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PROCEEDINGS OF THE FICCI SYMPOSIUM ON

PROTEIN FOR INDIA: NUTRITION, BUSINESS, SUSTAINABILITY & POLICY PERSPECTIVE

8 September 2026 | FICCI, New Delhi



EXECUTIVE SUMMARY

The FICCI Symposium on "Protein for India: Nutrition, Business, Sustainability and Policy Perspective", held on 8 September 2026 at FICCI Federation House, New Delhi, convened policymakers, regulatory authorities, industry leaders, academicians, researchers, and nutrition experts to deliberate upon the evolving dimensions of India's protein ecosystem. The symposium examined the interlinkages between nutrition, food processing, scientific research, sustainability, innovation, industry, and regulatory policy, with particular emphasis on strengthening nutrition security and advancing resilient and sustainable food systems.

The deliberations highlighted that addressing India's protein requirements extends beyond quantitative intake to encompass protein quality, digestibility, bioavailability, affordability, accessibility, and consumer awareness. The significance of dietary diversity and balanced nutrition was emphasised, with due consideration to the complementary contribution of cereals, pulses, dairy, nuts, seeds, eggs, fish, and meat towards meeting the nutritional requirements of diverse population groups. Strengthening nutrition literacy and facilitating informed dietary choices were identified as important components of a comprehensive approach to improving protein adequacy.

The symposium recognised the pivotal role of industry in shaping India's protein landscape through innovation, product development, technological advancement, and resilient value chains. The deliberations highlighted the need to develop affordable and accessible protein solutions by strengthening domestic manufacturing and ingredient capabilities, fostering industry research collaboration, advance India-specific scientific evidence, and ensuring responsible product communication within an enabling policy framework.

The symposium also examined the evolving trajectory of protein demand in India and its implications for agricultural production, food processing, infrastructure, supply chains, investment, and technological innovation. The FICCI–ARE report, "Charting India's Protein Transition: Building Resilient Food Systems for a Secure Future," provided an assessment of projected changes in protein demand and associated requirements for strengthening the food system.

In conclusion, the symposium highlighted the need for a robust, science-based and enabling regulatory framework in facilitating responsible innovation while ensuring food safety, product quality and consumer confidence. An integrated approach across these dimensions can contribute to strengthening India's nutrition security while supporting the resilience, sustainability, and long-term development of the country's food systems.

Welcome Address and Context Setting: Mr. Tarun Arora, President, CIFTI-FICCI

Mr. Tarun Arora welcomed the distinguished guests and participants, including Shri Ranjit Singh, Joint Secretary, Ministry of Food Processing Industries, Dr. Satyen Kumar Panda, Advisor, Quality Assurance, with Additional Charge of the Science, Standards and Regulations Division, FSSAI, and Professor Anupa Siddhu, Former Director, Lady Irwin College and Head, Department of Home Science, University of Delhi. He emphasized the importance of fostering a balanced approach to strengthening India's protein nutrition ecosystem through dialogue on nutrition, innovation, sustainability, regulatory frameworks, and consumer awareness.

He noted that while India has made significant progress in improving food security and access to calories, the country's development trajectory now calls for a shift towards nutrition security. In this transition, protein assumes a central role in ensuring access to quality nutrition and supporting improved health outcomes across population groups. He highlighted that India's diverse dietary practices, regional food preferences, socio-economic conditions, and varying nutritional needs require a nuanced and inclusive approach to the protein discourse.



He observed that the conversation around protein is no longer limited to nutrition experts and policymakers. Growing health consciousness, changing lifestyles, increasing focus on fitness and wellness, urbanization, and digital influence have contributed to rising consumer interest in protein-rich foods. He noted that protein has evolved from being associated primarily with sports nutrition and supplements to becoming a mainstream nutritional priority for consumers. This shift is driving demand for a wide range of products, including high-protein dairy products, beverages, snacks, fortified foods, and convenient ready-to-eat formats.

Highlighting the role of the food processing industry, he outlined the opportunities for innovation across conventional and emerging protein sources, including plant-based and alternative proteins. He noted that advancements in food technology are expanding consumer choices while creating new avenues for product development, investment, and entrepreneurship. At the same time, he stressed the need to strengthen value chains from farm to consumer to improve accessibility, affordability, and availability of protein-rich foods.

Mr. Arora further emphasized that efforts to enhance protein availability must be accompanied by sustainability considerations. Addressing nutritional needs must be balanced with challenges relating to climate change, resource efficiency, water availability, biodiversity conservation, and food loss and waste. He underscored the importance of an enabling policy and regulatory environment that supports innovation while ensuring food safety, nutritional quality, consumer awareness, and equitable access.

In conclusion, he expressed confidence that the symposium would provide a valuable platform for stakeholders to exchange perspectives, deliberate on emerging opportunities and challenges, and contribute towards advancing India's protein nutrition agenda and the broader goal of improving public health and well-being.

Special Address: Professor Anupa Siddhu, Former Director, Lady Irwin College & Head, Department of Home Science, University of Delhi

Professor Anupa Siddhu welcomed the participants and observed that protein has long been central to India's nutrition discourse, particularly in addressing malnutrition and protein-energy malnutrition. She noted that the current focus on protein reflects a broader nutrition transition, characterised by changing dietary patterns, rising health awareness, and increasing attention to protein quality, affordability, sustainability, and informed consumption.



She emphasized the importance of the Dietary Guidelines for Indians, 2024 as a common reference framework for scientists, policymakers, industry, and consumers. She reiterated the guideline on obtaining good-quality protein and essential amino acids through appropriate food combinations. Explaining that cereals, millets, pulses, and nuts contain different limiting amino acids, she noted that combining these foods, along with milk and other protein sources, helps improve overall protein quality and supports balanced nutrition.

Professor Siddhu outlined the diverse physiological functions of protein, including its role in growth, muscle and bone health, metabolic regulation, healthy ageing, and maintenance of physical function. She explained that protein requirements are established through rigorous scientific approaches, including nitrogen balance studies, and vary according to age, physiological status, and activity levels. While higher protein intakes may be required for elite athletes and specific population groups, she cautioned against the perception that higher consumption is universally beneficial, stressing the importance of adhering to established scientific recommendations.

Professor Siddhu drew attention to the role of food labelling as an important tool for nutrition education, particularly in enabling consumers to understand the nutritional value of foods and make informed choices. She further advocated wider dissemination of the comprehensive recommendations contained in the Dietary Guidelines for Indians, including guidance on age-specific nutrition, complementary feeding, dietary diversity, physical activity, and healthy eating practices.

Addressing prevailing dietary patterns, she noted that Indian diets are often characterized by excessive cereal consumption and comparatively inadequate protein intake. She emphasized the need to improve protein adequacy through a combination of diverse protein sources while maintaining sufficient intake of fruits, vegetables, and other nutrient-rich foods. She stressed that the objective should be adequate protein intake rather than excessive intake.

Professor Siddhu identified sustainability as a critical consideration in shaping future protein strategies. She underscored the importance of leveraging diverse and locally relevant protein sources, including pulses, soybean, dairy, and other plant-based foods, while ensuring that dietary recommendations remain affordable, culturally appropriate, and environmentally sustainable.

