

UPSC CURRENT AFFAIRS NOTES 10-10-2023

PROTEIN BINDERS

The Food Safety and Standards Authority of India (FSSAI) clarified that **addition of protein binders in milk** and milk products are **not permitted**.

Additives that have not been specified in the Food Safety and Standards (Food Products Standards and Food Additives) Regulation, 2011, cannot be added.



Texture Enhancement: Protein binders are used to modify the texture and consistency of food products. In dairy products like curd (yogurt), they can be added to create a thicker or creamier texture, enhancing the overall eating experience.

Diverse Food Applications: Protein binders are versatile and find applications in various types of foods, particularly in semi-solid or solid products where texture plays a crucial role in consumer acceptance. This includes not only dairy but also items like sauces, dressings, and baked goods.

Digestibility and Nutritional Impact: The addition of protein binders can affect the digestibility of the proteins present in the food product. This can have implications for the bioavailability of essential nutrients and the overall nutritive value of the food.

Bioavailability of Active Compounds: Beyond texture and nutrition, protein binders can also influence the bioavailability of bioactive compounds, such as vitamins, minerals, and phytochemicals, that may be present in the food. Binding interactions can affect how these compounds are absorbed and utilized by the body.

Ingredient Selection: The choice of protein binders is critical, as different proteins can have varying effects on texture, digestibility, and bioavailability. The selection depends on the desired characteristics of the final product.

About Protein Binders

Protein binders, also known as binding proteins or simply binders, play a critical role in various biological processes.

They are essential components of living organisms, and their ability to interact specifically with other molecules is fundamental to many aspects of life.

Nature of Protein Binders:

Protein Structure: Binders are typically proteins, which are complex biomolecules composed of amino acid chains folded into specific three-dimensional structures.

Specificity: Protein binders exhibit high specificity, meaning they can selectively recognize and interact with particular molecules, known as ligands.

Binding Sites: Binders have specific regions or pockets, called binding sites or active sites, where ligand interactions occur.

Binding Affinity: The strength of the interaction between a binder and its ligand is characterized by binding affinity, often measured by dissociation constants (Kd).

Functions of Protein Binders:

Protein binders have diverse functions within biological systems:

Transport: Some proteins, like haemoglobin, bind to and transport molecules such as oxygen, ensuring their efficient distribution throughout the body.

Signalling: Cell surface receptors, like those for neurotransmitters or hormones, bind to ligands to initiate cellular signalling pathways.

Immune Response: Antibodies are protein binders produced by the immune system to recognize and neutralize foreign substances (antigens).

Enzyme Regulation: Proteins can act as binders to regulate enzyme activity by either activating or inhibiting enzymatic reactions.

Gene Expression: Transcription factors bind to DNA sequences to control gene expression, influencing protein synthesis.

Structural Support: Proteins like collagen bind together to provide structural support to tissues and organs.

Types of Protein Binders:

Protein binders can be categorized based on their functions:

Enzymes: Binders that catalyze biochemical reactions by binding to substrates and facilitating their conversion into products.

Antibodies: Binders produced by the immune system to recognize and neutralize foreign antigens.

Receptors: Cell surface proteins that bind to specific ligands, transmitting signals and initiating cellular responses.

Transport Proteins: Binders that transport molecules (e.g., hemoglobin for oxygen, albumin for various substances) within the body.

Binding Proteins: These proteins bind to small molecules, such as hormones or vitamins, to transport them through the bloodstream.

Transcription Factors: Proteins that bind to DNA and regulate gene expression by initiating or inhibiting transcription.

Chaperones: Binders that assist in protein folding, preventing misfolding and promoting proper assembly.

RNA-Binding Proteins: Proteins that interact with RNA molecules, influencing RNA processing, transport, and translation.

Applications of Protein Binders:

Protein binders have a wide range of applications in various fields:

Biotechnology: Protein binders are used in techniques like Western blotting, ELISA, and protein purification.

Pharmaceuticals: Monoclonal antibodies, a type of protein binder, are used in therapies for cancer, autoimmune diseases, and infectious diseases.

Diagnostics: Protein binders are critical components of diagnostic assays, helping detect specific molecules in clinical samples.

Biological Research: They are essential tools for studying protein-protein interactions, signal transduction pathways, and gene regulation.

