

Pharmaceutical Gelatin Market – United States Industry Size, Share, Trends, Opportunity, and Forecast, 2018-2028 Segmented By Type (Type A, Type B), By Source (Porcine, Bovine Skin, Bovine Bone, Fish, Poultry), By Function (Stabilizing, Thickening, Gelling, others), By End-Users (Hard Capsule, Soft Capsule, Tablet, Absorbable Hemostat, others), by region, and Competition

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Abstracts

United States Pharmaceutical Gelatin Market is anticipated to witness an impressive growth in the forecast period. Pharmaceutical gelatin is a specialized type of gelatin that is produced and processed to meet strict quality and safety standards for use in the pharmaceutical industry. It is a critical excipient (inactive ingredient) in various pharmaceutical and medical applications. Pharmaceutical gelatin is typically derived from the collagen found in the connective tissues, skin, and bones of animals, such as cattle (bovine) or pigs (porcine). The choice of source may depend on factors like regional preferences and regulatory requirements. The production of pharmaceutical gelatin involves a series of controlled processes, including extraction, purification, and sterilization, to ensure the highest quality and safety standards are met. These processes eliminate impurities and potential contaminants. Pharmaceutical-grade gelatin is manufactured to be free from harmful substances, including pathogens, heavy metals, and allergens. It undergoes rigorous testing to ensure it meets pharmacopoeial standards for safety and purity. Pharmaceutical gelatin is biocompatible, meaning it is well-tolerated by the human body and does not elicit adverse reactions when used in pharmaceutical formulations.

The pharmaceutical industry is continuously expanding due to increasing healthcare needs and advancements in drug development. This growth drives the demand for pharmaceutical-grade gelatin used in various drug formulations. An aging United States population is associated with a higher incidence of chronic diseases and the need for pharmaceutical treatments. Gelatin-based capsules and drug delivery systems are commonly used for geriatric patients, boosting the demand for pharmaceutical gelatin. Gelatin capsules are often preferred by consumers due to their ease of swallowing, digestibility, and versatility. This consumer preference drives the use of gelatin in various pharmaceutical products. Advances in biopharmaceuticals and biotechnology lead to new drug formulations that often rely on gelatin for drug delivery, stabilization, and encapsulation. Gelatin is highly customizable in terms of size, shape, and color, allowing pharmaceutical companies to differentiate their products and meet specific patient preferences and therapeutic requirements.

Key Market Drivers

Growing Pharmaceutical Industry

Gelatin is a versatile excipient used in various drug formulations. It is commonly employed in the production of gelatin capsules (both soft and hard capsules), which are popular dosage forms for oral medications. As the pharmaceutical industry develops and manufactures a wide range of drugs and treatments, there is a consistent need for gelatin to encapsulate and deliver these drugs to patients. Gelatin plays a crucial role in drug delivery systems. It can be used to control the release of active pharmaceutical ingredients (APIs) from capsules or tablets, ensuring precise dosage administration. This is particularly important for controlled-release and extended-release formulations. Gelatin helps protect the stability and integrity of pharmaceutical formulations. It acts as a barrier against environmental factors such as moisture, oxygen, and light, which can degrade drugs. As pharmaceutical companies develop more sensitive drugs and biopharmaceuticals, the demand for protective gelatin-based formulations grows.

Gelatin capsules are preferred by many consumers due to their ease of swallowing, digestibility, and lack of taste or odor. This preference drives pharmaceutical companies to use gelatin as a preferred delivery method for medications and supplements. Regulatory agencies such as the U.S. Food and Drug Administration (FDA) and the European Medicines Agency (EMA) have strict standards for excipients used in pharmaceuticals. Gelatin suppliers must meet these quality and safety standards, ensuring that pharmaceutical-grade gelatin is used in drug products. Gelatin can be customized in terms of size, shape, and color, allowing pharmaceutical manufacturers

to tailor their products to meet specific patient preferences and therapeutic requirements. Advances in biopharmaceuticals and biotechnology have led to the development of new drug formulations that often rely on gelatin for drug delivery, encapsulation, and stabilization. Emerging economies with expanding healthcare access and pharmaceutical manufacturing capabilities have contributed to the increasing demand for gelatin in pharmaceuticals. This factor will help in the development of the United States Pharmaceutical Gelatin Market.