In conclusion, Professor Siddhu reflected on the growing transition from traditional household protein sources to functional foods and protein supplements, while reaffirming that a diverse and balanced diet remains the foundation of good nutrition. She expressed confidence that continued

engagement among academia, industry, policymakers, and regulators would help strengthen nutrition literacy and encourage healthier dietary practices across the population.

Keynote Address: Dr. Satyen Kumar Panda, Advisor (Quality Assurance, Additional charge (Science & Standards & Regulations Division)), FSSAI

Dr. Satyen Kumar Panda delivered the keynote address, noting the growing relevance of protein in discussions around nutrition, business, sustainability, and policy. He appreciated the symposium's focus on protein and called for greater engagement among academia, industry, regulators, and other stakeholders to promote informed and evidence-based discussions on protein and dietary choices.



He emphasized that protein should be considered as part of an overall balanced diet rather than in isolation, noting the importance of nutritional quality, dietary diversity, physical activity, and appropriate consumer awareness. He highlighted the need to incorporate evidence-based information on protein, muscle health, resistance training, and appropriate consumption into consumer awareness initiatives, including FSSAI's *Eat Right India* programme.

Dr. Panda observed that India's protein-related challenges extend beyond intake and include aspects of protein quality, access, awareness, and consumer trust. He advocated greater nutritional literacy and stressed the importance of ensuring that discussions around protein remain evidence-based, while avoiding misconceptions or the perception that a single nutrient or product can independently address broader nutritional requirements.

From a regulatory perspective, he outlined the key expectations from industry, emphasizing that protein products must be safe and appropriately assessed for contaminants, heavy metals, pathogens, toxins, allergens, and other potential hazards. He stressed the importance of compositional accuracy and honest communication of product composition and claims. He further noted that nutritional quality should not be assessed solely on total protein content, but should also consider parameters such as protein quality and digestibility, including PDCAAS and DIAAS where relevant.

Dr. Panda also addressed emerging protein sources, including plant proteins, oilseeds, and fermentation-derived proteins, and pointed to opportunities associated with the government's BioE3 initiative. He stated that innovation is welcome, but new protein sources must be appropriately addressed in terms of safety assessment, identity, labelling, and nomenclature. He further emphasized the need for appropriate hazard analysis and risk assessment when developing and introducing new protein sources.

He called upon the industry to strengthen incoming raw material specifications, validate shelf life, invest in quality assurance, and support analytical method development and harmonization. He particularly emphasized the importance of robust quality assurance in the nutraceutical sector, where consumers place considerable trust in products associated with health and wellness.

He also advocated for greater consumer education to prevent excessive or inappropriate use of protein supplements and recognized the role of resistance training and exercise alongside protein

consumption. He encouraged the industry to consider affordability and accessibility while developing protein products so that the benefits of innovation can extend beyond urban and fitness-oriented consumers.

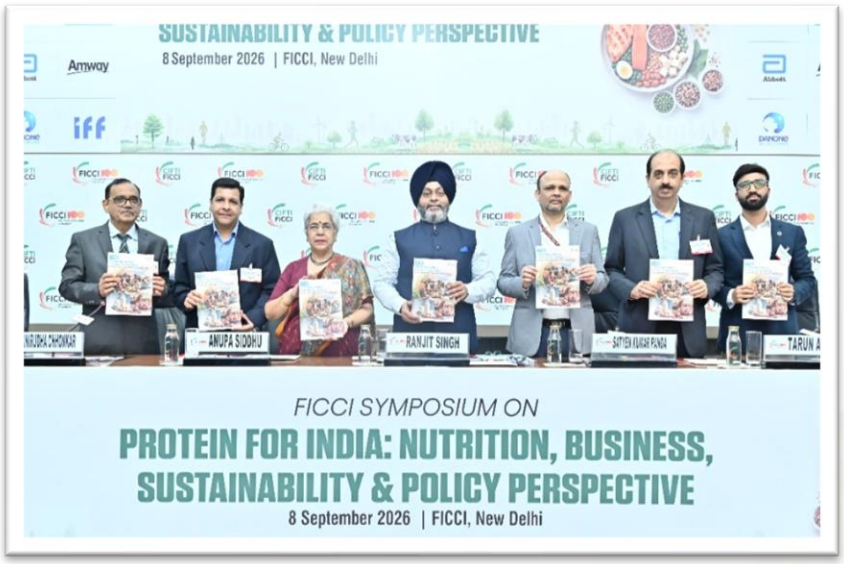
In conclusion, Dr. Panda observed that public health and business growth can be advanced concurrently through responsible industry practices, consumer trust, and clear scientific and regulatory frameworks. He called for constructive dialogue among government, regulators, industry, academia, and civil society, and encouraged stakeholders to move the conversation from protein awareness to protein literacy and from individual products to overall dietary quality.

Release of the FICCI - ARE Report on "Charting India's Protein Transition: Building Resilient Food System

Shri Ranjit Singh, Joint Secretary, Ministry of Food Processing Industries and Guest of Honour, released the FICCI–ARE Report on "Charting India's Protein Transition: Building Resilient Food Systems for a Secure Future."

The symposium marked the release of the report, jointly developed by Asia Research & Engagement (ARE) and the Federation of Indian Chambers of Commerce and Industry (FICCI). The report examines India's evolving protein landscape and the projected growth in per-capita protein consumption through 2070. The report highlights key considerations around protein demand, food-system resilience, sustainability and the need for an integrated approach to India's protein transition.

It explores pathways to meet rising protein demand while reducing emissions, strengthening domestic value chains, supporting producer livelihoods and building resilient, sustainable and nutrition-secure food systems which examines India's evolving protein landscape and explores pathways towards building resilient food systems for a secure and sustainable future.



Inaugural Address: Shri Ranjit Singh, Joint Secretary, Ministry of Food Processing Industries

Shri Ranjit Singh delivered the inaugural address, highlighting the growing significance of protein within India's nutrition, food processing, agricultural, business, and policy landscape. He appreciated the symposium for bringing together stakeholders from government, industry, academia and nutrition science to deliberate on an issue with implications for India's nutritional well-being and the future of its food systems and food economy.



He observed that India's post-independence food policies largely focused on achieving food sufficiency and meeting calorific requirements, with relatively less emphasis on protein. He identified the historical focus on cereals and the decline in domestic pulse production, resulting in increased dependence on imports, as relevant considerations in understanding India's protein landscape. He indicated that protein is not only a nutrition issue, but as a subject intersecting nutrition, agriculture, food processing, innovation, sustainability, business, and public policy.

He articulated that India's protein agenda should be guided by the principles of availability, affordability, accessibility, dietary diversity, food safety, quality, and sustainability. He pointed to India's diverse protein sources, including pulses, legumes, dairy, cereals, nuts, seeds, eggs, fish and meat, and stressed the potential to combine traditional food systems with modern food science, processing technologies, innovation and efficient supply chains.

He underscored the role of food processing as a bridge between farm and consumer, driving value addition, reducing food losses, improving market access and generating employment. He outlined opportunities across the protein value chain and stressed the need for affordable, scalable and consumer-relevant protein solutions accessible across income groups and regions.