Drug Development: Protein binders are targeted in drug discovery to design molecules that modulate specific binding interactions.

Agriculture: They play a role in developing genetically modified crops and improving crop resistance to pests or environmental conditions.

WATERMEAL

Scientists from Mahidol University in Thailand have been exploring the potential of watermeal, the **smallest flowering plant on Earth**, as a source of nutrition and oxygen for astronauts.



Watermeal, the smallest flowering plant on Earth, is being explored as a potential source of nutrition and oxygen for astronauts by scientists from Mahidol University in Thailand.

This research was conducted in collaboration with the European Space Agency's (ESA) ESTEC technical centre in the Netherlands.

Hypergravity Experiment

The research involved subjecting watermeal to hypergravity conditions aboard ESA's Large Diameter Centrifuge (LDC), capable of simulating gravity levels up to 20 times that of Earth for extended durations.

The goal was to understand how watermeal responds to changing gravity levels, which is essential for future space-based agriculture.

Watermeal Characteristics

Watermeal is even smaller than its relative, duckweed, and lacks roots, stems, or leaves. It simply floats on bodies of water.

Due to its simplicity and rapid growth rate, watermeal is an ideal candidate for studying the effects of gravity shifts on plant development.

Potential as Space Food

Watermeal is a **prolific producer of oxygen through photosynthesis and is rich in protein.**

It has been a part of the local diet in Thailand and other Asian countries, consumed in various forms such as soups and salads.

Watermeal's high nutritional value and the fact that 100% of the plant can be consumed make it a promising candidate for space-based agriculture.

Experiment Details

Watermeal samples were placed in boxes equipped with LEDs that mimic natural sunlight.

These samples were then subjected to hyper gravity conditions by spinning at 20 times Earth's gravity (20 g) in the centrifuge.

The growth and development of watermeal under these conditions were observed over a two-week period.

After the experiment, the researchers conducted a detailed chemical analysis on solid pellet extracts from the watermeal samples to understand how they responded to hyper gravity.

Potential Insights and Applications

The study is expected to provide valuable insights into how plants adapt to different gravity environments, which is crucial for sustainable agriculture in space.

Watermeal's ability to produce oxygen and its high nutritional value make it a multifunctional candidate for future space missions.

Understanding how watermeal responds to hypergravity can pave the way for developing space-based agriculture systems that provide both food and oxygen for astronauts.

About

Watermeal, belonging to the genus *Wolffia*, is renowned as the smallest flowering plant on Earth.

It is an aquatic plant that is often found floating on the surface of still bodies of water, such as ponds, lakes, and slow-moving streams.

Despite its diminutive size, watermeal plays a significant role in aquatic ecosystems and has garnered attention for its potential applications beyond its natural habitat.

Key Characteristics of Watermeal:

Size: Watermeal plants are incredibly small, typically measuring less than one millimeter in length. They are often described as tiny green specks that collectively form a floating mat on the water's surface.

Appearance: Individual watermeal plants consist of a simple, flattened, and oval-shaped structure that lacks roots, stems, and true leaves. They are green in color due to the presence of chlorophyll.

Reproduction: Watermeal reproduces asexually, primarily through budding. New plants emerge from the mother plant, and these daughter plants eventually separate to form independent individuals.

Ecological Significance:

Habitat and Range: Watermeal is found in various parts of the world, with a particular concentration in tropical and subtropical regions. It thrives in slow-moving or still waters with abundant sunlight.

Ecological Role: Despite its size, watermeal plays a crucial ecological role. It provides habitat and food for various aquatic organisms, including small invertebrates and waterfowl. Additionally, it contributes to nutrient cycling in aquatic ecosystems.

Potential Applications:

Nutrient Removal: Watermeal has the ability to absorb excess nutrients, such as nitrogen and phosphorus, from water bodies. This property makes it a potential tool for water purification and the management of eutrophication in polluted waters.

Sustainable Agriculture: As mentioned in the article, watermeal is rich in protein and can be a valuable source of nutrition. It is considered a potential candidate for sustainable agriculture, both on Earth and in space, due to its high nutritional value and rapid growth rate.

Space-Based Research:

Hypergravity Experiments: Watermeal has been used in experiments involving hypergravity conditions to study its growth and development in

altered gravitational environments. These experiments provide insights into how plants adapt to different gravity levels, essential for space agriculture.

