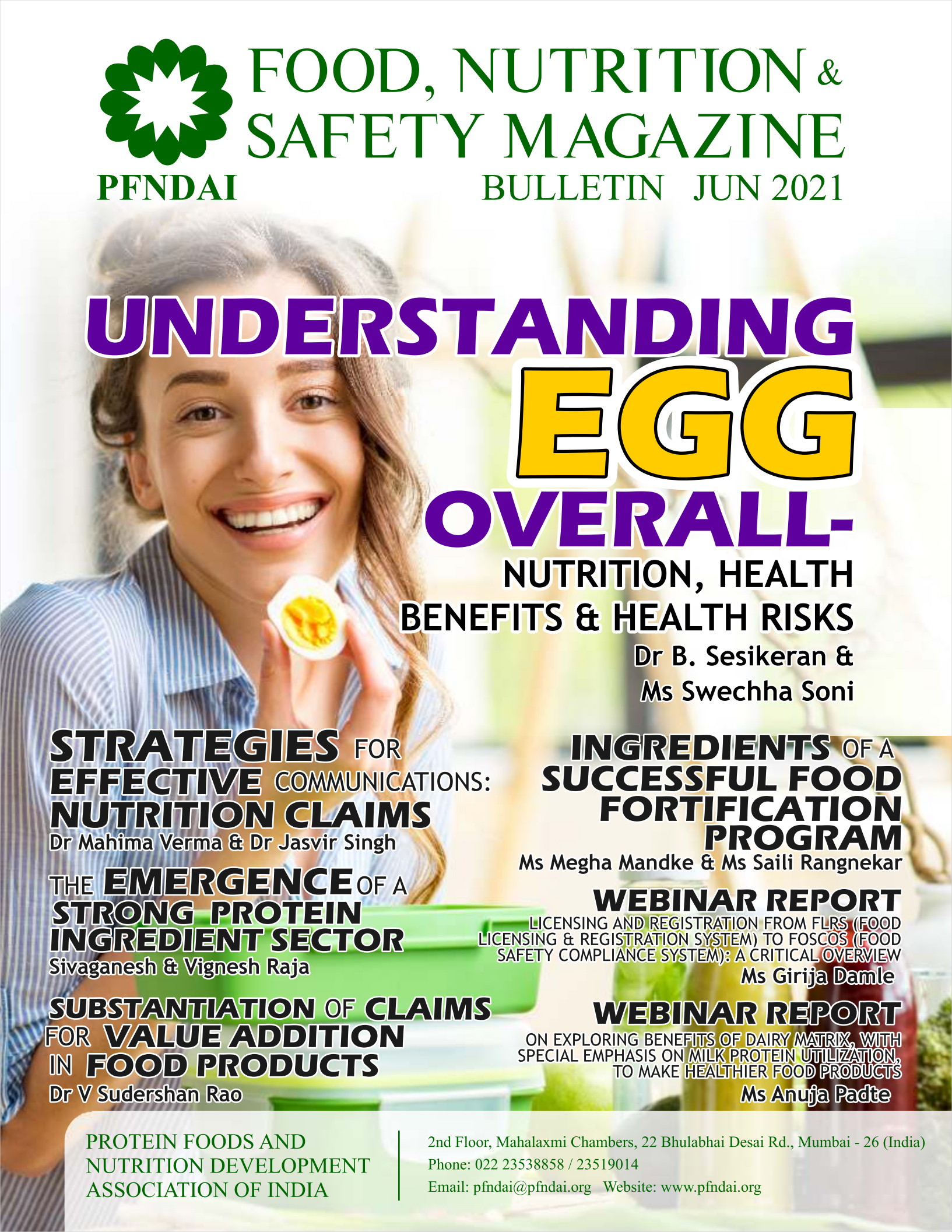
PFNDAI

FOOD, NUTRITION & SAFETY MAGAZINE

BULLETIN JUN 2021



UNDERSTANDING EGG OVERALL- NUTRITION, HEALTH BENEFITS & HEALTH RISKS

Dr B. Sesikeran &
Ms Swechha Soni

STRATEGIES FOR EFFECTIVE COMMUNICATIONS: NUTRITION CLAIMS

Dr Mahima Verma & Dr Jasvir Singh

THE EMERGENCE OF A STRONG PROTEIN INGREDIENT SECTOR

Sivaganesh & Vignesh Raja

SUBSTANTIATION OF CLAIMS FOR VALUE ADDITION IN FOOD PRODUCTS

Dr V Sudershan Rao

INGREDIENTS OF A SUCCESSFUL FOOD FORTIFICATION PROGRAM

Ms Megha Mandke & Ms Saili Rangnekar

WEBINAR REPORT

LICENSING AND REGISTRATION FROM FLRS (FOOD LICENSING & REGISTRATION SYSTEM) TO FOSCOS (FOOD SAFETY COMPLIANCE SYSTEM): A CRITICAL OVERVIEW

Ms Girija Damle

WEBINAR REPORT

ON EXPLORING BENEFITS OF DAIRY MATRIX, WITH SPECIAL EMPHASIS ON MILK PROTEIN UTILIZATION, TO MAKE HEALTHIER FOOD PRODUCTS

Ms Anuja Padte

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INDEX

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EDITORIAL

Indian frozen food industry is maturing.

A decade ago, what was available in the market were such things as frozen French fries and a few frozen vegetables. Over the years more and more products started appearing to make things convenient and also available out of season and as near fresh as possible.

This transformation has been helped by many factors. Among them, modern retail outlets like Food Bazaar, DMart, and Star Bazaar as well as online grocery outlets like Big Basket, Groffers and others have helped substantially. Frozen foods, although are processed, are unlike other processed foods in the sense that they commonly are devoid of preservatives and other additives that are usually added to many processed foods. The low temperature is sufficient to prevent the growth of microbes that cause either spoilage or diseases. So, they do not need preservatives.

Frozen fish and seafood as well as frozen meat and poultry products have been exported from India in sizeable amounts but there were hardly noticeable amounts in domestic market. The scenario has changed now and one not only sees many of these products which are cleaned and sectioned but also those that are wellmarinated with various marinades and are available in frozen state. This not only saves a lot of work but there are other benefits as well.

Fresh animal products market has a lot of hygiene problem. When these are brought home, they need to be sectioned and cleaned which leaves a lot of smelly residues. With frozen there is hardly any residue. Manufacturers have also gone ahead and are offering marinated sectioned and cleaned pieces which only need to be pan fried to prepare the meal. Again, these products do not contain any preservatives or other additives. Thus, they have clean labels.

More recently even further processed and prepared foods have appeared which need only heating in either the oven or pan to finish. Last couple of years have seen a large variety of such products appearing in consumer market. Meat, poultry and fish products are available as well as many vegetable and pulses curries are available in frozen format which only require finish heating to make them.

Even parathas are available in veg and non-veg varieties. Most have clean label as can be seen by two examples here, one is chicken kheema paratha and the other masala mackerel.

INGREDIENTS:
Chicken Meat 25%, Atta with Multi Grain Flour, [Whole Wheat Atta, Defatted Soya Flour, Oat Flour, Psyllium Husk Powder, Maize Flour, Bengal Gram Flour], Onions, Tomatoes, Water, Sunflower Oil, Green Chillies, Coriander Leaves, Ginger, Garlic, Iodised salt, Mixture of Spices and Condiments.

All the advantages including convenience, safety, minimal additives, high quality and acceptability in terms of taste, flavour and appearance have contributed to rapid growth of the market.

Another big factor has been availability of cold chain from farm to factory and to consumers, which allows high quality material being received at factories for freezing. They have a shelf life of several months so one can use them as and when needed.

Frozen industry also withstood the rigors of the current pandemic and has given the consumers steady supply of good quality products, which are safe. These products not only have a tremendous domestic market scope but also export potential. So,government should consider encouraging this industry. There can be availability of solar powered cooling and freezing equipments that would make the cost even more affordable to consumers.

The future is quite bright for this industry.

Prof Jagadish Pai,
Executive Director,
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UNDERSTANDING EGG OVERALL- NUTRITION, HEALTH BENEFITS & HEALTH RISKS

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Most of us are die-hard fan of consuming eggs and like to have it in different forms. May it be scrambled egg, omelet, egg gravy or having just boiled egg. It is enjoyed in all its forms. Many like it for its taste while some consume it for the fact that it is high in protein.

It is often majorly associated with sports people as it is said to be high in nutrition which helps in the health and body maintenance of those. But what are these nutrients? Does it only possess protein in high amounts, as protein is one such nutrient, which is always in the limelight when we talk about eggs. Or is there any hidden treasure of more nutrients that must be explored? It is important to understand what all these nutrients are and how are they distributed among the white and yolk of the egg.

Egg is known to be the symbol of perfection as it has almost all the nutrients of benefit to mankind with an affordable source of high-quality protein, iron, unsaturated fatty acids, phospholipids, and carotenoids.

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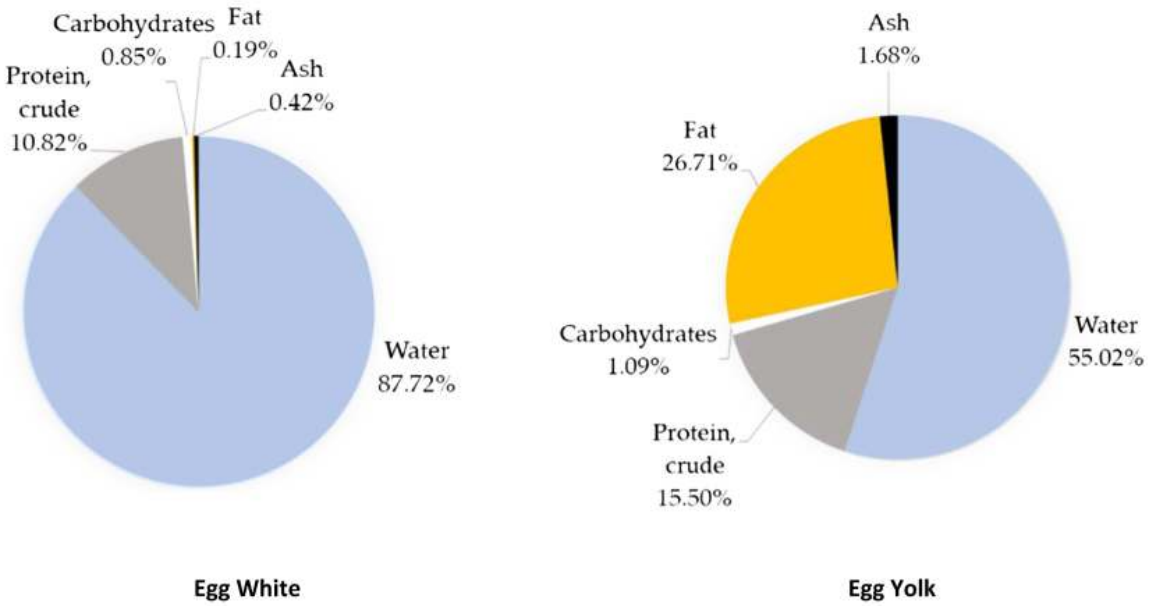

Rehault-Godbert et al Nutrients; 2019.11 684

Nutrition Profile:

The above figure represents the nutrient components present in both egg white as well as egg yolk and it can be seen that the next thing present in higher amount after water in egg white is protein and fat in egg yolk. Protein to be particular is present in both white as well as yolk adequately. So whether we consume egg white or yolk we are definitely getting some good quality protein and in good amounts.

Egg white Protein Components:

One egg contains about 6gms of protein. Most of us only know about albumin as the egg protein but in reality there are different categories of protein present.