Biopharmaceutical Advancements

Biopharmaceutical advancements have had a notable impact on the use of pharmaceutical gelatin. Gelatin, a protein-based excipient, plays various roles in the development and delivery of biopharmaceutical products. Gelatin is used in the formulation of biopharmaceuticals, including monoclonal antibodies, vaccines, and other biologics. Gelatin can serve as a stabilizing agent, helping to maintain the stability and solubility of these complex molecules during storage and administration.

Biopharmaceuticals are often large, complex proteins that require specialized drug delivery systems. Gelatin can be used in the production of microspheres, nanoparticles, or drug-loaded gels to encapsulate and deliver protein-based drugs. This ensures controlled release and enhanced bioavailability of the therapeutic molecules. Gelatin has been used in the encapsulation of vaccines, including certain viral vaccines and protein subunit vaccines. It can help protect the vaccine antigens from degradation, enhance their stability, and facilitate their controlled release during vaccination.

In the field of regenerative medicine and tissue engineering, gelatin-based hydrogels are used as scaffolds for the growth of cells and tissues. These hydrogels provide a biocompatible environment for cell culture, making them valuable tools for biopharmaceutical research and tissue engineering applications. Gelatin nanoparticles can be functionalized to carry specific ligands or antibodies that target specific cells or tissues. This targeted drug delivery approach is particularly relevant in the context of biopharmaceuticals, where precision in drug delivery can improve therapeutic outcomes and reduce side effects. One of the challenges with biopharmaceuticals is their susceptibility to degradation in the digestive tract when taken orally. Gelatin capsules, including enteric-coated gelatin capsules, can protect the biopharmaceuticals from gastric degradation, allowing for oral delivery of certain biologics. Gelatin-based dressings and scaffolds are used in wound healing and tissue repair applications, which are closely related to biopharmaceutical research in regenerative medicine. Gelatin nanoparticles can be used as carriers for diagnostic agents, such as contrast agents for medical imaging or markers for in vitro diagnostics. These applications are relevant in

biopharmaceutical research and diagnostics. This factor will pace up the demand of the United States Pharmaceutical Gelatin Market.

Rising Geriatric Population

The elderly often have more complex healthcare needs due to age-related chronic conditions, such as cardiovascular diseases, arthritis, and diabetes. This necessitates a greater use of pharmaceuticals and dietary supplements, many of which utilize gelatin capsules or other gelatin-based formulations. Elderly individuals may have difficulty swallowing large pills or tablets. Gelatin capsules are preferred by many because they are generally smaller and easier to swallow, making medication adherence more manageable for seniors. As people age, there is an increased focus on maintaining health and well-being. The elderly often take nutritional supplements, vitamins, and dietary products, many of which are encapsulated in gelatin. These products address specific health concerns commonly associated with aging.

Some medications are tailored to the elderly population, addressing age-related conditions like osteoporosis or cognitive decline. Gelatin capsules are often used for the formulation of these medications. For elderly patients who may need controlled drug release or precise dosing, gelatin capsules can be customized to meet these requirements. Controlled-release formulations are essential for managing chronic conditions effectively. Older adults may be taking multiple medications simultaneously. Gelatin capsules help with medication organization and reduce the risk of dosage errors, improving pharmaceutical compliance. Many elderly individuals are accustomed to gelatin-based medications and prefer them. Familiarity with these dosage forms can lead to continued demand. Gelatin is known for its digestibility, which is important for older adults who may have gastrointestinal issues or compromised digestion. Gelatin-based dosage forms are gentle on the stomach. The development of new medications for geriatric populations often involves clinical trials. Gelatin-based formulations may be chosen for these trials to ensure ease of administration and minimize variables in drug delivery. This factor will accelerate the demand of the United States Pharmaceutical Gelatin Market.

Key Market Challenges

Raw Material Supply and Price Volatility

Pharmaceutical gelatin is predominantly derived from animal sources, such as bovine (cattle) and porcine (pig) skins and bones. The availability and cost of these raw