Oxygen Production: Watermeal is a proficient producer of oxygen through photosynthesis. This property makes it a potential oxygen source for long-duration space missions where life support systems are crucial.

System based automatic ‘Status Holder’ certificates under Foreign Trade Policy 2023

In a meeting with the Export Promotion Councils today, the Union Minister of Commerce & Industry, Consumer Affairs, Food & Public Distribution and Textiles unveiled a significant initiative to issue system based automatic ‘Status Holder’ certificates under the Foreign Trade Policy (FTP) 2023.

Now the exporter will not be required to apply to the office of Directorate General of Foreign Trade (DGFT) for a Status Certificate and the export recognition will be provided by the IT system based on available Directorate General of Commercial Intelligence and Statistics (DGCIS) merchandise export electronic data and other risk parameters.



This perspective is a paradigm shift in doing things as it not only reduces compliance burden and promotes ease of doing business but also recognizes the need and importance of collaboration within the Government.

At present, the exporter is required to file an online application along with an export certificate from a Chartered Accountant for grant of Status.



The DGFT Regional Offices, as per the laid down timelines are supposed to issue the certificate in 3 days.

The new arrangement will lead to a simplified regime where no applications are invited from exporters and the certification is granted every year in August based on annual export figures available with the partner government agency i.e., DGCIS.

Exporters who are eligible for a higher status based on additional export data relating to services export, deemed exports or double weightage to some entities like MSME etc., which is not getting captured in disaggregated form presently, can apply online for a Status modification also at a later date.

The Status Holder certification program provides credibility to the Indian exporters in the international markets. In addition, it provides certain other privileges including simplified procedures under FTP 2023 and priority custom clearances on self-declaration basis, exemption from compulsory negotiation of documents through banks, exemption from filing Bank Guarantee for FTP schemes etc.

With the launch of this new system, the Department of Commerce, Ministry of Commerce and Industry will be recognizing about 20,000 exporters under FTP 2023 as Status Holders which will be a quantum jump from the earlier number of 12,518 exporters.

The biggest increase in Status certification is seen in the 1 Star category, which is the lowest category and requires an export performance of at least US\$ 3 Million in the last 3 preceding financial years plus the 3 months of the current financial year.

This will enable the Government to hand hold a larger number of small exporting entities and create a vibrant export ecosystem and help reach our export target of US\$ 2 Trillion by 2030.

In line with digital India ethos, various e-initiatives have already been implemented where no manual examination or processing is required and various permissions/authorisations are issued under FTP 2023 based on a risk management system and self-declarations of the exporter including 24X7 online issue of Importer Exporter Code number (IEC), issue and renewal of Advance Authorisations.

ANNUAL JOINT HADR EXERCISE 2023 – (CHAKRAVAT 2023)

The Annual Joint HADR Exercise (AJHE) is an outcome of Hon'ble PM's directive promulgated during Combined Commanders' Conference-2015.

Since its first edition in 2015, the Annual Joint HADR Exercise, CHAKRAVAT, has transformed itself into a multi-agency endeavour involving participation of all three Services, Paramilitary Forces, as well as several disaster response organisations, NGOs, academic institutions and international organisations.

The 2023 edition would further synergise efforts at the national level among all stakeholders, as well as witness participation from eight countries of the Indian Ocean Region.



The exercise has been conducted by Indian Army, Indian Navy (IN) and Indian Air Force (IAF) in rotation since 2016. The last edition of the exercise was conducted at Agra by IAF.

The 2023 edition of the exercise is being hosted by the Indian Navy at Goa from 09 to 11 Oct 23.

Developing collective and coordinated effective response mechanisms to address humanitarian crises and natural disasters are one of the most visible

elements in India's inclusive vision for the oceans - **SAGAR, or Security And Growth for All in the Region.**

Humanitarian Assistance and Disaster Relief (HADR) operations form a key component in the Indian Navy's Benign Role, as climate change has significantly increased vulnerability of the Indian Ocean Region (IOR) to natural disasters.

The challenge posed by climate change is accentuated by the limited capacity of littoral IOR states to address this rapidly growing threat. Therefore, Indian Armed Forces have been frequently called upon to render assistance to our friends and partners in the Region, thereby, strengthening the need and our resolve to be the 'First Responder' in the region.