- Ovomucin (OVM)- These are the structural proteins which plays a significant role in egg allergy
- Glycoproteins- These are the major proteins in eggs (about 50%)known as Ovalbumin (OVA) and it is one of the best quality proteins which is used as a reference protein used in the measurement of quality of other proteins from other sources.
- Ovotransferrin (OVT)- This protein binds to iron and plays important role in preventing infections
- Avidin- This protein has a very strong affinity to biotin. In fact, in the basic biochemistry the strongest bond is the Avidin biotin binding.
- Protease Inhibitors
- Antibacterial Lysozyme
- Bioactive peptides
- 150 distinct proteins have been identified (Gautron, J et al 2011)

Digestibility of egg proteins

One of the greatest advantages of egg protein over other vegetarian proteins is the higher digestibility of the egg protein. The digestibility of a cooked egg protein is approximately 91% whereas the digestibility of a raw egg is approx. 51%

Lipid composition of egg yolk

The total fat that comes from whole egg is roughly around 5-6gms of which the fat content of egg yolk is about 27-30% along which about 200mg of cholesterol also comes in. Of this cholesterol the LDL cholesterol is 68% and the HDL cholesterol is 16%. The major fatty acids present in the egg are the palmitic and stearic acids. There are more unsaturated fatty acids present in egg fat than the saturated fatty acids. Raw yolk contains about 8.5g of saturated fats, 10.0g of MUFA, and 3.2g of PUFA for every 100 grams of egg. (IFCT ICMR NIN 2017). The egg also contains 180mg/ 100g of DHA, which is known best for the brain development of child and reducing neuro-degeneration in adults. The omega-6 in the egg comes from linoleic acid and is almost around 3g/ 100g of egg yolk which is roughly around 1.5g per egg. One thing to be noted is that hen's diet cannot change total lipid content of the egg but can change fatty acid composition or ratio of White: Yolk. (Rehault-Godbert et al Nutrients;2019.11 684). It is also observed that no other non-vegetarian food has as much unsaturated fats as present in eggs.

Phospholipids

We all know how important phospholipids are for cell membrane integrity as well as for brain. Egg is a rich source of phospholipids giving 1.3g of it per egg and these are highly bioavailable phospholipids like phosphatidyl choline. These phospholipids get incorporated into the HDL particles. There are few studies which shows that if you eat eggs in sufficient quantities, it can actually help elevate the HDL cholesterol levels because these phospholipids will go and bind to the lipid particles in the blood and raise the HDL level. These will also benefit patients with metabolic syndrome because low HDL is one of the characteristics of people with metabolic syndrome so eggs will help in elevating HDL levels in such people too.

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Carotenoids

The content of the carotenoids in the egg is dependent on the diet of the hen. Common carotenoids present in the egg are lutein, zeaxanthin, beta carotene, alpha carotene, beta cryptoxanthine. These are also available in plenty from vegetable sources but the bioavailability of these carotenoids coming from egg is higher than those which come from the other vegetarian sources. In a study, in subjects with metabolic syndrome, increase in plasma lutein, zeaxanthin and beta carotene were observed on consumption of 3 eggs per day for 3 weeks. (Blesso et al Food Funct 2013)

Micronutrients

Eggs contain all the vitamins except vitamin C. So, clubbing one egg with a citrus fruit will give you all the micronutrients. Roughly 2 eggs per day may provide approx.10 to 30% of estimated average requirement of most of the vitamins. There are differences in the micronutrient content of egg yolk and the white. The yolk is rich in all the fat-soluble vitamins A, D, E, K as well as B vitamins- B1, B2, B5, B6, B9, and B12. On the contrary egg white doesn't have the fat-soluble vitamins but consists of all the B complex vitamins- B1, B6, B8, B9, and B12. Eggs are also very rich source of choline.

Minerals and Trace elements

Apart from vitamins eggs also contains some minerals and trace elements. They are rich in Phosphorus, Calcium and Potassium and trace elements- Cu. Fe, Mg, Mn Se and Zn. The concentration of these minerals and trace elements are dependent on the diet the hen has received.

Properties of Bioactive molecules in egg

Eggs contain antibacterial molecules like lysozyme, ovotransferrin. As mentioned above ovotransferrin binds to iron and hence prevents bacterial growth. Vitamins & minerals present in egg acts as the antioxidant. There are antihypertensive molecules present in eggs which are the Angiotensin converting enzyme (ACE) inhibitory peptides. There are also immuno-modulatory peptides present e.g. the egg white pleotropin. Then there are also ovomucin and other derived peptides that act as anti-cancerous agents. It has been lately identified that there are about 550 bioactive substances present in the egg of which the functioning of only 20 bioactives are known.

Adverse effects of egg consumption

Hen's egg protein allergy is the second most common allergy among infants and children, the first one being the milk protein. It affects around 0.5 to 2.5% of children (Rona RJ, et al. J Allergy Clin Immunol. 2007).

The allergy could be of two forms- one is IgE mediated which is the one that cause mass cell degranulation which is sometimes referred to as anaphylactic shock or severe forms of allergy while other being the cell mediated one where the allergy occurs slowly over a period of time and generally not life threatening.

Most of the allergens are present in the egg white though the yolk can also potentially have some. The allergens present in the egg are the ovomucoid, ovotransferrin, ovalbumin and lysozyme. Either of these can cause allergy.

The peculiarity about these allergic proteins is that these proteins don't get digested in the stomach or in the intestine and are also heat stable which having a cooked egg can still cause allergy. Children who are persistently allergic i.e. they have allergy over the lifetime whenever they consume egg, have IgE antibodies which have a small template in them which immediately recognises a particular sequence of amino acid on the ovomucin. So, the moment the egg is consumed, it will identify it and immediately cause mass cell activation and will cause acute allergic reactions. Children who have transient allergy i.e. they get the allergy sometimes, while sometimes they do not, are not IgE mediated allergies.

Ovalbumin epitopes are heat labile so the allergy will be only when raw egg is consumed and there will be no allergy on consumption of cooked egg. There are also allergic yolk proteins called alpha-Livetin and Vitellenin.

Processed foods very often use very little egg lecithin which is not known to cause any allergic reactions. Children who develop egg allergy at later years also develop a more serious allergic problem called Atopic dermatitis. Flu vaccines derived from chick embryos may have residual OVA or OVM (Caubet and Wang, Ped Clin North Am; Apr 2011)

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Egg consumption and Cardiovascular disease

In the past it was widely recommended that limiting dietary cholesterol intake to not more than 300 mg per day of which one egg contains 200mg, meaning more than one egg should not be consumed to prevent cardiovascular disease. However, over the years, the data showed that there is a very weak association between dietary cholesterol and blood cholesterol, which means irrespective of the amount of cholesterol taken through diets, the blood cholesterol may not shoot up. It was later concluded that the dietary cholesterol is no longer a nutrient of concern for overconsumption. So, in 2015, dietary guidelines for Americans did not carry forward this recommendation.

However, various studies have shown conflicting results of effect of egg consumption on CVD. Some of the studies and their interpretations are as follows:

- No association between egg intake and risk of cardiovascular disease ((Diez-Espino J, et al Clinical nutrition 2017; Djousse L and Gaziano JM.. Am J Clin Nutr2008; Hu et al. JAMA 1999)
- Higher risk of CVD on egg consumption (Zhong et al. JAMA, 2019, Guo et al Eur J Nutr2018)
- An inverse association of egg consumption with cardiovascular disease (Guo Y, et al, Heart2018, Key et al Circulation 2019)

The Final Word:

The research on eggs is contradictory for now, so people (and their doctors) must personally decide how many eggs is too many. Those who are already at risk of cardiovascular issues may want to be more cautious than those who aren't, especially if they have a family or medical history of heart disease. Your doctor can help define the right range for you. But in the end, we must all note that counting of eggs in the diet is one part, moving to overall healthier dietary patterns and healthier lifestyle is the key to stay away from most of the diseases.

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STRATEGIES FOR EFFECTIVE COMMUNICATIONS: NUTRITION CLAIMS

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In this fast-paced lifestyle, technology has a huge impact on the knowledge exchanged at global level. Where the understanding of the need for appropriate nutrition and balanced food is prevalent, consumer is aware that the concept of 'one size fits all' is obsolete. In a globalized knowledge intensive world, consumers tend to make purchasing decisions based on the information available to them. The requisite 'personalized nutrition' notion is propelling the consumers to collect more and more information. The need for improved strategies and tools for communication about food risks and benefits is therefore paramount.

The need of claims

According to the definition by FSSAI, 'claim' means any representation which is printed, oral, audio or visual and states, suggests, or implies that a food has qualities relating to its origin, nutritional properties, nature, processing, composition or otherwise. Among the claims that can be used on food and dietary supplement labels are three categories of claims that are defined by FDA: health claims, nutrient content claims, and structure/function claims.

Besides the general product and nutritional information, claims are becoming important tool in engaging with consumers.

Consumers and markets are at various degrees of development, both concerning their capacity to understand claims and enforce very complex mechanisms. Consumers gather information about the foods from a wide assortment of sources, such as family/conventional knowledge, education, the media and advertisements, food product labels etc. Thus, the aim is to propose a clearer informative system that effectively improves consumer awareness on proper nutrition. Claims assist the linkages with nutritional and health benefits in becoming stronger. This is a platform for educating consumers about nutrition and leading informed purchasing decisions.

Claims: A Landscape of Controversies?

Claims are either looked up sceptically as marketing gimmicks used by food business operators, or potential contribution to the achievement of public health objectives. Anyhow, they are an important way of communicating benefits of science to the consumers. Markets are flooded with food products holding variety of claims and consumers are often confused to make sense out of them. An environment of trust is required to fill the gap, where consumers believe in truthfulness of claims being made.

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Regulatory frameworks have this very important role to play in creating this environment of trust by providing a transparent framework of governance for nutrition and health claims, so that only well substantiated claims reach the market place. It is only this trust, which can help realize the health benefits of scientific developments, both for marketers and consumers alike.

Science of Communication v/s Communication of Science:

Claims can also be looked as a form of communicating science. Nutrition, health or any other claims are communicating scientific data and evidences. Studies have been carried out around nutrition and health claims in consumers' perception to model effective communication plan for creating educational paths resolving information asymmetries caused by promotion and marketing activities regarding foodstuffs.

General communication principles remain valid for claims as well. These include:

- Customer Segmentation is a reality
- Reaction to loss v/s gain
- Difference between what you say v/s what is heard v/s what is understood
- Test messaging

After communication comes the 'Interpretation' of the claim. How a consumer perceives any claim? Scientific communications have been challenging as science is complex and simplification may lead to incorrect scientific understanding. The demand of wide range of convenient and tasty food is high and the consumers behave picky if healthier choices are available. However, with advances in nutritional science and food technology, the consumer has become overwhelmed with confusing health claims and mixed marketing messages for foods.

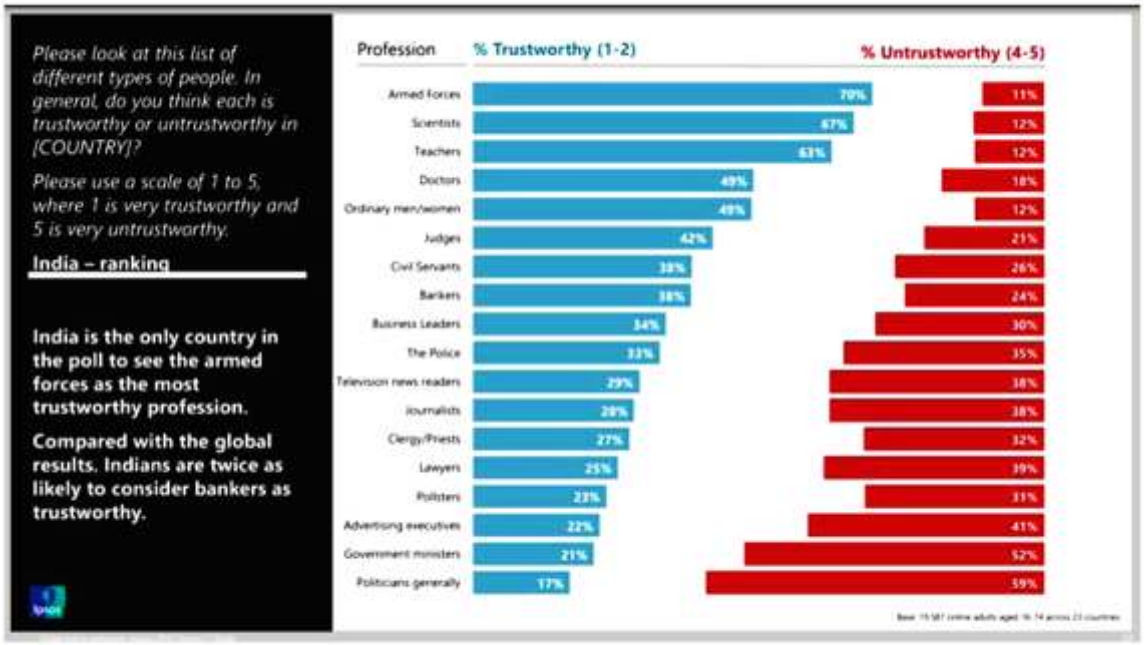
The Messenger

As indicated by Global trust in professions trustworthiness index, 2019 based on an online survey across 23 countries, it was discovered that scientists are the most trustworthy in 12 countries, doctors in eight, and teachers are considered most trustworthy in three countries. Countries like Russia, Argentina, Germany, Hungary, Italy, Japan, South Korea, Saudi Arabia, Mexico, Poland, Sweden and Turkey considered scientists as the most trustworthy profession. Doctors are the most trustworthy for citizens of Australia, Belgium, Canada, France, Great Britain, South Africa, Spain and Sweden (where they are tied with scientists) and Teachers for Brazilians and Americans. Indians see armed forces members as the most trustworthy profession and for China it is the police. It is Human conduct that we believe in a few groups and not others, and the impact this has regarding what we accept or don't.