materials are subject to factors such as disease outbreaks in livestock, fluctuations in animal populations, and changes in the United States supply of animal hides and bones. Climate conditions, such as droughts and extreme weather events, can affect animal husbandry and the quality of hides and bones. These environmental factors can disrupt the supply chain for gelatin production. Disease outbreaks in livestock, such as foot-and-mouth disease or African swine fever, can lead to significant disruptions in the availability of raw materials, as affected animals may not be suitable for gelatin production. The cost of animal feedstock, which directly impacts the health and growth of animals, can fluctuate due to factors like feed crop yields, transportation costs, and United States demand for animal feed. The prices of animal-derived raw materials can be volatile, affecting the overall production costs of gelatin. Price fluctuations can result from market dynamics, currency exchange rates, and supply-demand imbalances. Concerns about the environmental impact and ethical considerations related to animal-derived gelatin have led to increased interest in alternative sources, such as plant-based gelatin alternatives. This transition can introduce uncertainty in the raw material supply chain. Gelatin used in pharmaceuticals must meet stringent regulatory standards for safety and quality. Compliance with these standards can require additional quality control measures and documentation, which can impact production costs.

Sustainability and Ethical Concerns

Gelatin production, especially when derived from animal sources, has environmental implications. The livestock industry, which provides the raw materials for gelatin, can contribute to deforestation, greenhouse gas emissions, and water usage. Sustainable sourcing practices and the reduction of environmental footprints are becoming more critical. The sourcing of animal-derived gelatin raises ethical questions about animal welfare. Concerns about the treatment of animals in the meat industry and the conditions in which they are raised have prompted calls for more humane practices and alternatives to animal-derived gelatin.

Dependence on animal-derived gelatin creates concerns about the reliability and sustainability of these sources. Disease outbreaks, such as foot-and-mouth disease or avian influenza, can disrupt the supply chain and raise questions about the safety of gelatin derived from affected animals. Consumer preferences are shifting toward products that align with ethical and sustainability values. As a result, some consumers may seek alternatives to traditional gelatin, potentially impacting the market. Compliance with evolving environmental and ethical regulations can be challenging for pharmaceutical gelatin manufacturers. Meeting sustainability standards and ensuring ethical sourcing practices require investment and adherence to new regulatory

requirements. The development and adoption of plant-based alternatives to gelatin have gained momentum in response to sustainability and ethical concerns. Plant-based gelatin alternatives are appealing to consumers looking for cruelty-free and environmentally friendly options. Ensuring transparency in the gelatin supply chain, from raw material sourcing to production processes, is essential for addressing sustainability and ethical concerns. This requires robust tracking and verification systems.

Key Market Trends

Shift Towards Plant-Based Alternatives

Plant-based alternatives are often considered more sustainable than animal-derived gelatin because they typically have a lower environmental footprint. The production of plant-based gelatin alternatives may involve fewer greenhouse gas emissions, less water usage, and reduced land impact compared to livestock farming for gelatin production. Concerns about animal welfare and the ethical treatment of animals in the food and pharmaceutical industries have led to a growing interest in cruelty-free alternatives. Plant-based gelatin alternatives eliminate the need for animal-derived ingredients, addressing these concerns. There is a significant and increasing demand for vegan and vegetarian products, including pharmaceuticals and dietary supplements. Plant-based gelatin alternatives cater to these dietary preferences and align with vegan and vegetarian lifestyles. Some religious and cultural dietary restrictions prohibit the consumption of animal-derived ingredients, making plant-based gelatin alternatives a suitable choice for individuals following these dietary guidelines. Plant-based alternatives can be advantageous for individuals with allergies or sensitivities to animal-derived products. They offer an allergen-friendly option for pharmaceutical manufacturers and consumers. Advances in food science and technology have led to the development of innovative plant-based ingredients that can mimic the properties of traditional gelatin. This allows for customization and the creation of plant-based alternatives with specific characteristics, such as gelling properties and texture.

Segmental Insights

Type Insights

In 2022, the United States Pharmaceutical Gelatin Market largest share was held by Type B gelatin segment and is predicted to continue expanding over the coming years. Type B gelatin, also known as acid-processed gelatin, is highly versatile and suitable for a wide range of pharmaceutical applications. It is used in various dosage forms,

including soft gel capsules, hard gel capsules, and tablets. Type B gelatin is typically processed using acid, which results in lower endotoxin levels compared to Type A gelatin (alkaline-processed). Lower endotoxin levels are crucial in pharmaceutical applications to ensure product safety and reduce the risk of adverse reactions. They exhibit excellent gelling properties, making it ideal for use in the production of soft gel capsules, which are a popular dosage form in the pharmaceutical industry. Type B gelatin is compatible with a broad spectrum of pharmaceutical ingredients, including hydrophobic and hydrophilic compounds, vitamins, minerals, and active pharmaceutical ingredients (APIs).