From the Ministry's perspective, he outlined key initiatives supporting the sector, including the Pradhan Mantri Kisan Sampada Yojana, Production Linked Incentive Scheme for Food Processing Industry, and PM Formalisation of Micro Food Processing Enterprises Scheme, along with the One District One Product approach. He noted that these programmes strengthen processing infrastructure, value addition, innovation, market linkages, and support for micro and small enterprises, creating opportunities for protein-rich and value-added food products.

Addressing sustainability, he called for resource-efficient and resilient food systems, with attention to reducing losses and improving efficiencies across the value chain. He also highlighted the growing business and export opportunities associated with protein-rich and value-added foods, supported by investments in infrastructure, technology, quality systems, and global compliance.

In conclusion, he called for greater collaboration across stakeholders and policy frameworks that enable innovation while ensuring food safety and consumer protection. He noted that India’s agricultural resources, traditional knowledge, scientific capabilities and growing food processing sector provide a strong foundation for advancing the protein ecosystem.

TECHNICAL SESSIONS

Presentation on the FICCI - ARE Report on "Charting India's Protein Transition: Building Resilient Food Systems for a Secure Future" by, Mr Rituj Sahu, Director, Protein Transition – Sustainable Food Systems (India), Asia Research & Engagement (ARE)

Mr. Rituj Sahu presented the joint FICCI–Asia Research and Engagement (ARE) report, Charting India's Protein Transition, examining how India can meet rising protein demand while building a resilient, sustainable, and future-ready food system. The report projects average per capita protein consumption to increase from approximately 9.5 kg in 2025 to 30 kg by 2070, driven by rising incomes, urbanisation, and changing dietary patterns.



He indicated that India's protein transition will be characterised by growth across multiple protein sources. Dairy is projected to remain the largest category, reaching approximately 13.3 million tonnes of protein by 2070, followed by pulses at 9.3 million tonnes, alongside continued growth in poultry, eggs, and seafood. He noted that this diversity represents a unique strength for India, offering opportunities to build a more resilient and balanced protein ecosystem.

The presentation outlined that rising protein demand will increase pressure on land, water, feed, infrastructure and capital, particularly in the context of climate change, heat and water stress, disease and supply disruptions. Under a business-as-usual pathway, annual protein-related emissions could reach 1.92 gigatonnes of CO_2 equivalent by 2070. The report indicated that production-side improvements and greater diversification of protein sources, implemented together, could substantially reduce these environmental pressures and strengthen the resilience of India's protein system.

Mr. Sahu reiterated that India can build on its established strengths in dairy and pulses, while leveraging emerging capabilities in food processing and alternative protein technologies. He called for greater investment in infrastructure, innovation and value-chain capacity, with particular attention to ensuring that smallholders, contract growers and MSMEs are adequately supported in the transition. The presentation also highlighted the importance of policy and finance in enabling the transition through investment in research, processing infrastructure, domestic manufacturing, innovation, standards and traceability.

In conclusion, Mr. Rituj Sahu emphasized that meeting India's future protein demand is both a nutritional imperative and an economic opportunity, with implications across agriculture, food processing, technology, infrastructure and finance.

Panel Discussion: "Making India Healthy Through Protein"



Moderator: Mr. Tarun Arora, CEO, Zydus Wellness

Panellist: Ms. Priyanka Verma, Director Marketing, Danone

Question: *Is India's population getting adequate protein through its current dietary patterns? While protein has gained significant attention, where do the most significant gaps remain across different population groups?*



Response: Ms. Priyanka Verma observed that although protein has gained significant consumer attention, understanding of protein requirements and its role in nutrition remains limited. She emphasised the need for greater consumer education and for translating technical nutritional information into simple, relevant guidance for everyday dietary choices. Referring to the ICMR guidelines, she stated that the protein requirement for a healthy adult is approximately 0.8 g/kg body weight.

She highlighted four key dimensions of protein: quantity, quality, life stage or health condition, and delivery. On protein quality, she emphasised the importance of amino-acid composition, particularly in the context of India's predominantly cereal-based dietary patterns. She advocated combining complementary foods, such as cereals and pulses, to obtain a more balanced amino-acid profile.

She further outlined that protein requirements vary considerably across life stages and health conditions, with higher requirements during infancy, childhood, pregnancy and lactation, as well as among vulnerable and clinical populations. She also drew attention to the importance of digestibility and the form of protein, referring to assessment approaches such as PDCAAS and DIAAS.

Concluding, she positioned protein not merely as a product or isolated nutrient, but as part of a broader nutrition and lifestyle ecosystem. She called for greater consumer education and for the industry to communicate scientific information in a simpler and more accessible manner.

Panellist: Mr. Akhil Meshram, Head of Marketing, Glanbia

Question: *Can a well-balanced diet provide adequate protein for most Indians, and in what circumstances, if any, can protein supplements play a meaningful role in addressing nutritional gaps?*

Response: Mr. Akhil Meshram, observed that while a balanced diet can contribute substantially to protein intake, the quality, digestibility and bioavailability of protein sources are important considerations. He drew attention to India's predominantly cereal- and pulse-based dietary pattern may require appropriate food combinations to provide a more complete amino-acid profile, citing combinations such as rice and pulses as an example.



He further elaborated that protein requirements vary according to lifestyle and life stage, with physically active individuals and older adults requiring greater attention to protein intake. He also pointed that lower digestibility and bioavailability can further affect effective protein intake and may make it challenging for some individuals to meet their requirements through regular meals alone.

In this context, he explained that protein supplements can serve as a convenient means of complementing the diet, particularly for active individuals or those who find it difficult to obtain sufficient protein from conventional foods. He also acknowledged the emergence of convenient options such as unflavoured protein products that can be incorporated into everyday foods and beverages. He concluded that protein intake should primarily remain food-based, while supplements can provide an easier and practical option to address dietary gaps and make everyday meals more protein-rich.

Dr. Shantanu Das, Vice President and Head of Food Sciences. Foods Business Division, ITC Limited

Question: *How can protein be integrated into everyday foods that are tasty, affordable, and accessible, while also addressing the growing need to focus on protein quality alongside protein quantity?*

Response: Dr. Shantanu Das, delineated four key dimensions for building a stronger protein ecosystem: awareness, accessibility, affordability and acceptability. While awareness of protein is

increasing, he stated that understanding remains uneven. He identified accessibility as a challenge in ensuring that protein-rich meals are readily available, while affordability remains a concern as protein sources are generally more expensive than carbohydrates.



Focusing on the fourth dimension, acceptability, Dr. Das emphasised that even if a protein source is well understood, accessible and affordable, it will not achieve sustained consumption if it does not meet consumer expectations for taste. He affirmed the challenge becomes greater when protein is incorporated into staple foods consumed routinely across generations. He cited the integration of protein into products such as roti and biscuits as examples, where maintaining taste and texture while improving protein content presents both formulation and nutritional challenges. He also noted that increasing protein content in packaged foods can affect moisture retention and product texture, creating additional technical challenges.

He further underscored the importance of strengthening supply chains as protein innovations move towards mass-market adoption. Referring to emerging sources such as fermentation-derived proteins, he noted their potential in terms of nutritional quality and taste, while emphasising the need for consistent supply and quality. He advocated for greater collaboration among brands, ingredient producers, suppliers and emerging start-ups to establish an ecosystem to scale such solutions.