We live in a world where proven facts, verifiable data, and actual truths are freely and widely available. In this scenario, the messenger makes a major impact on consumers' perception and influencing purchasing decisions. In an age of complete transparency, buyers are no longer swayed by traditional sales and marketing tactics. Instead, they want to be guided by the advice of trusted peers. To identify the appropriate messenger, the challenges for FBOs are: First, they should be acknowledged by their intended interest group as viable messengers. Second, their message should be reasonable to the perspective of their audience members. Third, the community they are shaping should be a legitimate type for their audience.

Responsible Claims: Guidance in FSS Act, 2006

Besides the messenger, it is the responsibility of the FBO to provide information to the consumers, which is truthful and not misleading. According to Section 23 of the Act, Packaging and labelling



Ref: IPSOS, 2019 (www.ipsos.com)

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of foods: it is given "Provided that the labels shall not contain any statement, claim, design or device which is false or misleading in any particular concerning the food products contained in the package or concerning the quantity or the nutritive value implying medicinal or therapeutic claims or in relation to the place of origin of the said food products."

The general guidance for claims is specified under Food Safety and Standards (Advertising and Claims) Regulations, 2018. It states:

- Claims must be truthful, unambiguous, meaningful, not misleading and help consumers to comprehend the information provided
- Claims shall not encourage or condone excess consumption of a particular food
- Claims shall not state, suggest or imply that a balanced and varied diet cannot provide appropriate quantities of nutrients as required by the body
- Where the claim benefit is related to or dependent on the method of preparation of the food the same shall be provided on the label
- Claims shall specify the number of servings of the food per day for the claimed benefit
- The claim shall be scientifically substantiated by validated methods of characterizing or quantifying the ingredient or substance that is the basis for the claim
- All disclaimers related to a claim shall be conspicuous and legible
- Advertisements shall also not undermine the importance of healthy lifestyles
- Advertisements for food or beverages shall not be promoted or portrayed as a meal replacement unless otherwise specifically permitted as a meal replacement under regulations

Generic Guidance on Scientific Substantiation:

- Consider regulatory guidance documents on the submission and substantiation of claims
- Consider the novelty of the food/constituent and the science providing the evidence and if the safety of a food/constituent is systematically addressed
- Ensure pertinent data is captured in substantiation dossiers, weather required by regulatory authorities or as part of self-regulatory due diligence framework.
- Look at data protection if scientific substantiation is primarily based on companies' own data
- Ensure that the food/constituent can be sufficiently characterized
- Wording of claims must reflect the scientific evidence
- Evaluate if regulations require substantiation of a health claim through human efficacy studies
- Ensure quality of randomized clinical trials through all GCPs
- The proposed conditions of use should reflect the conditions in which the studies used for substantiating the claim were conducted
- Always summarize the totality of scientific evidence

Making Claims: Critical Questions

A noble claim is a balancing act linking customer needs, meeting organization's goal, and staying true to the facts. To make a claim, the following critical questions need to be addressed before making a claim:

Effectiveness: Will it help the brand/product? Will this claim turn into real revenues?

Credibility: Are we compliant on explicit + implicit expectation? Do we have all requisite pre-market approvals?

Communication: Who is talking to whom?

Most important is engagement with all stakeholders' viz., product/R&D, sales, brand, and insights.

Understanding Consumer Behaviour

A consumer lacks the expertise to differentiate between nutrition claims and health claims as regulatory personnel. This makes communication challenging, since the consumers should not only understand the content of the claim, but also the relevance of the claim to themselves. For successful claim architecture, it is vital to understand consumer's perception, which is based on three key dimensions as proposed:

(1) Familiarity with the nutrient, ingredient or food stated in the claim: Consumers have a preference of carrier products and added ingredients, which may be country specific. New functional ingredients, where associative beliefs had not yet formed, are an opportunity to educate the consumer.

(2) Statement type in terms of simplicity/complexity: A claim must be clear, simple and understandable by the consumer. Complex claim language causes confusion and may lead to rejection.

(3) Relevance of the claim: Consumers hold preferences over the types of benefits mentioned in the claims either personally or for a stated population group.

Gender stratification has revealed that women, in general, are more positive than men about products with health claims. The information in a claim is needed to convince a consumer, who can be categorized as 'benefit only' group and 'know all' group. The former is convinced by short precise claims describing the function or the health outcome whereas, for the latter, long claim sentences delivering the whole chain of information from ingredient via function to health outcome is convincing. Previous exposure to health claims also facilitates the ability to process the information in

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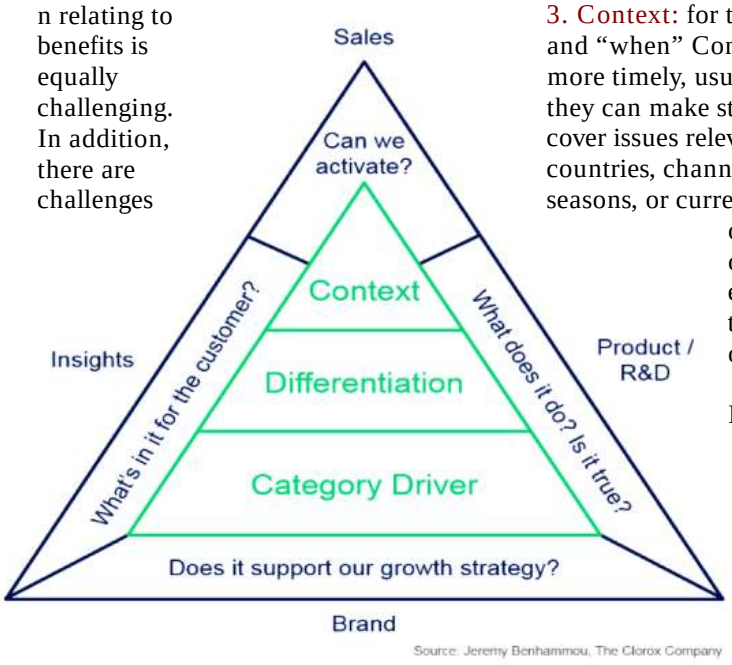
claims. What makes claims convincing depends mainly on active ingredient and structure of the claim, whereas framing and qualifier only have a minor role. Consumers use their existing knowledge when assessing the claims and familiarity seems to be crucial for finding the claim convincing.

Claims strategy

Claim architecture necessarily has two driving wheels: art of communication and delivery of intended information to customers. Skilful management of communication allows an enterprise to each of the customers from the target segment.

Good communication practice seeks to bridge the divide between scientific experts, policy makers, practitioners and consumers. Consumer perception and communication relating to benefits is equally challenging. In addition, there are challenges where simultaneous communication of risk and benefit is required. Nutrition communication holds tremendous potential to contribute to public health by stimulating informed healthier food choices and enhanced health-focused competition in the market place, provided that the health messages are trustworthy (i.e. scientifically substantiated) and correctly used and interpreted by the consumer.



Source: Jeremy Benhammou, The Clorox Company

An average person has a shorter attention span than a goldfish. (According to 2015 Microsoft study). Therefore, FBOs have about three seconds to influence a consumer to buy the product. A claim may be a simple statement, proof points or superlatives, but all claims can be sorted into 3 types of consumer benefits, each with their own business objective

1. Category driver: for category leaders and companies with a unique offering - The main goals of category driver product claims are to educate consumers, reassure them, or develop a category that consumers don't yet understand
2. Differentiation: Differentiation product claims showcase your brand's relevant and unique benefits
3. Context: for the "how", "where" and "when" Context claims are more timely, usually temporary, but they can make strong points. They cover issues relevant to specific countries, channels, retailers, seasons, or current events. They often take advantage of the unique environment where they are published or promoted

Phrasing a claim is an ongoing process of experimentation. A claim should be clear, concrete, and specific with product abilities, making the customer benefit immediately apparent. Consumers' attention span is tiny; therefore, a claim should be limited to 3-9 words without any logical jumps.

Four basic elements play a fundamental role in the communication process: - sender, message, channel, and the receiver. Communication management requires one to analyze consumer behaviour and characteristics in order to: define customer groups, conduct segmentation, explain their behaviour and identify the key factors that drive customers.

Furthermore, it is important to identify the barriers to effective communication, so as to develop common approaches for communicating coherent messages in relation to : characterization of food benefits, consequent communication implications, role of social media in communication of claims, consumers response to information and perception to develop relevant segmentation criteria, applicability of the concept of information seeking to the design of food risk/benefit communications, developing practical ways in which consumer sense making and deliberation can be taken into account in order to provide substantive benefits to stakeholders in developing communications. There is a need for more methodologically advanced research in consumer understanding of nutrition and health claims as a basis for truly assessing the real-life use of such information and its actual effect on consumer food choices. The need for more targeted information and greater communication efforts to make claims easier to understand and effective in supporting informed choices by consumers.

Take away points

- A truthful message is the basis of every claim
- Design is as important as execution
- Credibility of the message + messenger, both matter
- Only a package which ticks all the right boxes succeed
- Everyone looks at it from a perspective of their domain expertise

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THE EMERGENCE OF A STRONG PROTEIN INGREDIENT SECTOR

AUTHORS

Sivaganesh Vignesh Raja

F1rst (FirstMR Business Analytics Private Limited, Coimbatore, Tamilnadu)

Importance of Protein

Healthy body, Healthy mind is an old adage. Towards leading a healthier life, consuming a balanced diet is very essential. Consuming proteins, carbohydrates and fats, in a balanced quantum is essential for every human being, though the quantum required may vary as per one's life stage, lifecycle or nutritional requirement.

Let's take the case of proteins. Proteins are essential for muscle strength, maintenance and improved cell repair, enzyme secretion and transporting oxygen in body through haemoglobin. Another key role proteins perform are their ability to improve the immunity function (something we all wish, and pray for during these Covid19 times).

Current intake of Protein among Indians

Protein can typically be obtained from any of the plant sources (grain, pulses, nuts, seeds, vegetables), animal sources (dairy products, egg, poultry, sea food, meat), and other sources (algal, novel proteins etc).The National Institute of Nutrition in India recommends men to consume 60 g of protein, 55 g for women per day. Recommended Dietary Allowance (RDA), provided by the Indian Council of Medical Research (ICMR), has stated Indians 0.8 g to 1 g protein per kg body weight per day to meet nutritional requirements. A study conducted by IPSOS in 2018, found protein deficiency in 68% of Indians and more than 71% who have poor muscle health. Awareness of protein plays a critical role in fighting protein deficiency. Based on another study conducted by Right to Protein in 2020, among consumers (mothers) at large, there were a wide set of misconceptions such as proteins were difficult to digest, essential only for physically active people, leads to weight gain, protein products are costly, etc. Protein's ability to fight sickness, provide energy and control blood sugar was lesser/not known.