While the three Services continue to provide relief and succour in the event of a calamity, a whole of government approach would further enhance our preparedness and response to such unfortunate events.

IMF-World Bank Annual Meetings 2023

Union Minister for Finance & Corporate Affairs will be embarking on an official visit to Marrakech, Morocco, beginning October 10, 2023.

The Annual Meetings of the World Bank Group (WBG) and the International Monetary Fund (IMF), along with G20 meetings, Investor/ Bilateral meetings with Indonesia, Morocco, Brazil, Switzerland, Germany and France, besides other associated meetings, scheduled to take place from October 11-15, 2023, in Marrakech, Morocco.



ANNUAL MEETINGS
2023 | Marrakech
WORLD BANK GROUP
INTERNATIONAL MONETARY FUND

The Annual Meetings will be attended by Finance Ministers and Central Bankers from across the world. The Annual Meetings, which generally take place in October, are customarily held in Washington D.C. for two consecutive years and in another member country in the third year.



The Indian delegation for the Annual Meetings will be led by the Union Minister for Finance & Corporate Affairs and will comprise officials from the Ministry of Finance and the Reserve Bank of India.

The fourth G20 FMCBG meeting will comprise of two sessions

Strengthening Multilateral Development Banks (MDBs) to address shared challenges of the 21st Century

Global Economy and Crypto Assets Agenda

During the meeting, the Volume 2 of the Report on strengthening MDBs by the Independent Expert Group (IEG) will also be released. Volume 1 was released during the 3rd FMCBG held in Gandhinagar, Gujarat.

On the sidelines of the fourth G20 FMCBG meeting, Principals from Indian G20 Presidency, International Monetary Fund, and the World Bank will co-chair Global Sovereign Debt Roundtable (GSDR) on 12th October 2023.

The Roundtable will discuss the progress made on debt restructuring and explore ways and means to support work of G20 countries.

In a high-level event organised by USA Treasury, Union Finance Minister will engage in a Roundtable Discussion on “IMF policy priorities and how the institution should support its membership”.

The Union Finance Minister will also participate in a discussion on Partnership for “Resilient and Inclusive Supply-chain Enhancement” (RISE) – with the World Bank Group, organised by the G7 Japan Presidency.

On the margins of the IMF-WB Annual Meetings in Marrakech, Smt. Sitharaman will participate in a discussion on macroeconomic outlook during a G7 Africa Ministerial Roundtable.

Smt. Sitharaman will also give keynote address at a session on “MDBs evolution”.

In the course of her visit, the Union Finance Minister will also participate in a Roundtable on “Reviving Growth with Inclusivity: Galvanising Private Capital to support Governments and Multilateral Institutions”.

Periodic Labour Force Survey (PLFS) Annual Report 2022-2023 Released

Increasing Trend in Labour Force Participation Rate and Worker Population Ratio. Constant Decrease in Unemployment Rate.

Considering the importance of availability of labour force data at more frequent time intervals, National Sample Survey Office (NSSO) launched Periodic Labour Force Survey (PLFS) in April 2017.

The objective of PLFS is primarily two fold:

To estimate the key employment and unemployment indicators (viz. Worker Population Ratio, Labour Force Participation Rate, Unemployment Rate) in the short time interval of three months for the urban areas only in the 'Current Weekly Status' (CWS).

Labour Force SURVEY



to estimate employment and unemployment indicators in both 'Usual Status' and CWS in both rural and urban areas annually.

Now the sixth Annual Report is being brought out by NSSO on the basis of Periodic Labour Force Survey conducted during July 2022-June 2023.

PLFS fieldwork during July 2022 – June 2023

The field work for collection of information in respect of the samples, allotted for the period July 2022 – June 2023, was completed timely for the first visit as well as revisit samples, except for 51 first visit and 68 revisit FSUs for the State of Manipur, allotted in the last quarter i.e., April-June 2023, which were treated as casualties, due to disturbed field situation and unavailability of internet services.

Canvassing of revisit schedules is undertaken mostly in telephonic mode since June 2020 when field work was resumed after the suspension due to Covid-19 pandemic.