Dr. Das also pointed to consumer comfort and digestibility as important considerations in increasing protein consumption. He noted that factors such as the FODMAP content of certain protein-containing products and inadequate digestion may contribute to discomfort among consumers. He articulated that addressing India's protein challenge would require a combination of approaches, including protein-rich everyday foods, supplements and specialised nutrition, supported by coordinated action across the wider protein ecosystem.

Panellist: Dr. Adip Roy, Associate Vice President, Regulatory Affairs, Amway

Question: *Does the source of protein, whether plant or animal, influence its benefits and efficacy? What scientific evidence is available, and what are the key safety aspects?*

Response: Dr. Adip Roy explained that the amino acid composition is a key factor differentiating protein sources, as amino acids serve as building blocks for proteins and play important roles in several biochemical pathways, including nucleic acid formation and neurotransmitter synthesis. He stated that animal proteins are generally considered complete proteins and elucidated the role of amino acids such as leucine in lean muscle mass and the mTOR pathway associated with cellular ageing and health.

He drew attention to the growing interest in plant proteins, driven partly by consumer preference for plant-based products. He explained that plant protein sources can also be rich in unsaturated fats and fibre and low in saturated fats. He referred to large cohort studies indicating that a shift towards plant protein may have positive effects on cardiovascular health.



At the same time, Dr. Roy noted that plant proteins may lack certain essential amino acids, with legumes and grains having complementary amino acid limitations. Therefore, combining different plant protein sources, or appropriately combining plant and animal proteins, can help achieve a more balanced amino acid profile. He also emphasised that well-designed clinical studies establishing the specific health benefits associated with different protein sources remain limited, reinforcing the need for further research to generate more quantifiable evidence, particularly for plant proteins.

On safety, Dr. Roy noted that excessive protein consumption could lead to overexpression of certain biochemical processes and that detoxification could become a concern. He underscored that concerns regarding protein excessive intake are particularly relevant in the context of chronic kidney disease and emphasised the need for further work to better understand the safety aspects of protein consumption.

Panellist: Ms. Rozita Singh, Head of Policy, Good Food Institute, India

Question: *How should policymakers approach diversification across animal, plant-based and emerging protein sources while balancing affordability, sustainability and food system resilience? What evidence and policy frameworks are needed to determine the appropriate role of each within India's nutrition and food system?*

Response: Ms. Rozita Singh foregrounded that the policy question should not be about choosing one protein source over another, but about determining the combination of protein sources that can deliver the best outcomes for nutrition, affordability, sustainability and food system resilience. She elucidated that protein diversification is particularly relevant for India given its strong agricultural base and highlighted the opportunity to move beyond commodities towards higher-value protein ingredients and foods derived from pulses, legumes and millets.



She identified fermentation as another opportunity for scalable protein production and noted the potential to valorise agricultural residues as feedstock for fermentation, thereby reducing input costs for alternative protein production subject to appropriate validation for consistence, safety and technical suitability. She also referred to the BioE3 policy and the support provided for biotechnology research and development and industrial biomanufacturing, while emphasising the need to connect emerging science and technology with agriculture, food processing and nutrition.

Ms. Singh affirmed that policy decisions require evidence, particularly on nutrition and bioavailability, and called for greater collaboration among industry, academia and innovators to generate and provide such evidence. She further positioned dietary diversification as an important policy opportunity, noting the potential for protein-rich and fortified foods to be incorporated into public nutrition programmes

and procurement systems. She advocated for positioning protein within broader nutrition agenda and not limited to discussions around athletes or supplements.

She further articulated the need to develop value chains where India has a competitive advantage and noted opportunities across crop-to-ingredient pathways, fermentation and biomanufacturing. She pointed to gaps between laboratory proof of concept and food-grade commercial-scale production, particularly in access to processing infrastructure such as protein extraction, fractionation, extrusion and fermentation.

To address these gaps, Ms. Singh highlighted the potential for shared, open-access pilot and scale-up facilities rather than requiring every MSME or start-up to build its own infrastructure. She also contemplated upgrading existing oil mills and pulse mills for food-grade protein processing and using retrofitting to support scale-up. She envisaged these as key areas where the ecosystem can work with policymakers to strengthen India's protein value chains.

Presentation on "Human Body Response to Type, Quality and Quantity of Protein" by Dr. Mark Cope, Director, New Business Development, International Flavour and Fragrance, USA

Dr. Mark Cope presented an overview of how the human body responds to the type, quality and quantity of dietary protein, drawing on his experience of more than 25 years in clinical research on dietary patterns, obesity, metabolic health and muscle health. He delineated five key considerations: the need for protein, protein quality, sources of protein, the strength of scientific evidence, and translating evidence into meaningful guidance for consumers. He articulated the need for greater clarity around why, how much, and when protein is required, particularly as consumers are increasingly encouraged to increase their protein intake.

He articulated that protein requirements vary across life stages, including infancy, pregnancy, lactation and ageing, with both quantity and distribution of intake being relevant. He expounded on protein quality as being determined by its amino acid profile and digestibility, and discussed PDCAAS and DIAAS as tools for its assessment. He also brought into focus potential of complementary protein sources to provide a more balanced amino acid profile and explained the pathway from protein consumption through digestion and absorption to the delivery of amino acids to tissues. Beyond muscle health, he underscored protein's diverse roles in enzymes and hormones, immunity, tissue repair, satiety, growth and pregnancy.

Dr. Cope outlined the diverse protein landscape in India, encompassing cereals and millets, pulses and legumes, dairy and eggs, meat and fish, soy and other plant-based sources, along with emerging sources such as fermented proteins. He explicated the increasing diversification of protein sources and the potential of complementary combinations, such as cereals with pulses, dairy or soy, to improve overall protein quality. He further elaborated on the relevance of high-quality proteins and protein blends across applications including growth, maternal nutrition, muscle health, metabolic health and recovery following hospitalisation or surgery.



Dr. Cope presented research comparing soy and whey proteins, noting that whey is rapidly absorbed and can support an anabolic response, particularly alongside resistance exercise. He referred to a meta-analysis indicating that, when adequate protein intake is combined with exercise, soy and whey can produce comparable improvements in lean body mass and strength. He also discussed a three-month study comparing a soy-dairy protein blend, whey and maltodextrin, in which the soy-dairy blend showed favourable responses in relation to exercise, lean mass and strength. On cardiovascular health, he cited evidence from 88 randomised clinical trials indicating that replacing animal protein sources with soy protein was associated with reductions in cholesterol. He further discussed research examining soy and whey in relation to abdominal fat, metabolic health and insulin response, including an Indian study in pre-diabetic participants in which higher whey intake was associated with a higher insulin response, while glucose responses did not differ significantly between protein groups.