"Eat Right India" is a Government initiative to create awareness among Indians at large to eat healthier and nutrient-rich food. FSSAI promotes 'Protein Week' during the period 24th- 30th July every year to create awareness and spread knowledge on protein.

"Right to Protein", another public awareness campaign, specifically created to help Indians understand the protein intake and recognize better the various sources, and remove various misconceptions associated with protein. 27th Feb 2020 was observed as India's 1stProtein Day, with the 2021 edition themed as 'Powering with Plants'.

Danone, in collaboration with CII, launched in July 2020 the 4th edition of Protein Week, as part of its 'One Planet, One Health' vision campaign.

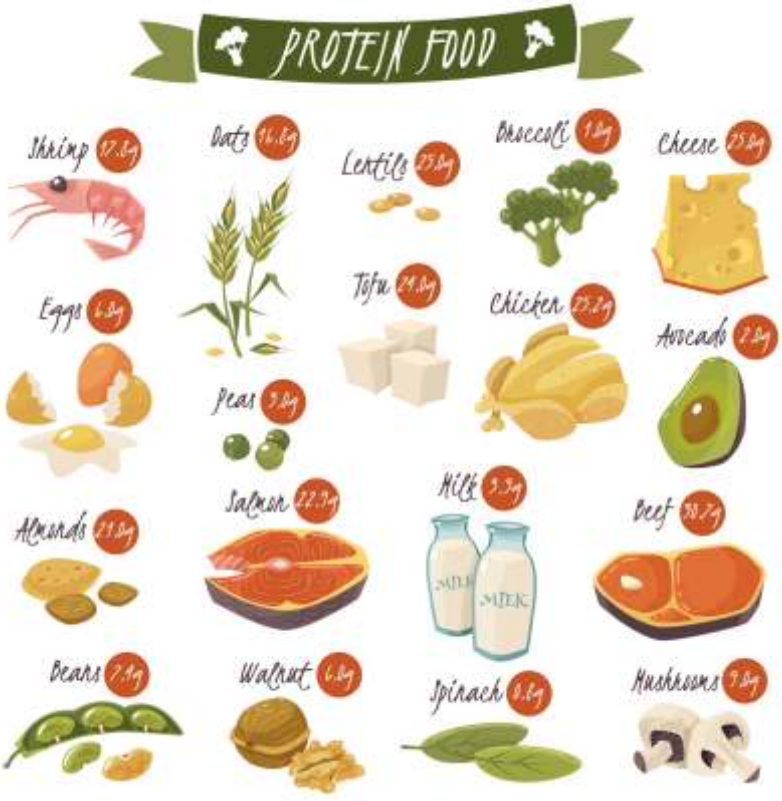
Where are the Proteins in your Food?

Indians have diverse food options, on the basis of the geographic location one is based out of. Take the case of a South Indian diet, which is more towards a rice-based diet, while someone in the North would consume more of a wheat-based nutrition, with East and West consuming more noodles and biscuits / chocolates as part of their food intake. A typical Indian diet generalising across locations would comprise of breakfast, beverage, lunch, snack, dessert and a dinner.

So from an Indian perspective - soy, wheat, dairy and rice proteins are more commonly consumed proteins, compared to other sources due mainly to availability reasons. Apart from providing their quintessential health and nutrition property, protein finds its application in food processing industry providing taste, texture and flavour too.

We all know that all proteins are based on a specific arrangement of selected amino acids. The order and ratio of these amino acids in a particular protein determine the physical properties of a protein and its functionality as a food ingredient. For example, the isoelectric point (IEP) of a protein will determine its use in neutral foods such as flavoured water, or in alkaline foods such as yogurts or in acidic foods like fruit-based drinks.

Thus, proteins modify their structure and functionality and show different properties depending on the pH, ionic strength, temperature, pressure or enzymatic mechanism of the food system during the processing stage. These modified or high-value speciality protein ingredients can be made using enzymatic reactions, hydrolysis, fermentation, heat treatment, acidification, dehydration, emulsification and ultrafiltration.



Shift in the Foodservice Paradigm

The foodservice industry in India (and the world-over)has suffered due to intense, staggered and periodic lockdowns due to Covid19. The pandemic has played on the psyche of the Indian consumer and curtailed many businesses across India.

Food Service Industry in India can be broadly classified into organized and unorganized. Organized are classified as chains (at least 3 outlets across country, domestic and international). These can further be classified as casual dining, fine, pub/bar/club, cafes and ice cream parlours, quick service restaurants (QSRs), standalone formats, etc.). An extension to this list includes corporate catering services / canteens, prisons, hospitals, schools, airlines, etc. which are generally called contract catering as compared to commercial catering. That said, it is important to note that the use of central kitchens has become significant. There is an increasing list of these food service companies which are using cloud kitchens and centralised kitchens, as there has been a considerable drop in consumer footfalls, with only delivery options available through e-commerce companies such as Swiggy, Zomato etc. This would mean, there is a lot of processing and pre-blending happening and the food service industry is moving to a new concept of semi-processed industry.

There has been an increased focus on safety and hygiene protocols, to bring them back to the table, or most importantly increase the customer confidence, even if it be a delivery. This is a big win for the consumers, as sanitary conditions through periodic safety audits etc, are here to stay. To provide a 'cooking at home' experience, some hospitality brands are providing 'ready-to-cook pre-mixed' ingredients.

The pandemic has opened RTE / RTC segments as more consumers are keen to experience the 'flex'/ 'flexitarian' experience, which can be made at home as thanks to the work from home, as more Indians spend time at home in their kitchens with their families. Protein ingredients can play a significant role in these ready-to-cook options.

Increase in vegan food preferences and consuming healthier food has been the order of the day. As consumers preferences shift from non-vegetarian food, 'vegan only' restaurants and brands promoting plant-based products have come to prominence. These meatless products are an international phenomenon and new generation protein ingredients including pea, rice, fava and other such protein ingredients are now used in different formulations in the meatless (and also dairy-free, egg-free and fish-free) products.

While this is a definitive trend and a major shift in the industry, it is important to note that these trends vary across different demographics of India (across geographic zones), as well as across the urban-rural divide, making it very complex to generalize at this stage.

The COVID19 Impact

The global pandemic has rattled the Indian food supply chain, like it has done globally, and has brought to focus the following consumer trends as the key market drivers:-

- Price
- Food Safety and Security
- Health & Wellness
- Immune-boosting

Indian consumers have taken to more RTE / RTC products to experiment and cook with family in the kitchen, as also to store up on food in event of lock-downs, shortage of vegetables, avoid frequent travel to the grocery stores. This, however could be an urban trend, as compared to the rural scenario.

Interestingly, products with standard protein ingredients (protein content below 50%) and those with value-added specialty extracted protein ingredients (protein content above 50%) have always targeted the urban customers; while those products with commodity ingredients such as milk solids, wheat flour, soy flour etc focused on the masses at large.

On the challenges faced by the supply side, lockdowns have meant a significant halt in the field sales teams of protein Ingredient suppliers getting little opportunity to meet up with their B2B customers, to explain the uniqueness / speciality of their product and demonstrate flavour and texture quotient effectively. The demand companies on the other hand, who are constantly looking to innovate, improvise and overcome technical challenges to introduce protein / novel ingredients in their products, are confined to virtual teleconferences to understand as per their imagination, the efficacy to the best of their abilities.

Market in Bloom

The alternative protein market in India is gaining traction, thanks to new-age food start-ups such as Good Dot (range of RTE, RTC products), Mister Veg (RTE / RTC), Vezlay (Frozen RTC), Veggie Champ, Vegolution (RTC segment), Goodmylk (vegan nut-based beverages), Befikar (protein fortified traditional Indian snacks), which have benefited greatly by the attention received by the health-conscious millennials, accelerated further by the growth of e-commerce businesses.
While it is quite encouraging to note the diverse plant protein sources being used, it is interesting to observe the growing and diverse use of protein as a technical ingredient too.

The market received more positive news as there are more products in the pipeline waiting to be launched mainstream by EVO foods (clean-egg replacers). Imagine Foods (range of plant-based faux meat products) is a venture between a Bollywood star couple and Archer Daniels Midland company.

On the protein ingredient side, one of the Indian food-tech start ups which shows potential is Proeon, whose products include amaranth protein, hemp seed protein, mung bean protein, fava bean and chickpea protein.

Another notable entrant to the Indian market is Beyond Meat. The popular US company which produces plant-based meat launched its Beyond Burger and Beyond Sausages products across select cities from April 2021.

In a related development, AAK Kamani & Vista Foods partner to tap into the growing plant based meat and dairy alternatives market in May 2021.

As we can see, these protein ingredients offer an immense opportunity as both technical and nutritional ingredients in the rapidly growing food and foodservice sectors in India. We at F1rst have taken up the challenge to categorise protein ingredients used in the Indian food and foodservice sectors as per the below classification. While this task has not been performed so far for the Indian market, it is necessary to analyse the market in such depth in order to understand the real dynamics of this high-potential sector:

- Commodity ingredients containing protein (milk solids, wheat flour, soy flour, other flours)

- Specialty extracted protein ingredients (protein ingredients with protein content below 50%) contributed through Defatted soy flour, Soy protein concentrate (SPC 35), Whey protein concentrate (WPC 35)

- Value added specialty extracted protein ingredients (protein ingredients with protein content of over 50%)

- Dairy proteins - Whey protein concentrate (WPC 80), Whey protein isolate (WPI), Whey protein hydrolysate (WPH), Milk protein concentrate (MPC), Milk protein isolate (MPI), Casein and caseinates

- Soy proteins – soy protein concentrate (SPC 80), soy protein isolate (SPI)

- Wheat proteins - Wheat gluten, wheat protein isolate

- Other plant proteins - Pea protein concentrate, pea protein isolate, rice protein, fava bean protein, lentil protein, others

- Animal proteins - Egg protein, gelatin, collagen

- Others - other proteins such as algal and other novel proteins

The end use (demand sectors) we are covering include bakery &cereals, dairy, processed meat, meat replacement, snacks, functional foods and beverages, infant nutrition, clinical nutrition, other foods, food service, retail flour, pet food, animal feed, traditional packaged foods.

The retail analysis of the products which we are researching will decode the simple protein fortified products available in the market on one end of the spectrum to the complex products infused by protein using alternates/novel proteins using innovative process/technology, without compromising on any of the sensory elements, most essential for consumers.

Conclusion:

- While Indians have long been protein deficient, there has been an increased effort undertaken by various stakeholders towards fulfilling the dietary needs and to enhance immunity levels

- While the foodservice industry has been impacted the most, the consumer stands to gain by way of improved food safety and hygiene measures and protocols

- There has been a marked shift in the foodservice sector with more companies moving towards cloud kitchens to fulfil delivery-only orders and the industry shifting towards a more semi-processing food sector

- There has been a considerable uptick in protein-based products, especially in the plant-based alternate protein market, driven by the need to reduce non-vegetarian food post-covid19, and also due to the increasing preference for vegan options

- Food producers can choose to decide which part of the Indian diet (breakfast, lunch, snack, beverage etc) they wish to capitalize on by understanding the local flavours and palate better, and innovating constantly

- Protein Ingredient suppliers while facing the challenge of reaching out to their potential B2C customers will find ways to collaborate with partners, as start-ups and investors are finding new ground in the market and unearth value.

This would essentially mean that the Indian protein ingredient Industry is well poised and set to break out and scale new heights in the years ahead, although it is currently treading cautiously due to the uncertain situation.

SUBSTANTIATION OF CLAIMS FOR VALUE ADDITION IN FOOD PRODUCTS

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Food manufacturers in order to improve or promote the sale of their products highlight their unique selling propositions and make claims of various sorts. Some of them could be nutrition or health claims.