Source Insights

In 2022, the United States Pharmaceutical Gelatin Market largest share was held by porcine segment and is predicted to continue expanding over the coming years. Porcine gelatin is widely used in pharmaceutical applications because of the ready availability of porcine collagen, which is derived from the skin and bones of pigs. This source of gelatin is abundant and can meet the high demand from the pharmaceutical industry. Porcine gelatin is highly versatile and can be used in various pharmaceutical formulations, including soft gel capsules, hard gel capsules, tablets, and coatings. Its versatility makes it suitable for a wide range of drug delivery systems. Pharmaceutical-grade porcine gelatin can be manufactured to meet stringent quality and purity standards, ensuring its suitability for use in drug products. Porcine gelatin is generally considered to have lower allergenicity compared to gelatin derived from some other animal sources. This can be an important factor in the selection of gelatin for pharmaceutical applications.

Function Insights

In 2022, the United States Pharmaceutical Gelatine Market largest share was held by stabilizing agent segment and is predicted to continue expanding over the coming years. The primary purpose of stabilizing agents is to improve the stability and functionality of gelatin in pharmaceutical applications. This includes maintaining its physical and chemical properties, preventing degradation, and ensuring consistent performance. Stabilizing agents help protect gelatin from degradation due to factors such as heat, humidity, light exposure, and oxygen. These agents can extend the shelf life of gelatin-containing pharmaceutical products. Gel strength is an important property of gelatin, especially in the production of capsules and coatings. Stabilizing agents can help preserve the gel strength of gelatin over time, ensuring that it functions as intended in drug delivery systems. Gelatin cross-linking can occur over time, leading to changes

in its properties and performance. Stabilizing agents can inhibit or slow down this cross-linking process, thereby maintaining the integrity of the gelatin.

End-User Insights

In 2022, the United States Pharmaceutical Gelatin Market largest share was held by softgels capsules segment in the forecast period and is predicted to continue expanding over the coming years. Soft gel capsules are known for their ease of swallowing, which makes them a preferred dosage form for many patients, including children and the elderly. This ease of administration contributes to their popularity among consumers. Soft gel capsules provide a precise and consistent dosage of medications or supplements. This is important in pharmaceuticals where accurate dosing is critical for therapeutic efficacy and safety. Some drugs or nutrients are better absorbed by the body when formulated in soft gel capsules. The gelatin shell helps improve the bioavailability of certain compounds, enhancing their therapeutic effect. Soft gel capsules can effectively mask the taste and odour of drugs or supplements, making them more palatable to patients who may have an aversion to the taste of medications.

Regional Insights

The Midwest area dominates the United States Pharmaceutical Gelatin Market in 2022. The Midwest is home to some of the world's largest pharmaceutical companies and research institutions. These organizations have a substantial demand for pharmaceutical gelatin for drug formulations, including gelatin capsules and coatings. Midwest invests significantly in pharmaceutical research and development, leading to the creation of a wide range of new drugs and formulations. Many of these formulations utilize gelatin as a key ingredient for drug delivery systems. The region has a well-developed and advanced healthcare infrastructure, which includes hospitals, clinics, and pharmacies. This infrastructure supports the use of pharmaceutical gelatin in various drug delivery forms.

Key Market Players

Rousselot Inc.

Gelita USA Inc

Darling Ingredients

Weishardt Holding SA

Nitta Gelatin NA Inc.

Capsugel Inc

Gelatex Technologies

Norland Products, Inc

Report Scope:

In this report, the United States Pharmaceutical Gelatin Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

Pharmaceutical Gelatin Market, By Type:

Type A

Type B

Pharmaceutical Gelatin Market, By Source:

Porcine

Bovine Skin

Bovine Bone

Fish

Poultry

Pharmaceutical Gelatin Market, By Function:

Stabilizing

Thickening

Gelling

Others

Pharmaceutical Gelatin Market, By End User:

Hard Capsule

Soft Capsule

Tablet

Absorbable Hemostat

others

Pharmaceutical Gelatin Market, By region:

South

Midwest

West

Northeast

Competitive Landscape

Company Profiles: Detailed analysis of the major companies presents in the United States Pharmaceutical Gelatin Market.

Available Customizations:

United States Pharmaceutical Gelatin Market report with the given market data, Tech Sci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

Detailed analysis and profiling of additional market players (up to five).

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