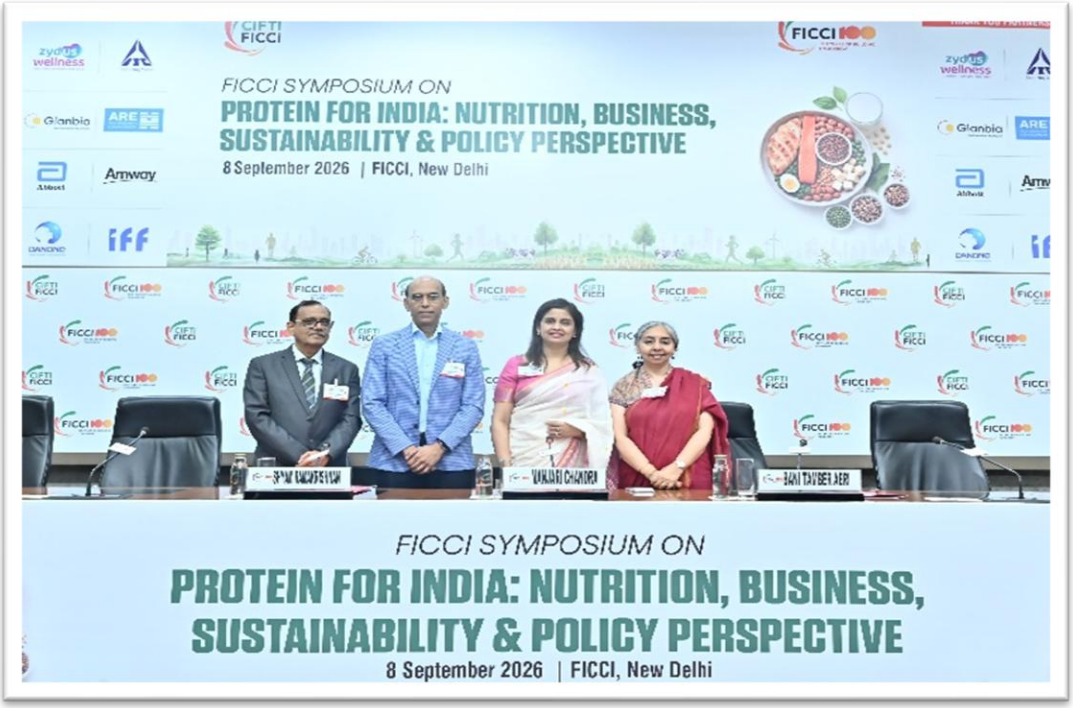
He identified several areas requiring further research, including the long-term effects of higher protein intake on kidney health, differences between plant and animal proteins in insulin sensitivity and metabolic health, and effects on bone, joints and mobility in addition to muscle. He articulated several unresolved questions concerning protein timing, dose and distribution across different population groups, particularly children, pregnant women, older adults and physically active individuals. He further illuminated the possibility of anabolic resistance in older adults and the need to better understand the role of leucine and the rate of protein absorption.

Dr. Cope advocated the careful interpretation of clinical evidence by considering the population, baseline diet, intervention, comparator, outcome and duration, while also assessing sample size, potential bias and statistical methods. He cautioned that findings from studies in young, physically active populations may not be applicable to other groups and that acute responses may differ from longer-term outcomes.

For India, Dr. Cope advanced the case for population-specific research and greater collaboration between researchers and industry, with attention to existing and evolving dietary patterns, food matrices and product formats such as beverages, protein bars and snacks. He underscored the criticality of appropriate study endpoints and timing are essential for translating scientific evidence into effective products and meaningful consumer communication.

In conclusion, Dr. Cope reiterated that protein quality is as important as quantity, with requirements varying across life stages. He elucidated the significance of PDCAAS and DIAAS, dietary diversification, complementary protein sources, fermentation and protein blends. He further urged the need to validate scientific evidence in the final food product and ensure that consumer communication and product claims comply with applicable regulations. Concluding that “quality can substitute for quantity, but quantity will never substitute for quality,” he underscored the importance of high-quality research and collaboration in translating protein science into nutrition that is nutritious, acceptable, affordable and sustainable for India.

Fireside Chat: "The Protein Craze"



Moderator: Dr. Manjari Chandra, Senior Consultant - Nutritional Medicine

Panellist: Dr. Bani Tamber Aeri, Professor, Department of Food & Nutrition, Institute of Home Economics, University of Delhi

Question: *Protein seems to have become the "nutrient of the moment," with everything from breakfast cereals to snacks being marketed as high-protein. How much protein do we actually need to be healthy, and where does the science end and the protein craze begin, whether from a consumer or a manufacturer perspective?*

Response: Dr. Bani Tamber Aeri addressed the growing focus on protein and distinguished actual protein requirements from the current "protein craze." She explained that protein needs are based on maintaining nitrogen balance, with healthy adults requiring approximately 0.83 g/kg body weight, while requirements increase during infancy, growth, adolescence, pregnancy, lactation, ageing and certain disease or surgical conditions.

She reaffirmed that a balanced diet can meet protein requirements and noted that concerns regarding inadequate protein intake among vegetarians can be addressed through consumption of diverse food groups, including pulses, legumes, milk, nuts and oilseeds. She further explicated the importance of complementary protein sources, such as rice and pulses, particularly where diets are predominantly cereal-based.



Dr. Aeri cautioned against focusing solely on the protein content of products such as protein bars and supplements. She stressed the need to consider the overall food matrix, including calories, sugars, salt and saturated fat, particularly in ultra-processed products. While such products may offer convenience when required, she noted that they should not replace a wholesome dietary pattern as a regular part of the diet.

Using almonds as an example, Dr. Aeri contextualised the nutritional and health benefits of food within its overall food matrix, rather than attributing to protein alone, recognizing that other components such as fats and polyphenols may also contribute to its effects. She affirmed the primacy of wholesome, balanced diets over a narrow focus on protein content, particularly when considering supplements, protein bars and other products associated with the current protein trend.

Question: *With the increasing use of GLP-1 medications such as semaglutide for weight management and the management of metabolic conditions, how can dietary protein or protein supplements help meet the nutritional requirements of individuals receiving GLP-1 therapy?*

Response: Dr. Aeri clarified that GLP-1 medications do not directly increase protein requirements; rather, their appetite-suppressing effects can reduce overall food and protein intake. She noted that weight loss may also involve loss of lean body mass, making adequate protein intake important during treatment.

She further cited emerging guidelines recommend protein intakes of up to 1.5 g/kg body weight in certain cases, depending on factors such as the extent of weight loss, appetite levels, and overall clinical condition. She added that treatment-related nausea, vomiting and indigestion may limit food intake and nutrient absorption. In such cases, protein and micronutrient supplementation may provide nutritional support, alongside resistance exercise and physical activity.

In conclusion, Dr. Aeri emphasized that while well-planned diets and mindful eating remain the foundation of nutritional care during GLP-1 therapy, reduced appetite often makes it difficult for patients to meet their dietary requirements. In such cases, protein supplementation can serve as a practical strategy to support adequate nutrient intake, preserve lean body mass, and improve overall nutritional outcomes.

Question: *Protein is often discussed primarily in the context of muscle health, but its role extends beyond muscle and physical function. Could you elaborate on the role of protein and amino acids in cognitive health, mood and mental well-being, and the importance of considering protein within the broader dietary context?*

Response: Dr. Aeri explicated the contribution of amino acids derived from dietary proteins to the synthesis of neurotransmitters such as serotonin and dopamine, thereby supporting various functions related to brain health, signalling and repair. However, she cautioned against attributing mental health

outcomes to protein or individual amino acids alone, noting that conditions such as depression and anxiety are multifactorial in nature.