The driving force of allowing nutrition and health claims for food industry is for added value, for society in improvement of public health and reduction of economic consequences of diet related diseases. However, health claims have become hot topics of interest ever since the concept of functional food was launched in the 1990s. The starting point of discussion on health claims began in the year 1984 in United States when a reputed company made a claim on cereals that cereals rich in fibre would prevent cancer. Similarly, claims on fermented milk products and oat bran were point of discussion in the beginning. While functional foods with health claims provide opportunity for fostering innovation in the food industry and improving public health, there are also potential risks associated with their use, for example the lack of beneficial health effects or even health concerns which may arise from the regular consumption of these foods

(https://www.sciencedirect.com/science/article/pii/S0924224417302315)

In order to protect consumer, promote fair trade and encourage innovation in food industry, several approaches to the use of health claims on foods have been made around the world, and the common theme is that any health claim will require scientific validation and substantiation, i.e. any health claim needs to be authenticated and offer the evidence that sustains the contention. Substantiation is the process of deciding whether the body of scientific evidence supports a claimed relationship between a food, property of a food (including a nutrient or other bioactive substance or other defined property of the food) and a specific health effect. While each country makes their own mechanism to regulate the health claim, the Codex Alimentarius commission, an international body working under the aegis of FAO/WHO which provides guidance to its member countries on food safety and standards, has developed a guidance document on nutrition and health claims. This document provides essential components of scientific substantiation of nutrition & health claims. As per these guidelines there are five steps and they are

1. Identification of the proposed relationship between the food or food constituent and the health effect
2. Identification appropriate valid measurements for the food or food constituent and for the health effect
3. Identification and categorization all the relevant scientific data
4. Assessment of the quality and interpretation each relevant scientific study
5. Finally evaluation of the totality of the available relevant scientific data, weighing the evidence across studies and determining if, and under what circumstances, a claimed effect is observed.

Type of studies required for substantiation:

a) The scientific data required to address the five steps suggested for substantiation of health claim should primarily be based on evidence provided by well-designed human intervention studies. a) Human observational studies are not generally sufficient per se to substantiate a health claim but where relevant they may contribute to the totality of evidence. Animal model studies, ex vivo or in vitro data may be provided as supporting knowledge base for the relationship between the food or food constituent and the health effect but cannot be considered as sufficient per se to substantiate any type of health claim.

b) The totality of the evidence, including unpublished data where appropriate, should be identified and reviewed, including: evidence to support the claimed effect; evidence that contradicts the claimed effect; and evidence that is ambiguous or unclear.

c) (c) Evidence based on human studies should demonstrate a consistent association between the food or food constituent and the health effect, with little or no evidence to the contrary. Although a high quality of scientific evidence should always be maintained, substantiation may take into account specific situations and alternate processes, such as some health claims, such as those involving a relationship between a food category and a health effect, may be substantiated based on observational evidence such as epidemiological studies. Such studies should provide a consistent body of evidence from a number of well-designed studies. In cases where the claimed health effect cannot be measured directly, relevant validated biomarkers may be used. For example, plasma cholesterol concentrations for cardiovascular disease risk.

Methodological quality of the studies: Appropriate study design and statistical analysis for each of the studies considered. In case of human intervention studies, they should notably include an appropriate control group, characterize the study groups background diet and other relevant aspects of lifestyle, be of an adequate duration, take account of the level of consumption of the food or food constituent that can be reasonably achieved in a balanced diet, and assess the influence of the food matrix and total dietary context on the health effect.

Totality of the available relevant scientific data: After weighing the evidence, the systematic review should demonstrate the extent to which:

i. the claimed effect of the food or food constituent is beneficial for human health;

ii. a cause and effect relationship is established between consumption of the food or food constituent and the claimed effect in humans such as the strength, consistency, specificity, dose-response ,where appropriate, and biological plausibility of the relationship;

iii. the quantity of the food or food constituent and pattern of consumption required to obtain the claimed effect could reasonably be achieved as part of a balanced diet as relevant for the target population for which the claim is intended;

iv. the specific study group(s) in which the evidence was obtained is representative of the target population for which the claim is intended.

Based on this evaluation and the substantiation criteria, food and health relation is substantiated. These are important points for consideration for substantiation of health claim as envisaged by Codex (http://www.fao.org/ag/humannutrition/32443-04352e8311b857c57caf5ffc4c5c4a4cd.pdf).

All the member countries of Codex essentially use this guidance document as reference and make their own national policy to regulate the health claims on the food products.

Examples of mechanisms evolved for scientific substantiation of health claims:

The strength of scientific evidence needed to substantiate such health claims is typically described in European Union as "generally accepted scientific evidence of beneficial physiological effect in humans" , "significant scientific agreement" in United States and Canada, while it is an "established food-health relationship based on the totality and weight of evidence" in Australia and New Zealand (Raats et al., 2016).

Significant scientific agreement (SSA) : It is an agreement among the qualified experts that the health claim is supported by the evidence, which is based on the totality of the publicly available scientific evidence (including evidence from well-designed studies conducted in a manner that is consistent with generally

In order to meet requirement of significant scientific agreement, the US FDA has developed a evidence based review system for scientific evaluation of Health claim.

Evidence-based review system: It is a systematic science-based evaluation of the strength of the evidence to support a statement. In the case of health claims, it evaluates the strength of the scientific evidence to support a proposed claim about a substance/disease relationship.

The evaluation process involves a series of steps to assess scientific studies and other data, eliminate those from which no conclusions about the substance/disease relationship can be drawn, rate the remaining studies for methodological quality and evaluate the strength of the totality of scientific evidence by considering study types, methodological quality, quantity of evidence for and against the claim (taking into account the numbers of various types of studies and study sample sizes), relevance to the U.S. population or target subgroup, replication of study results supporting the proposed claim, and overall consistency of the evidence.

After assessing the totality of the scientific evidence, FDA determines whether there is SSA to support an authorized health claim, or credible evidence to support a qualified health claim.

USFDA Authorized health claims in food labelling are claims that have been reviewed by FDA and are allowed on food products or dietary supplements to show that a food or food component may reduce the risk of a disease or a health-related condition claim, while qualified health claims are supported by some scientific evidence, but do not meet the significant scientific agreement standard.

To ensure that they are not false or misleading to consumers, qualified health claims must be accompanied by a disclaimer or other qualifying language to accurately communicate the level of scientific evidence supporting the claim (https://www.fda.gov/regulatory-information/search-fda-guidance-documents/guidance-industry-evidence-based-review-system-scientific-evaluation-)

Generally accepted scientific evidence of beneficial physiological effect in humans: In order to meet the requirement of generally accepted evidence for the food- beneficial physiological effect in humans, European Union has developed a review method called 'Process for the Assessment of Scientific Support for Claims on Foods'' (PASSCLAIM) PASSCLAIM defined a number of generally applicable criteria for the scientific support of claims. These criteria emphasized the need for direct evidence of benefits to humans, recognized the usefulness of markers of intermediate effects, and emphasized that effects should be both statistically and biologically meaningful.

These criteria were considered to be a scientifically robust tool for evaluating the quality of the data submitted in support of health claims on foods. PASSCLAIM is useful in assisting applicants for a health claim to prepare their supporting dossiers as well as in aiding agencies responsible for evaluating the scientific evidence for the claim. (https://academic.oup.com/jn/article/138/6/1210S/4670293)

Established food-health relationship based on the totality and weight of evidence: In Australia-New Zealand, health claims rely on the food-health relationship. An established food-health relationship refers to a food health relationship for which evidence has been examined using the substantiation process and a reasonable conclusion drawn from the evidence that the relationship is causal. Establishing a food-health relationship using a process of systematic review is guided by the following principles

Systematic Approach: a methodical, consistent approach to examining the relevant studies Transparency: literature search strategies, selection and evaluation are fully disclosed and can be replicated.

Comprehensiveness: all relevant evidence pertaining to the food-health relationship is captured, including evidence in favour and not in favour of the food-health relationship.

Evidence in humans: a food-health relationship cannot be established from animal and in vitro studies alone. Studies in humans are essential.

Causality: demonstration of causality is based on the quality and quantity of direct evidence, which investigates the food-health relationship. Indirect or mechanistic evidence is not, sufficient by itself. (https://www.foodstandards.gov.au/publications/Documents/Information%20on%20establishing%20food%20health%20relationships.pdf)

The guidance document also provides decision tree for systemic review approach for scientific substantiation of health claim, where one can decide by answering questions in Yes/No format to identify whether there exists and food-health relation for the claim they are making.

Formulate FRH

Formulate Literature Search Strategy

Identify & categorise studies (Y/N)

Are there any human studies (Y/N)

A well designed experimental, cohort, case control studies (Y/N)

Assess and interpret evidence Are the studies likely to be of sufficient quality to allow a subsequent assessment of the totality of evidence? (Y/N)

Assess totality of evidence Consistent association? Causal relationship independent of other factors? (Y/N)

Food-health relationship likely to be established under identified circumstances (Y/N)

Consider amount of food/property of food required to achieve the health effect in context of ANZ populations

India: The concept used in India for scientific substantiation of health claims is essentially derived from Codex guidelines. Health claims are regulated by Food Safety and Standards Authority of India (FSSAI), and it requires an application form from the food business operator for the purpose of approval any health claim. The application form should provide the following information to assess the scientific evidence to validate the claim.

i. Name of ingredient, nutrient or substance on the basis of which the claim is to be made;

ii. Validated Method of analysis of ingredient or substance for which the claim is to be made;

iii. Scientific information or materials substantiating the claim;

iv. How is the claim clear and meaningful and help consumers to comprehend the information provided;

v. Well-designed human intervention studies in case of health claims conducted by or under guidance of established research institutions; and
vi. Any other useful information
https://www.fssai.gov.in/upload/uploadfiles/files/Gazette_Notification_Advertising_Claims_27_11_2018.pdf

Conclusion: Essentially scientific substantiation of health claim depends on the totality of available scientific evidence and it has potential benefits for several stakeholders. First, the individual consumer profits from guidance on which foods and food ingredients possess the potential to reduce risk of degenerative disease, improve longevity, and reduce dependence on pharmaceuticals. Second, health care service providers enjoy reduced operating costs resulting from a healthier population with reduced requirements for drugs. Third, corporations profit from improved market share, subsequent to increased appeal and penetration of products bearing health claims within the food marketplace. Fourth, food producers profit from higher commodity prices obtained from food constituents with added health value.

INGREDIENTS OF A SUCCESSFUL FOOD FORTIFICATION PROGRAM

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Covid-19 has worsened nutrition issues across India, subduing incomes and access to food. Micronutrient deficiency is a widespread and persistent problem in India, and to ensure health and resilience among at-risk populations, food fortification is a powerful way of fighting it.

In March 2020, Covid-19 became a vital difficulty for India, leading to a strict nationwide lockdown, worsening the poverty situation in the country. Hence when the needy could no longer satisfy their own needs, it was time for some structured efforts to develop nutrition overall by building political buy-in, contribution by prominent private sector producers, FSSAI, and other authoritative administrations, and distribution through social safety net programs i.e. through the Food Fortification Programs. Hence, for the sake of India's most vulnerable, we need Food Fortification Programs to accelerate this momentum further with multi-stakeholder action at scale. Let us see how.

1. Defining and setting program goals

Knowledge is the oxygen of the modern age. The first element of change is awareness. It is difficult to change something unless we know it exists. To be able to design a successful fortification program that delivers its nutritional objectives, it is essential to gather some information and data first on nutritional status in various populations to understand the scale and severity of specific nutrient deficiencies and dietary patterns.

This information sets the tone of the entire Fortification Program and helps to prioritize the targets, needs to achieve them, and the constraints that can hinder the execution of this program like safety, cost, technology, and the impact of these technologies used. With regards to the planning stages of fortification programs, this factor sets an outline.

2. Developing capacity within the government, coordinating with Centre-State Infrastructure

Peculiar fortification of some commercial foods through successful programs is ensured when reliable infrastructural support exists with the widespread distribution system and comprehensive partnership with the scientific community, industry, consumers, and other relevant interested stakeholders in partnership with government through its legislative process. Government Administrative support and promotion of Fortification Programs in developing countries, as accelerated by the advertisement of such programs is very important to fight malnutrition at the highest levels.

Since a Food fortification program is multi-dimensional, a well-regulated toolkit and legal mandates, rules, and regulations would benefit Indian states, allowing them to achieve best-in-class acquisition and distribution arrangements and manage their commerce and quality check. Simultaneously governmental and non-governmental bodies such as the NITI Aayog could provoke healthy

competition amongst states, as seen in the case of the WASH, Health, and Education sectors to trace progress, deviation, and progression.

