeing to our Terms & Conditions at <https://marketpublishers.com/docs/terms.html>



To place an order via fax simply print this form, fill in the information below  
and fax the completed form to +44 20 7900 3970