She conferred that protein should be considered as part of a balanced dietary pattern, alongside micronutrients such as vitamin D, iron, folate and vitamin B6. Referring to evidence including the SMILES trial, she expounded on the significance of overall dietary quality and noted that excessive reliance on individual nutrient supplements may not provide the same benefits as a well-balanced diet.

Dr. Aeri delineated the adverse implications of pro-inflammatory dietary patterns, including diets high in ultra-processed foods, on mental well-being. She posited that nutritional deficiencies should be addressed within the context of the overall diet and that a balanced dietary pattern is fundamental to supporting both physical and mental health. She further alluded to emerging evidence implicating the gut microbiome as an important determinant of this relationship.

Panellist: Dr. Shyam Ramakrishnan, Chief Scientific Officer, Zydus Wellness

Question: *If ICMR indicates that most Indians can meet their protein requirements through a balanced diet, why is there a need for protein-fortified foods?*

Response: Dr. Shyam Ramakrishnan acknowledged that a balanced diet remains the preferred approach to meeting nutritional requirements but noted that actual dietary practices do not always reflect the ideal dietary pattern. Drawing from his experience in research and formulation, he highlighted that individuals with higher levels of physical activity may find it challenging to meet their protein requirements through conventional dietary patterns alone.

He foregrounded the evolving scientific understanding of protein requirements. He explained that the current recommendation of approximately 0.83 g/kg body weight, based on nitrogen balance studies, is being reassessed through newer approaches such as indicator amino acid oxidation (IAAO). He noted that these studies have indicated higher protein requirements than conventional estimates. He articulated the need to consider contemporary scientific evidence when assessing protein requirements and the potential role of fortification.



Dr. Ramakrishnan addressed the importance of protein quality and amino acid adequacy in Indian diets, particularly those predominantly based on cereals. He elucidated how the judicious combination cereals with pulses and other complementary protein sources can help address amino acid limitations. He also drew particular distinction to the nutritional needs of vulnerable groups, particularly older adults, and identified protein fortification as a potentially important intervention where dietary intake is inadequate.

He also referred to emerging research in the Indian population examining the relationship between dietary protein and metabolic health, including. He cited evidence suggesting that replacing lower-quality carbohydrate sources with protein may be associated with a reduced risk of type 2 diabetes and prediabetes, and further advanced the case for population-specific research and collaboration between

research institutions and industry to translate such evidence into practical food solutions and consumer communication.

He articulated the imperative for a more nuanced approach to protein fortification, extending beyond the singular pursuit of higher protein content. He maintained that protein-fortified foods should be developed and communicated with due consideration of protein quantity and quality, dietary patterns, population needs, and supporting scientific evidence.

> **Question**: *In the context of muscle health, could you elaborate on the role of leucine as an essential amino acid in muscle protein synthesis and its significance in determining protein quality, particularly for maintaining muscle mass with advancing age?*

Response: Dr. Ramakrishnan accorded particular significance to protein quality as a key consideration when selecting protein sources or supplements, particularly for supporting muscle health. He highlighted leucine as a critical amino acid involved in muscle protein synthesis (MPS) and noted that its presence is an important determinant of protein quality. He further affirmed that adequate leucine intake becomes increasingly important with advancing age, when the risk of sarcopenia and muscle loss rises.

He averred that protein intake alone is insufficient to maintain muscle mass and must be accompanied by resistance training and physical activity, which are essential for stimulating muscle protein synthesis and effectively utilizing dietary protein. He concluded that preserving muscle health requires an appropriate combination of high-quality protein, adequate protein intake, and regular resistance exercise.

> **Question:** *Protein is often associated by consumers primarily with gym-goers, bodybuilding and muscle building, while its broader clinical and nutritional relevance remains less understood. How can we improve public awareness of the role of protein across different life stages and nutritional needs?*

Response: Dr. Ramakrishnan urged the need for greater consumer education and awareness regarding the role of protein in the diet. He contended that protein should not be viewed in isolation, as fibre, healthy fats and micronutrients also contribute to overall nutritional health. He characterised the burgeoning interest in protein among gym-goers has helped bring the subject into public discussion and could provide an opportunity to broaden consumer understanding.

Drawing from his personal experience, he reiterated the importance of greater awareness of protein requirements across different life stages and physiological conditions, noting that specific requirements may vary considerably. He stressed the importance of empowering individuals to better understand their nutritional requirements while continuing to seek appropriate professional guidance. He posited nutrition literacy as indispensable to informed dietary decision-making, enabling consumers to make more discerning choices for themselves and their families.

Panel Discussion: "Unlocking India's Protein Potential: Addressing Challenges"



Moderator: Dr. Eram Rao, Professor of Food Technology, Bhaskaracharya College of Applied Sciences

Panellist: Ms. Naaznin Husein, CEO and Co-Founder Shamrock Nutrascience Pvt. Ltd.

Question: *When you interact with clients in your clinical practice, do they understand protein as an essential macronutrient with wider roles in the body, or is it still largely associated with muscle building and bodybuilding? How do you address the changing protein requirements across life stages, particularly with increasing age?*

Response: Ms. Husein identified that inadequate protein intake remains a concern despite increasing awareness of nutrition. She attributed that cultural and behavioural perceptions continue to influence dietary choices, with many people associating energy primarily with carbohydrate-rich foods such as rice and roti, while overlooking the role of protein from pulses, dairy and other sources. She called for a concerted effort to address these misconceptions and improve consumer awareness of protein as an important component of a balanced diet.



She expounded upon the role of protein in promoting satiety and supporting better dietary patterns, particularly when incorporated into breakfast. She called for enhanced

awareness and wider accessibility of protein-rich food options, especially among younger populations navigating increasingly demanding lifestyles.

Ms. Husein further articulated the imperative of translating scientific evidence into practical dietary behaviour. While advocating a food-first approach, she noted that supplements may have a role where dietary intake is insufficient due to the practical challenges of meal planning and preparation. She explicated the utility of objective measures, such as hand-grip strength measurements, physical activity assessment and body-composition analysis to monitor changes in muscle mass and fat mass and support adherence to personalised nutrition plans. She enjoined sustained efforts to foster greater public awareness and continued efforts to debunk common misconceptions surrounding protein.

Question: *How can technology and digital tools help address the protein gap in India and generate stronger evidence to support protein recommendations across different population groups and geographies?*

Response: Ms. Husein maintained that the current era of digitalisation and artificial intelligence presents significant opportunities to better understand and address India's protein gap. She posited that the first step is to identify and acknowledge existing nutritional gaps, and that digital tools can play an important role in generating the data needed to assess protein consumption patterns across populations.

She elaborated on the potential of digital platforms and nutrition-tracking applications to provide insights into dietary habits, nutrient gaps and consumption trends at scale. Such tools can help generate India-specific data, which she identified as a critical need for strengthening the evidence base on protein intake and nutritional requirements.

Ms. Husein detailed how digital technologies enable the integration of data on dietary intake, physical activity, physiological indicators, and biochemical parameters, allowing for a more comprehensive understanding of nutrition and health outcomes. She suggested that combining these different data streams could support more targeted and evidence-based nutrition interventions.