3. Encouraging technological innovation and quality assurance:

Any given industry has a minimum set of technical requirements. However, these requirements often come with a heavy cost that is not affordable for small producers. Hence, technical innovation can be game changing to improve traceability across the Food Fortification Supply Chain and develop village-level mixers, electric modifiers with built-in sensors for pulses and legume millers, and small-scale salt iodization.
This can act as a facilitating factor in newly rising markets in less industrialized countries, especially for the private-sector food industry, and enable them to profit from commercially sold foods at several locations under varying cooking conditions in the country where fortification occurs.

4. Socio-economic and Political facilitating factors

Improved knowledge and recognition of the health, developmental, and commercial outcomes of micronutrient malnutrition are vital, especially for the sustaina-bility of food fortification programs. Active participation from different sectors of society creates successful results.

For example, in India, non-governmental organizations in many states regulate

salt for iodization at the retail and household levels.
Self-Help Groups in rural areas create awareness and cook meals using fortified staples. Environmentalists and others promote the '+F' logo to create consumer awareness about fortified Staples. For urban sections, the government mandates the use of fortified staples through food processors and food & beverage chains, encourages workplaces to serve fortified foods in their canteens, and influences large retailers to promote them.

5. Planning and designing a fortification program:

For in-depth program planning, preparation, execution, and further monitoring and evaluation the program needs to get the nutrition experts on board to measure the results and impacts of its Food Fortification programs. It is very important to look at these programs with a broader perspective and take into consideration the presence of the hindrances like the prevailing infections, parasites that can affect the intake of fortified food

The Food Fortification programs can be made even more cost-effective with supplementation to assure that specific population groups (e.g. pregnant women and young children who are often the most vulnerable groups) are guarded against micronutrient deficiencies than fortification alone. Starting with collecting food intake data, assisted by ancillary information such as biochemical and anthropometric data on the nutritional status of the program can help authorities to make an informed judgment about the types and amounts of specific nutrients, and suitable food vehicles for the food fortification program. Here is the list of Food Fortification Programs implemented in India https://extranet.who.int/nutrition/gina/en/programmes/1457

WEBINAR REPORT
LICENSING & REGISTRATION FROM FLRS (Food Licensing & Registration System) TO FoSCoS (Food Safety Compliance System)
A CRITICAL OVERVIEW

AUTHOR
Ms. Girija Damle,
Dietitian, PFNDAI

Protein Foods & Nutrition Development Association of India (PFNDAI) recently organized a webinar on "Licensing and Registration from FLRS to FoSCos: a critical overview", where the main objective was to help our audience understand recent developments and challenges in food licensing registration, and food safety in India. The webinar was held on 16th April 2021.

The speakers for the webinar were Dr. Shatadru Sengupta (Sr Director-Legal, Hardcastle Restaurants Pvt Ltd), Dr. Joseph Lewis (Food Regulatory Consultant), Dr. Prabodh Halde (Head Regulatory R&D, Marico), Mr. Shashank Churi (Asst. Manager Quality, Hindustan Unilever Ltd), along with the panellists, Ms. Rini Sanyal (Director-Global Regulatory & Product Compliance, India Herbalife Nutrition), Ms. Meenu Yadav (Technical Regulatory Affairs Manager, Marico), Dr. Jasvir Singh (Regulatory, Scientific & Government Affairs Lead- South Asia, IFF), and Mr. Bhupinder Singh (MD & CEO, Vista Processed Foods). The webinar was attended by approximately 250 audiences. The attendees included professionals working in food industries mostly from regulatory and compliance domain.

Dr. Joseph Lewis welcomed everyone and gave a brief introduction about the program. He said that the rationale behind regulations is as important as compliance to the regulation, and such webinars help in exchange ideas on these topics. Ms. Swechha Soni (Manager- Food & Nutrition at PFNDAI) introduced the experts of the session.

Dr. Joseph Lewis in his presentation 'Introduction: FLRS to FoSCoS' explained the three main aspects of regulation. These are the licensing (for the process of production), standards (for the product that is produced in terms of content, quality, etc), and the label and claims on the product that are presented. He said that the purpose of licensing is to ensure that only safe food reaches the consumers. He threw some light on the provisions for compliance and enforcement of licensing laws that are provided by FSSAI with the help of the enforcement pyramid and its various components. Food safety, he said is the responsibility of both the food business operator and the governing bodies. Dr. Lewis concluded by talking about global alignment on responsibility and control of food safety.

The second speaker, Dr. Shatadru Sengupta gave a talk on- 'Licensing: some principles'. He explained the importance of licensing with some daily life examples and said that it is important to keep track of the products and food safety, public safety, and enforce the regulations. On the other hand, the purpose of registration is to inform the governing bodies and has a lower degree of control. Thus not only registration but also licensing is necessary. He explained in detail, the concept of capability vs conformance, and the various clauses in the FSSAI regulations that are necessary to be fulfilled by an FBO to carry out business according to the FSS act 2006. He concluded by talking about the application for FBO registration and explaining the nitty-gritty of the same.

Dr. Prabodh Halde talked on the topic 'FLRS to FoSCoS' highlighting the transition from the old system to the new one. He said that the purpose of licensing is to bring the manufacturers in the net to monitor them in the pursuit of food and public safety.He shared the preamble of the FSS Act, 2006 to explain the origin of the present-day

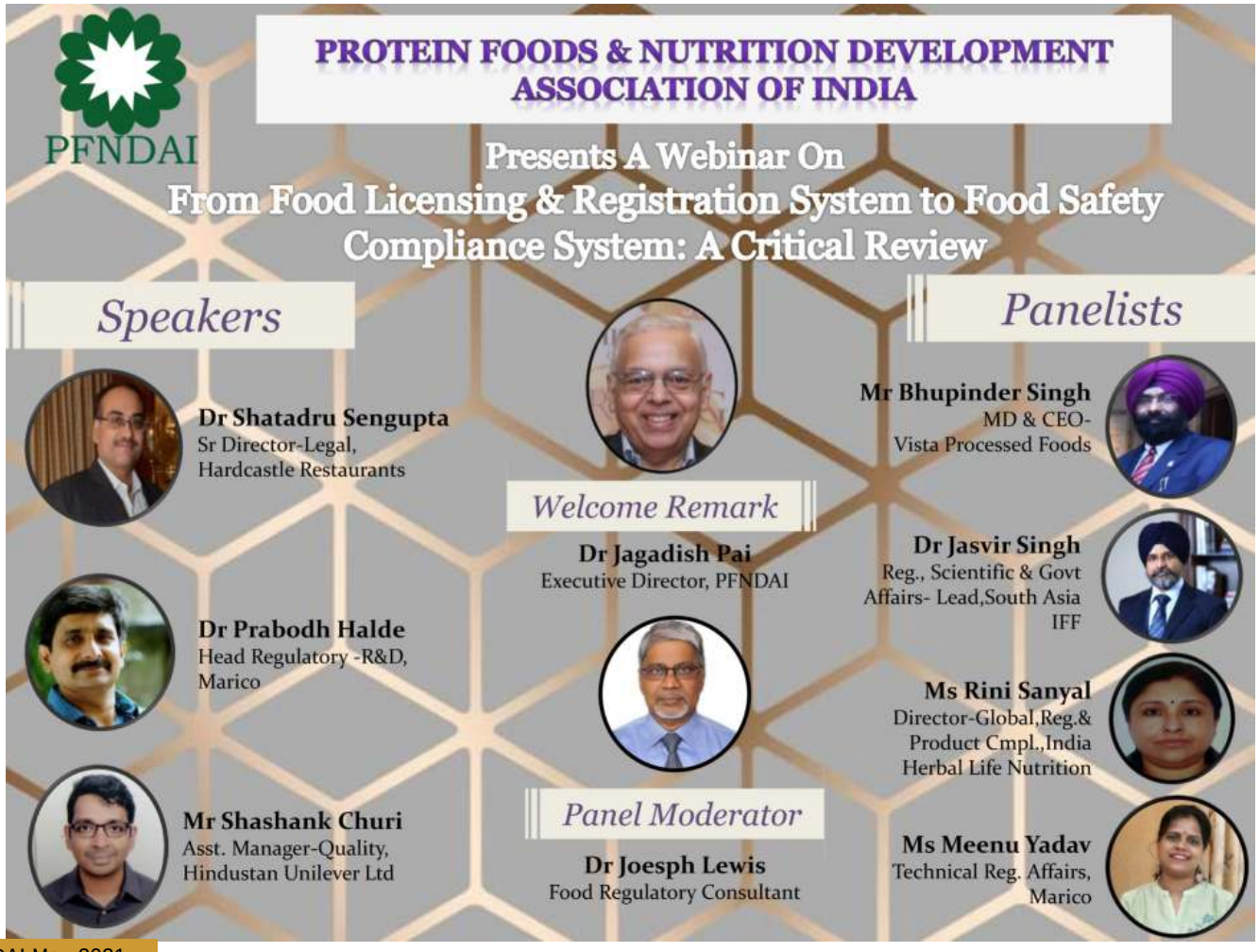
He explained the sections of the FSS Act in detail and threw some light on the positives and negatives of the same. Dr. Halde described the 3 levels of licensing and registration-registration authority, state licensing authority, and central licensing authority. He also shared the various turnover slab or types of food businesses that fall under each category. He continued to decode the FLRS procedure for licensing with a help of a comprehensive flow chart. He then continued to explain FoSCoS, its objectives, its advantages over the older system, and the new features of the same. He highlighted the improved operational capabilities, enhanced technological platform, and user-centric approach of FoSCoS. He concluded by explaining the application procedure followed by the challenges of FoSCoS.

Mr. Shashank Churi, in his talk on 'Walk through the online process', gave an insightful step-by-step guide to the online application process. He began with details on signing up and creating an account, navigating through the dashboard, filing the application form, applying for multiple licenses, choosing the correct FBO details, modification of application, documents required, and payment. He also explained the steps for renewing a license and the various resources available on the FoSCoS website. Along with this, he also provided tips to avoid errors while using the online portal and to ensure a smooth application process.

The audience had some questions that were addressed in brief details by all the speakers after their respective talks.

The presentations by the speakers were followed by a panel discussion conducted by Dr. Joseph Lewis, on queries related to food licensing and registration in India. The panellists were Ms. Rini Sanyal, Ms. Meenu Yadav, Dr. Jasvir Singh, and Mr. Bhupinder Singh. The enlightening panel answered various questions like the feasibility of integrating data from various food licensing and registration systems and ease of doing business, challenges that are posed by stringent food business categories, the introduction of a new product in the food market and its nomenclature, standardisation of proprietary food products, GMP and nutraceutical production guidelines, improvement notices and its repercussions, etc. The panel discussion provided a platform for the exchange of ideas, clarification of doubts, and productive brainstorming about the newer programs and guidelines by FSSAI. The experts also answered case-specific questions regarding the food category selection and submission of regulatory forms.

The webinar ended with a vote of thanks by Ms. Girija Damle.