Sample Design of PLFS

A rotational panel sampling design has been used in urban areas. In this rotational panel scheme, each selected household in urban areas is visited four times, in the beginning with 'First Visit Schedule' and thrice periodically later with a 'Revisit Schedule'. In urban area, samples for a panel within each stratum were drawn in the form of two independent sub-samples. The scheme of rotation ensures that 75% of the first-stage sampling units (FSUs) are matched between two consecutive visits. There was no revisit in the rural samples. For rural areas, samples for a stratum/sub-stratum were drawn randomly in the form of two independent sub-samples. For rural areas, in each quarter of the survey period, 25% FSUs of annual allocation were covered.

Sampling method

Sample Size for First Visit during July 2022- June 2023 in rural and urban areas for the Annual Report: Out of the total number of 12,800 FSUs (7,024 villages and 5,776 UFS blocks) allotted for the survey at the all-India level during July 2022 - June 2023, a total of 12,714 FSUs (6,982 villages and 5,732 urban blocks) were surveyed for canvassing the PLFS schedule (Schedule 10.4). The number of households surveyed was 1,01,655 (55,844 in rural areas and 45,811 in urban areas) and number of persons surveyed was 4,19,512 (2,43,971 in rural areas and 1,75,541 in urban areas). Among the persons surveyed, total number of persons of age 15 years and above was 3,20,260 (1,81,049 in rural areas and 1,39,211 in urban areas).

Conceptual Framework of Key Employment and Unemployment Indicators: The Periodic Labour Force Survey (PLFS) gives estimates of Key employment and unemployment Indicators like, the Labour Force Participation Rates (LFPR), Worker Population Ratio (WPR), Unemployment Rate (UR), etc. These indicators, and the 'Usual Status' and 'Current Weekly Status' are defined as follows:

Labour Force Participation Rate (LFPR): LFPR is defined as the percentage of persons in labour force (i.e. working or seeking or available for work) in the population.

Worker Population Ratio (WPR): WPR is defined as the percentage of employed persons in the population.

Unemployment Rate (UR): UR is defined as the percentage of persons unemployed among the persons in the labour force.

Activity Status- Usual Status: The activity status of a person is determined on the basis of the activities pursued by the person during the specified reference period. When the activity status is determined on the basis of the reference period of last 365 days preceding the date of survey, it is known as the usual activity status of the person.

Activity Status- Current Weekly Status (CWS): The activity status determined on the basis of a reference period of last 7 days preceding the date of survey is known as the current weekly status (CWS) of the person.

The Annual Report on PLFS 2022-23 is available at the website of the Ministry(<https://mospi.gov.in>). The key results are given in the statements annexed.

Key Findings of PLFS, Annual Report 2022- 2023

Estimates of key labour market indicators in usual status.

Increasing Trend in Labour Force Participation Rate (LFPR) for persons of age 15 years and above

In rural areas, LFPR increased from 50.7% in 2017-18 to 60.8% in 2022-23 while for urban areas it increased from 47.6% to 50.4%. LFPR for male in India increased from 75.8% in 2017-18 to 78.5% in 2022-23 and corresponding increase in LFPR for female was from 23.3% to 37.0%.

2023 Economics Nobel Prize

US labour economist Claudia Goldin was recently awarded the 2023 Nobel Prize in Economic Sciences for her contributions to understanding women's



labor market outcomes.

It has been awarded to economist Claudia Goldin for advancing the understanding of women's labour market outcomes.



The Nobel Prize in Economic Sciences is also known as the Sveriges Riksbank Prize in Economic Sciences.

Goldin is only the third woman to win the prize since it was first introduced in 1969.

Her Research:

She provided the first comprehensive account of women's earnings and labour market participation through the centuries.

Her research reveals the causes of change as well as the main sources of the remaining gender gap.

She showed that female participation in the labour market did not have an upward trend over a 200-year period, but instead forms a U-shaped curve.

The participation of married women decreased with the transition from an agrarian to an industrial society in the early nineteenth century, but then started to increase with the growth of the service sector in the early twentieth century.

Goldin explained this pattern as the result of structural change and evolving social norms regarding women's responsibilities for home and family.

Historically, much of the gender gap in earnings could be explained by differences in education and occupational choices.

However, Goldin has shown that the bulk of this earnings difference is now between men and women in the same occupation, and that it largely arises with the birth of the first child.

She highlighted the role played by marriage, parenthood, and contraceptive pills in women's education, career, and salary trajectories.