She envisaged concerted engagement among stakeholders across nutrition, healthcare, research, industry, and policy to develop a unified understanding of protein nutrition. A more integrated approach, she suggested, would help build a holistic understanding of India's protein and nutrition landscape.

Question: *What should be the key message for improving protein intake among consumers without creating confusion between energy-dense and protein-dense foods?*

Response: Ms. Husein emphasised that traditional Indian foods and recipes are nutritionally valuable, but the proportions on the plate need to be restructured. For example, in a meal such as rajma chawal, the proportion of rajma should be increased relative to rice to improve protein intake while maintaining familiar dietary patterns.

She further addressed the pivotal role of protein in prehabilitation, habilitation and rehabilitation, particularly in hospital and clinical settings. She contended that adequate nourishment and protein intake are essential for supporting recovery, maintaining strength and improving rehabilitation

outcomes. She urged the incorporation of prehabilitation into a broader national framework for wellness and fitness.

Panellist: Dr. Kavitha Ramasamy, Joint Director, Science & Standards, FSSAI

Question: *With India's protein landscape evolving from traditional and conventional sources towards fortified foods, plant-based proteins and other emerging protein sources, is the existing regulatory framework keeping pace with these developments, or is there a need to look at the regulatory approach through a different lens?*

Response: Dr. Kavitha Ramasamy explained that the issue needs to be considered from both nutritional and regulatory perspectives, with attention not only to the quantity of protein but also to its quality, bioavailability and accessibility. She noted that Indian diets have traditionally relied heavily on cereals and plant-based foods, which may provide lower-quality protein, while the presence of anti-nutritional factors can also affect the availability of essential amino acids.

She highlighted the importance of balanced nutrition, noting that protein requirements should be considered in the context of the overall dietary pattern rather than through excessive reliance on protein powders or supplements. She emphasised that protein quality and bioavailability should be considered alongside quantity.



From the regulatory perspective, Dr. Ramasamy stated that FSSAI has established standards and safety requirements for conventional protein sources and has provisions covering emerging categories, including plant-based proteins, dairy analogues, nutraceuticals and products involving novel technologies. She clarified that while voluntary fortification provisions apply to micronutrients, enrichment is permitted under the applicable regulatory framework.

She further explained that nutritional parameters and protein-related claims are governed by the applicable labelling and claims regulations. Claims such as "source" and "high" or "rich" are subject to prescribed requirements. While protein quality is not uniformly mandated for every food business operator, claims relating to digestibility or bioavailability require appropriate and authentic scientific literature for substantiation and regulatory consideration.

Question: *To unlock India's full potential in addressing protein nutrition, what role can industry, academia, scientific institutions, and regulators play in generating stronger India-specific evidence on protein requirements, quality, bioavailability, and health outcomes?*

Response: Dr. Kavita Ramasamy accentuated the need for a collaborative, multi-sectoral and science-led approach involving scientific institutions, healthcare professionals, academia, research institutions, regulators and industry. She noted that such collaboration is essential to support nutrition education, promote diverse protein sources and develop affordable, nutritionally appropriate protein solutions.

She accorded particular importance to research on the digestibility and amino acid quality of native Indian foods, taking into account local culinary practices and dietary patterns rather than relying solely

on international data. She also articulated the imperative of conducting large-scale dietary consumption studies across regions, socioeconomic groups, and lifestyle segments to better understand actual protein intake and nutritional gaps among Indians.

Dr. Ramasamy also called for research on protein metabolism, body composition, amino acid utilization, and the impact of traditional and modern processing methods on anti-nutritional factors. She propounded the need for clinical studies to evaluate the role of different protein sources in outcomes such as muscle protein synthesis, body composition and overall health, as well as investigations into the protein quality of traditional food combinations and emerging protein sources.

From the industry perspective, she delineated opportunities to develop culturally acceptable, affordable and innovative protein products using emerging technologies to improve protein quality and reduce anti-nutritional factors. She also emphasised the importance of generating and sharing safety, efficacy and post-market data to support regulatory evaluation and better understand consumer preferences and demand.

She affirmed that regulators can facilitate this process through existing scientific panels and committees, while continued collaboration among stakeholders can support nutrition education, dietary diversification and the development of evidence-based protein solutions for India.

Question: *From a regulatory perspective, what measures are required to support the development of novel and emerging protein products while ensuring their safety, efficacy, and appropriate labelling?*

Response: Dr. Ramasamy articulated the imperative to strengthen the evaluation of novel protein products and ingredients. She outlined how the existing regulatory framework for non-specified foods provides for the assessment of novel technologies and products based on safety, efficacy, toxicology, and nutritional adequacy. However, regulatory preparedness must continue to evolve in tandem with scientific and technological developments, particularly as new sources of protein continue to emerge.

She further emphasised the need to create a scientific evidence repository through collaboration among ministries, scientific institutions, and other stakeholders. She also identified the need for greater regulatory clarity regarding the nomenclature and labelling of products such as meat analogues, dairy analogues, and plant-based foods, while ensuring their safety and efficacy.

Panellist: Mr. Zafar Khan, Director, Regulatory Affairs, Abbott Nutrition

Question: *Most protein labelling in India currently focuses on quantity, particularly grams of protein per serving. Is it feasible for regulation to also account for protein quality? If so, what would this require in terms of testing standards, industry preparedness, and consumer communication?*

Response: Mr. Khan stated that incorporating protein quality into regulatory frameworks is both scientifically desirable and feasible, although it is not currently mandatory across all food categories. He noted that food businesses and researchers can consider the intended consumer group while designing products and determining the appropriate nutritional characteristics and claims.

He identified the imperative of striking a balance between food adequacy and nutrient adequacy, while recognizing that regulatory frameworks continue to evolve alongside advancements in science and technology. Where protein-related claims are made, appropriate testing methodologies and scientific substantiation are required to support such claims. He also affirmed that product labels should be clear, consumer friendly, and compliant with applicable regulations to facilitate informed consumer choices.



On consumer choice, Mr. Khan highlighted labelling as an important tool for communicating relevant nutritional information. He noted that greater consumer awareness is needed regarding not only the quantity but also the quality of protein, and suggested that broader awareness initiatives could help consumers better understand protein requirements and make informed choices.

> **Question:** *We find that some labelling terms, such as "plant-based," "high protein," and "protein enriched," which are increasingly being used in the marketplace, can be confusing for consumers. How can specific regulatory changes help standardize these claims, and how challenging would it be to implement and enforce such requirements in the larger interest of consumers?*

Response: Mr. Khan underscored the need for greater clarity, consensus, and stakeholder alignment in defining emerging protein-related terminology. He maintained that clear and standardized definitions are essential to minimize ambiguity and ensure consistent interpretation across industry, regulators, and consumers.

He suggested that establishing objective criteria and thresholds for protein-related claims would be an important step towards standardization. In this regard, scientific measures of protein quality, including DIAAS, PDCAAS, and digestibility assessment tools, could support the development of evidence-based criteria for the use of specific nutrition claims and descriptors.