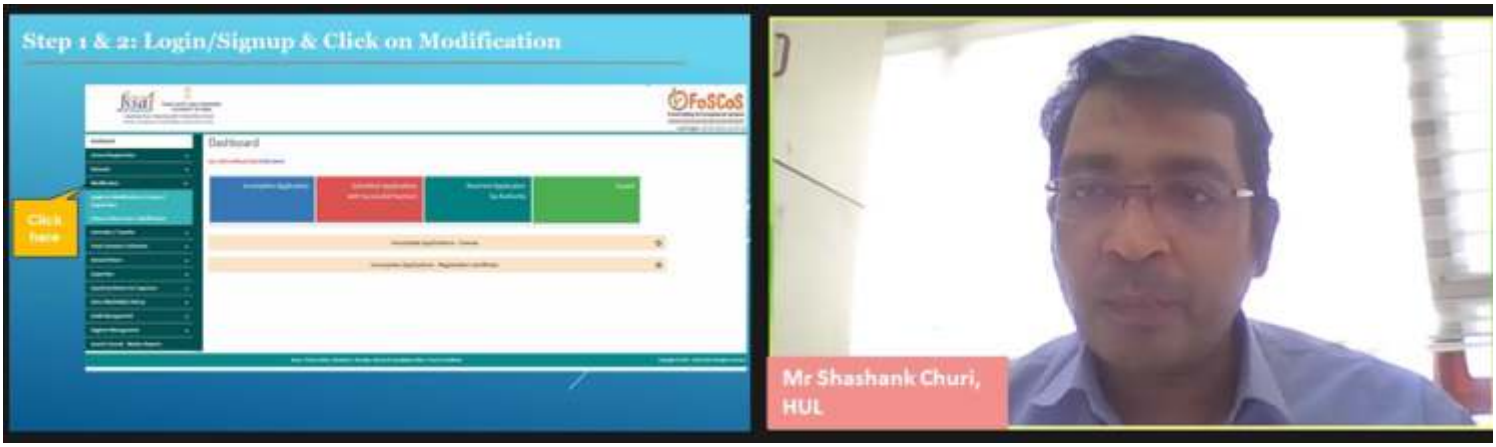



Dr Joseph Lewis
Dr Shatadru Sengupta
Ms Meenu Yadav
Ms Rini Sanyal
Mr Bhupinder Singh

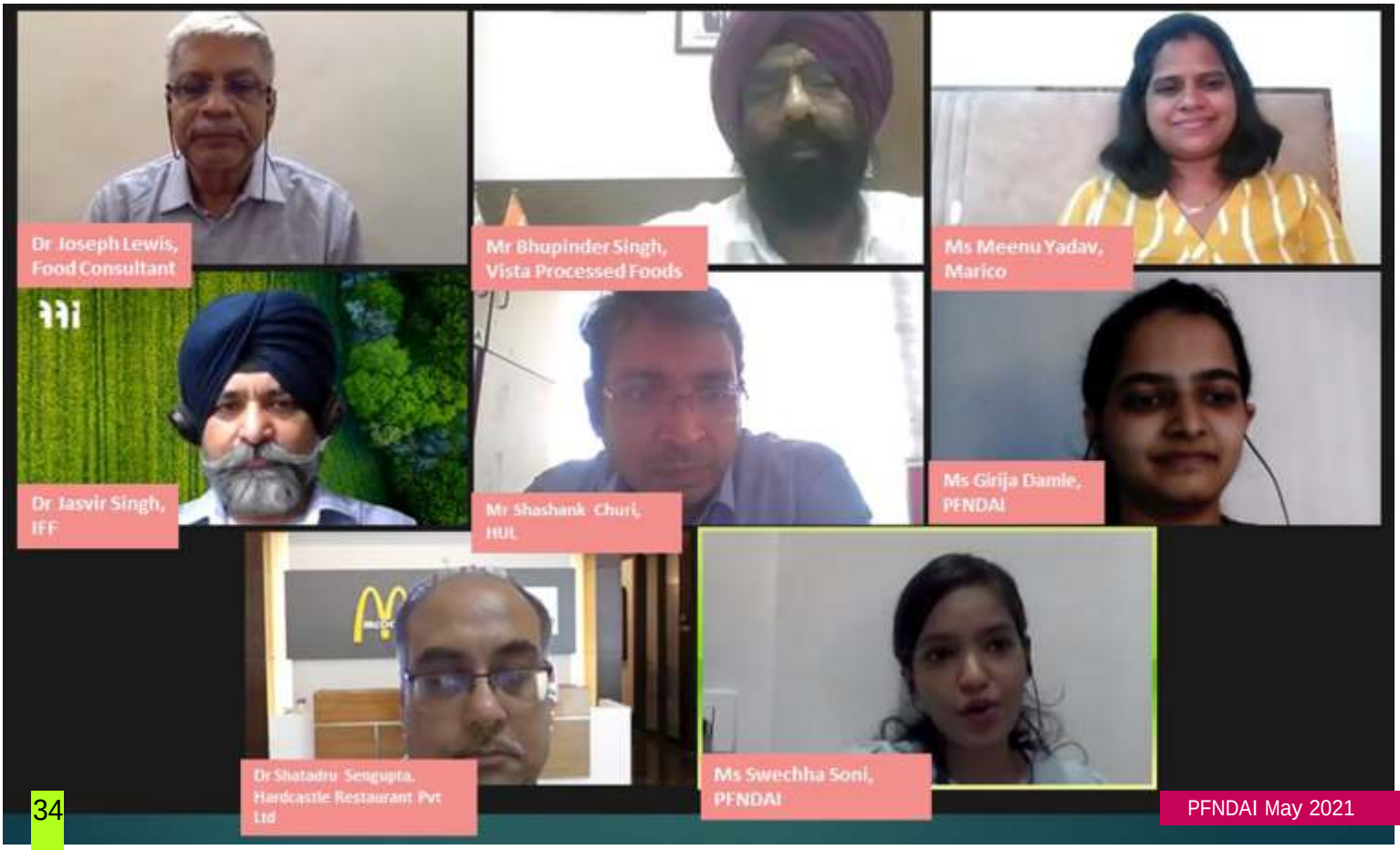

A simple view of regulations
PROCESS
(LICENSING)
PRODUCT
(STANDARDS)
PRESENTATION
(LABEL, CLAIMS)
Principle
Purpose
Practice
Dr Joseph Lewis,
Food Consultant
Dr Shatadru Sengupta,
Hardcastle Restaurant Pvt Ltd

Examples of licensing

- Industrial license under the Industries (Development & Regulation) Act, 1951
- Driving license under the Motor Vehicles Act, 1988
- Flying license under the Aircraft Act, 1934
- License under the Food Safety and Standards Act, 2006


Step 1 & 2: Login/Signup & Click on Modification
Click here
Mr Shashank Churi, HUL


Dr Jasvir Singh, IFF
Mr Bhupinder Singh, Vista Processed Foods
Ms Meenu Yadav, Marico
Dr Joseph Lewis, Food Consultant
Ms Rini Sanyal, Herbalife Nutrition
Mr Shashank Churi, HUL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Dr Jasvir Singh, IFF
Mr Shashank Churi, HUL
Ms Girija Damle, PFNDAI
Dr Shatadru Sengupta, Hardcastle Restaurant Pvt Ltd
Ms Swechha Soni, PFNDAI

REPORT OF PFNDAI Webinar ON EXPLORING BENEFITS OF DAIRY MATRIX, WITH SPECIAL EMPHASIS ON MILK PROTEIN UTILIZATION, TO MAKE HEALTHIER FOOD PRODUCTS

AUTHOR
Ms Anuja Padte,
Food Scientist PFNDAI

Protein Foods and Nutrition Development Association of India (PFNDAI) organized a webinar on "Exploring Benefits of Dairy Matrix, with Special Emphasis on Milk Protein Utilization, to make Healthier Food products" sponsored by Hexagon Nutrition and Agropur on May 7, 2021.

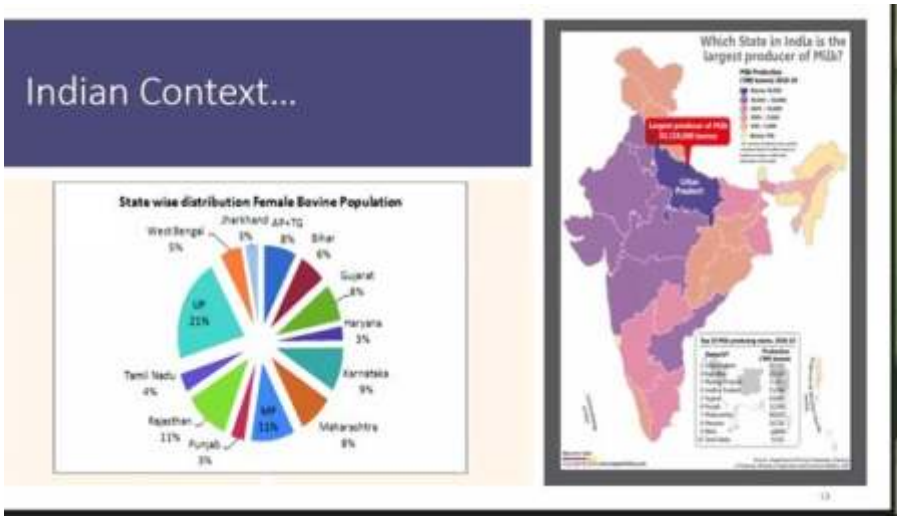
Dr J S Pai, Executive Director, PFNDAI welcomed all speakers, chairpersons and panellists and thanked the delegates for attending the session in such large numbers. He also thanked Hexagon Nutrition and Agropur for providing the necessary support for the webinar.

Ms. Swechha Soni, Manager Food & Nutrition, PFNDAI welcomed the participants and introduced the speakers: Mr. Gokulkrishnan S S , Senior Manager - QA and R & D , Amul Dairy, Mr. Rohit Mittal, Category Manufacturing Services Manager at Nestle India Ltd and Ms. Joanie Zhang, Technical Support Scientist at Agropur US Operation and panel members Mr. Manish Singh, Chief Operating Officer for Fonterra Future Dairy, Dr Madhavi Marathe, Senior Manager, Healthcare Nutrition Science at Danone, Dr Nandan Joshi, Head- Medical Affairs Nutrition, India & Emerging Markets at Dr Reddy's Laboratories and Ms. Mani Misra Scientific Regulatory affairs and Nutrition, Corporate Nutritionist Mother Dairy.

The first speaker of the afternoon was *Mr. Gokulkrishnan S. S.* He presented the topic *"Strategies for Sustainable Dairy Industry in India"* in which he presented a study on how many of the advanced countries like Europe etc. are lagging behind Dairy Business and many of the farmers are closing their farms as they are not able to sustain the dues. He mentioned the Indian context where Uttar Pradesh is the largest milk producing state and mentioned about the federal production and distribution of milk.

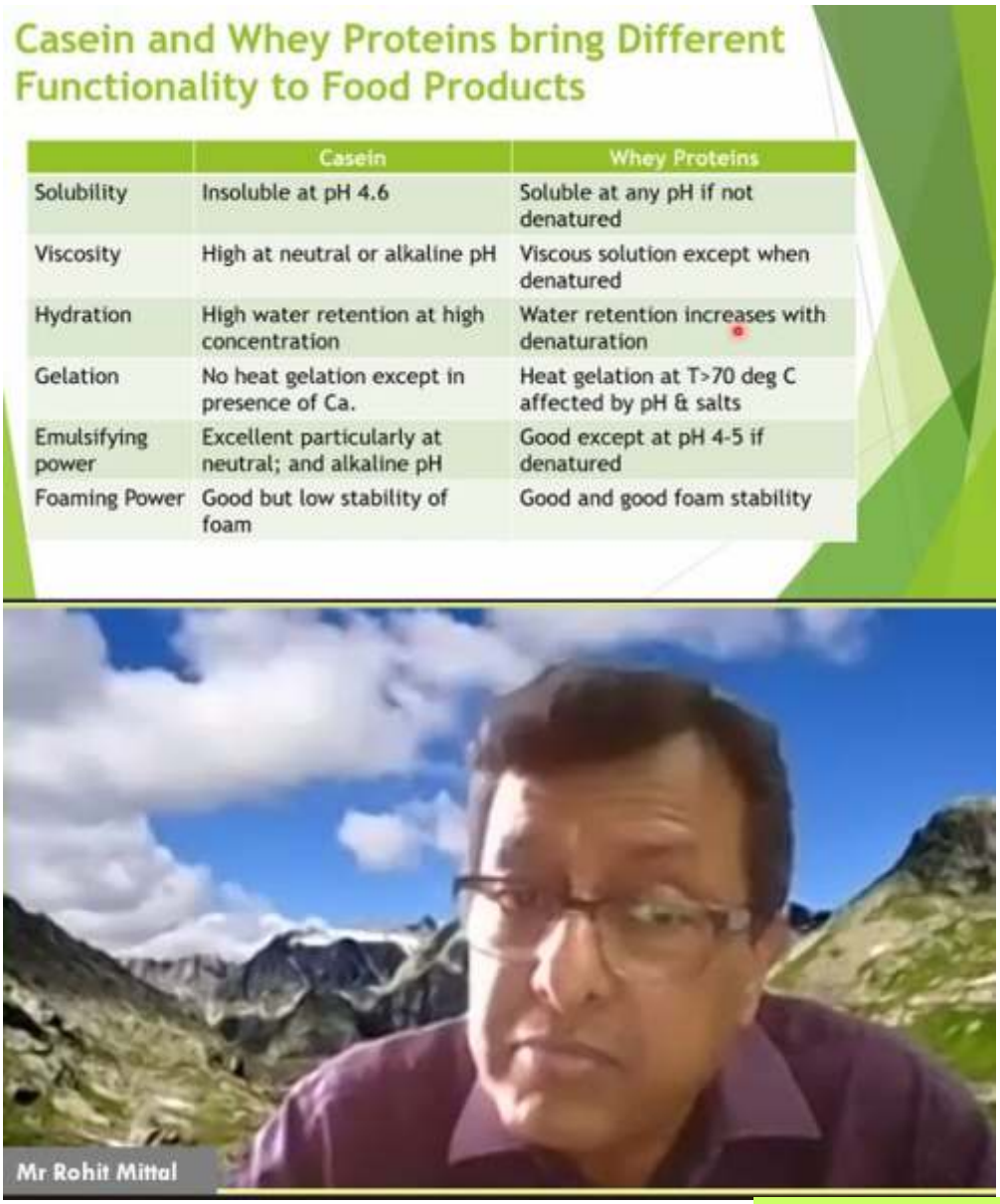
Mr. Gokul also mentioned the short scenario of India Milk Demand and a study of per capita national income across India in the financial years 2015 and 2017, with estimates for 2021. Further, he talked about the Covid Impact about the dairy industry and how it is growing and helping the poor farmers in this pandemic.