Mr. Khan averred that while establishing consensus on definitions and criteria for protein-related claims is achievable through stakeholder consultation, building the scientific evidence base and implementation infrastructure will require time and sustained effort. He contended that regulatory frameworks must continue to evolve alongside advances in science and emerging technologies.

He reaffirmed that the successful standardization of protein-related claims will depend on clear criteria, scientific substantiation, and broad stakeholder consensus, ensuring that consumers receive accurate, meaningful, and reliable information when making food choices.

> **Question:** *From a regulatory perspective, what broad reforms are urgently required to provide greater scope for innovation and expansion within the alternative protein industry?*

Response: Mr. Zakir accentuated the need for clear regulatory pathways for alternative proteins and other complex, innovative products to enable faster evaluation and approval. He maintained that requirements for data generation and evidence should be clearly defined for food business operators from the outset.

Drawing on international regulatory practices, he proposed establishing a scientific advice mechanism that would enable companies to engage with regulators at an early stage, discuss their proposed innovations, and obtain clarity on the scientific evidence and datasets required for regulatory

evaluation. He affirmed that India's regulatory framework should align with national nutrition priorities to support the broader goal of meeting the nutritional requirements of the population.

Panellist: Dr. Sangeeta Goomer, Co-Founder Future Bites and Former Professor Dept. of Food & Nutrition, Lady Irwin College.

Question: *How can science and technology be leveraged to develop affordable, culturally acceptable, nutritionally balanced, and sustainable protein solutions that address both current and future protein requirements in India?*

Response: Dr. Goomer emphasized that India's priority is not merely increasing protein availability, but ensuring that high-quality protein is affordable, accessible, and acceptable to consumers. She highlighted the importance of nutrition literacy, particularly at the school level, to build awareness of protein quality and balanced diets from an early age.

She noted that the traditional Indian thali provides a nutritionally balanced model through complementary combinations of cereals, pulses, dairy, and vegetables. However, changing lifestyles have created a need for convenient, protein-rich products based on locally available ingredients and culturally familiar food combinations that can cater to diverse consumer groups.



Dr. Goomer also identified opportunities to improve the protein content of everyday foods through the use of ingredients such as sattu, gram flour, pulses, and nutrient-rich local foods. She lent particular weight to protein quality, digestibility, and appropriate food combinations, while recognising the increasing relevance of clean-label and plant-based protein solutions.

She further advocated for data-driven and localized approaches, including the use of AI and demographic data to identify protein gaps and develop region-specific nutrition solutions. As an innovative approach to accessibility, she suggested creating "nutrition points" that make affordable protein-rich options such as roasted chana, sattu drinks and protein-rich chikkis readily available to consumers at low price points.

Dr. Goomer concluded that future protein strategies should integrate scientific innovation with traditional dietary knowledge to create practical, affordable, and culturally relevant solutions that support both nutrition and sustainability goals.

Question: *If India is to strengthen its protein security in a sustainable manner, particularly with regard to improving protein quality, what should be the key priority to ensure long-term benefits for future generations?*

Response: Dr. Goomer accorded primacy to improving literacy and awareness about local Indian foods should be a key priority for strengthening India's protein security. She advocated introducing nutrition education at the school level and engaging both children and parents to improve understanding of balanced diets and appropriate protein intake.

She further elucidated the potential of drawing on the principles of the traditional Indian thali to develop innovative food solutions that address protein quality through appropriate amino acid balancing and improved digestibility. She encouraged young researchers to build on indigenous foods and dietary practices while generating evidence based on the nutritional and physiological needs of the Indian population rather than relying solely on data from other populations.

She envisaged the convergence of nutrition literacy, traditional food wisdom, and scientific innovation as critical to advancing India's protein security in a sustainable manner.

Panellist: Mr. Praveer Srivastava, Executive Director, Plant Based Foods Industry Association (PBFIA)

Question: *Plant-based proteins are often associated with challenges related to protein quality, digestibility, and the presence of anti-nutritional factors. How can science, technology, and food-processing interventions help improve the digestibility, nutritional value, and utilisation of plant-based and alternative proteins?*



Response: Mr. Srivastava explained that concerns related to anti-nutritional factors can be addressed through both traditional food-processing practices and modern food technologies. He noted that processes such as soaking, cooking, and other primary processing methods can help reduce factors such as trypsin inhibitors and phytates, thereby improving nutrient availability. He further expounded upon the role of technologies such as fermentation and extrusion in enhancing the digestibility and nutritional quality of plant-based protein products.

He contended that plant-based proteins should not be viewed solely through the lens of their limitations, but also in terms of their nutritional and health benefits. He also accorded particular significance to nutrition awareness, particularly regarding appropriate preparation and consumption practices, to enable consumers to derive maximum benefit from plant-based protein sources.

Question: *When you look at the triple burden of malnutrition in our country, which includes protein deficiency, how can we develop an enabling ecosystem that expands consumer access to diverse, affordable and sustainable plant-based proteins, while also strengthening resilience in agricultural productivity?*

Response: Mr. Srivastava highlighted the importance of the four A's: availability, accessibility, affordability, and acceptability in expanding access to plant-based proteins. He noted that although India is a major producer of pulses, rice, soy, and millets, a significant proportion of processed protein ingredients, including isolates and concentrates, continues to be imported, increasing costs and limiting affordability.

He accentuated the imperative of strengthening domestic manufacturing capacity, processing infrastructure, and value chains for plant-based protein ingredients to enhance both affordability and

accessibility. He elucidated the potential of incorporating protein through traditional food formats, regional cuisines, and familiar dietary practices, thereby fostering greater consumer acceptance.

Mr. Srivastava further affirmed that greater nutrition literacy, India-specific research, and policy support are essential to addressing gaps across the protein value chain. He called for coordinated efforts among industry, government, and research institutions to strengthen the plant-based protein ecosystem and improve access to affordable, protein-rich foods for consumers across the country.

Question: *How can India unlock the potential of plant-based proteins and make them resilient, sustainable, and attractive to consumers?*

Response: Mr. Srivastava emphasised that creating demand for protein requires greater consumer awareness and nutrition literacy. He highlighted the potential of digital platforms and nutrition applications to reach a wider population, generate awareness, and translate increased understanding into consumer demand.

He noted that stronger demand would encourage greater investment, support industry growth, and improve access to nutritious protein products. He concluded by stressing the need to bring plant-based protein into the national mainstream as an important component of India's health and nutrition agenda.

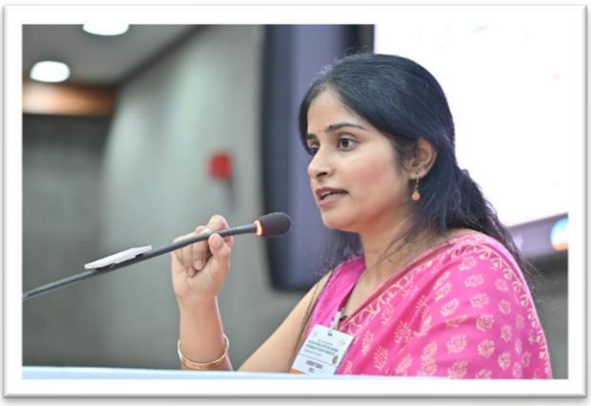













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