He ended his presentation with a briefing on various aspects and strategy of Dairy Industry, which included points like Milk Producer, pricing of milk, availability of land and labour, availability of feed, availability of veterinary services, availability of government policies, availability of advanced technologies, wealth from waste, and affinity to business.



Mr. Rohit Mittal presented on *Application of Milk Proteins in Food Product /Nutritional Supplement Powders*. He informed the audience about protein, its limits, quantity and quality and mentioned that proteins are the key components of human body which are essential for cell and tissue growth and mentioned the 20 amino acids as building blocks, essential and non-essential and in terms of protein, the maximum limit for protein in adults should be 0.80 to 0.83 g per kg body weight and the elements that need to be considered are protein sources, protein quality and protein quantity.

He explained that protein quality has been defined by nutritionists as the ability of a dietary protein to meet the requirement for regular metabolism and maintenance or growth of body tissues. He further explained the milk tree and the process of milk to various end products. He also informed about the term Milk Cracking, which describes the process of conversion or fragmentation of milk into different factors and explained a flow chart depicting the 14 different types of components of skimmed milk. He also explained the membrane process used for fractionation of milk. Further, he informed about Whey Demineralization and Manufacturing Process and discussed how casein and Whey Proteins bring different functionalities in Food Products and ended his presentation with a briefing on applications of Milk Derivatives in different products.



	Casein	Whey Proteins
Solubility	Insoluble at pH 4.6	Soluble at any pH if not denatured
Viscosity	High at neutral or alkaline pH	Viscous solution except when denatured
Hydration	High water retention at high concentration	Water retention increases with denaturation
Gelation	No heat gelation except in presence of Ca.	Heat gelation at T>70 deg C affected by pH & salts
Emulsifying power	Excellent particularly at neutral; and alkaline pH	Good except at pH 4-5 if denatured
Foaming Power	Good but low stability of foam	Good and good foam stability

The last speaker of the session was *Ms. Joanie Zhang* who gave a presentation on *Health Benefits from Whey Proteins* where she gave an overview of what whey protein is and the types of whey protein ingredients and gave detailed information on the protein content of whey protein ingredients developed by Agropur - WPI (Whey Protein Isolate) protein content 90% dry base, WPC (Whey Protein Concentrate) protein content 35-85% & WPH (Whey Protein Hydrolysate) enzyme hydrolyzed proteins. Ms. Zhang went on to talk about why whey protein is of high nutritional value, mentioning that it contains a high source of protein, is rich in branched chain amino acids, is digested and absorbed quickly, and is high in cysteine, which can improve oxidation. She further gave an overview of the amino acid profile in whey proteins and informed the audience about the nutritional value of whey proteins and talked about various interesting aspects including - high quality protein, mainstream nutrition, sports nutrition, healthy ageing , improving immunity. She also highlighted how whey protein can help in dietary management of type 2 diabetes and how it can also be used as a complete diet for the COVID -19 patients. She ended her presentation by addressing the high nutritional value of Whey Protein, products that can be developed using whey protein, and how important Whey Protein is for all stages of life.

Following the presentations by the speakers, a panel discussion was held which was chaired by Dr J S Pai and Ms Swechha Soni. The panellists for the session were Mr. Manish Singh, Dr Madhavi Marathe, Dr Nandan Joshi and Ms. Mani Misra. The moderator asked some questions on various aspects such as the importance and role of milk protein in Indian diet, why are milk protein concentrates or isolates used in high protein powders for athletes, the difference between whey and casein - both in terms of nutritional value and properties, consumption of whey protein in lactose intolerance and the difference between whey protein concentrate, whey protein isolate and hydrolysed whey protein.

The panel discussion was followed by a short question and answer session where some of the questions asked by the audience were answered.

The webinar ended with a thank you speech by Ms Megha Mandke from Hexagon Nutrition to all Honourable Speakers, sponsors and the delegates.


Dr Jagadish Pai
Dr Nandan Joshi
DREAMERY
130 YEARS OF TRUSTED DAIRY
DESIGNED IN NEW ZEALAND
Mr Manish Singh


Dr Jagadish Pai
Ms Mani Misra
Mr Gokulkrishnan
Ms Joanie Zhang
Dr Madhavi Marathe
Ms Megha Mandke


Ms Swechha Soni
Dr Jagadish Pai
Ms Mani Misra
Mr Gokulkrishnan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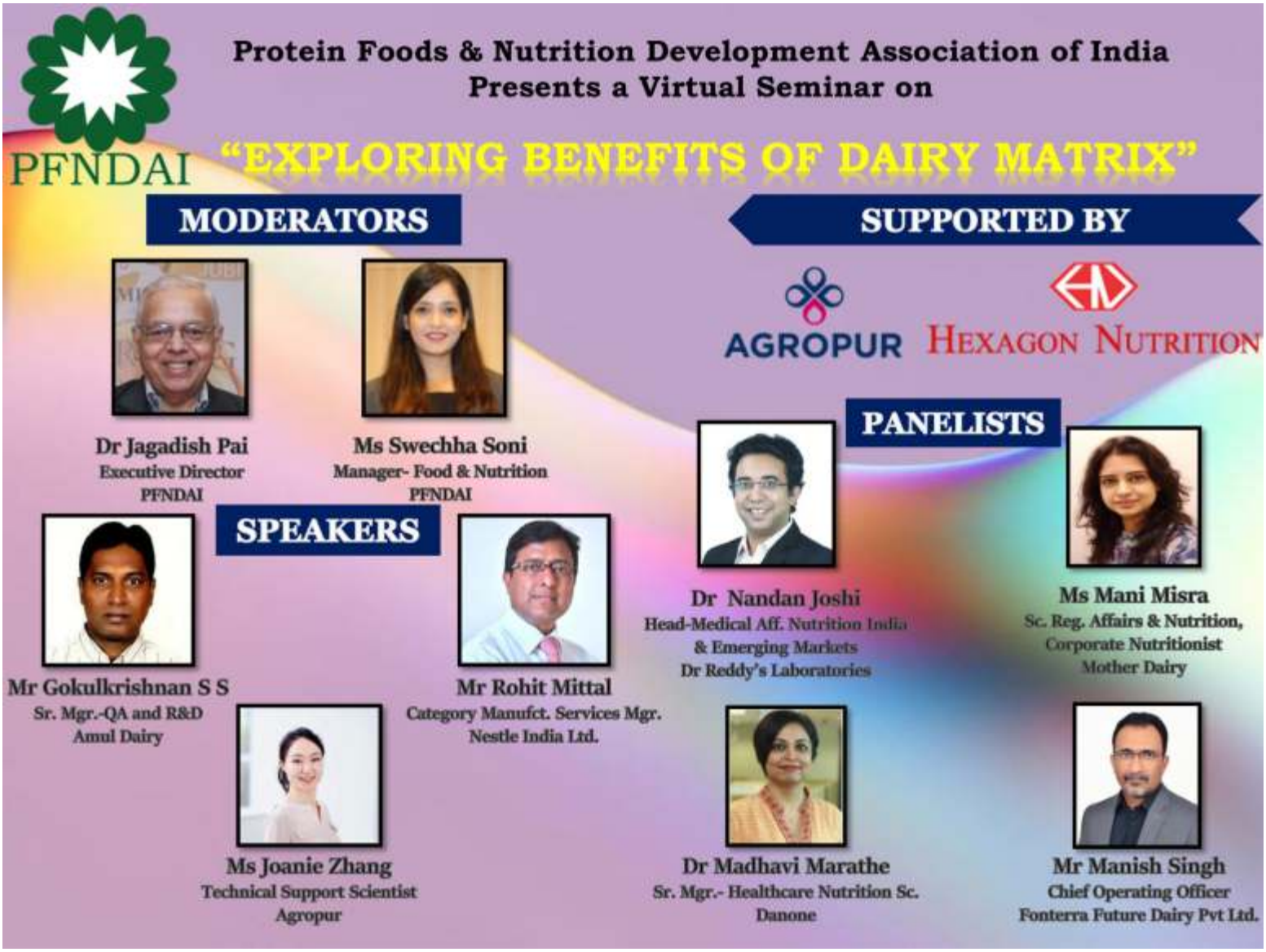
Protein Foods & Nutrition Development Association of India
Presents a Virtual Seminar on
PFNDAI
"EXPLORING BENEFITS OF DAIRY MATRIX"
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Dr Reddy's Laboratories
Ms Mani Misra
Sc. Reg. Affairs & Nutrition, Corporate Nutritionist
Mother Dairy
Mr Gokulkrishnan S S
Sr. Mgr.-QA and R&D
Amul Dairy
Mr Rohit Mittal
Category Manufct. Services Mgr.
Nestle India Ltd.
Ms Joanie Zhang
Technical Support Scientist
Agropur
Dr Madhavi Marathe
Sr. Mgr.- Healthcare Nutrition Sc.
Danone
Mr Manish Singh
Chief Operating Officer
Fonterra Future Dairy Pvt Ltd.

REGULATORY ROUND UP

By

Dr. N. Ramasubramanian,
Director, VR FoodTech,
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Dear Readers

Please find below FSSAI notifications, advisories, orders, etc since the last round up. There has not been many notifications possibly due to the raging second wave. Please take all the care and stay safe.

Advisories and Orders, Guidance Notes and Others

FSSAI recognizes additional laboratories in the northern and southern regions of India

FSSAI vide its letter dated 24 May 2021 details the implementation of policy for the auto generation of licenses and registrations in its version 2.0. The document specifies the conditions under which the licenses will be generated and issued automatically for different kinds of business. For example, a manufacturer, after responding to a query from FSSAI, does not get any response from the officials for 60 days, the system will automatically grant the license.

FSSAI permits migration of license from State to Centre without change in the license number. Good move as it saves packaging material.

FSSAI mandates mentioning of License/Registration number on the receipts/invoices/cash memos issued by the Food Business Operators (FBOs) while effecting the sale of food products. This requirement is essentially for traceability of FBOs like mithai shops, small caterers, etc. These FBOs usually sell foods which are not pre-packaged and hence not likely to carry any FSSAI number. With this condition, one may be able to trace the source in case of an adverse event. However, this is already a requirement through guarantee form (Form E of Licensing and Registration Regulation, 2011) for the major FBOs while generating the invoices.

FSSAI vide its notice 08 June 2021 instructs its officers to ensure that mustard oil is not used as a part of blended edible vegetable oil.

FBOs were requested to align their licenses with the type of business activities through modification process.
This deadline has now been extended to 31 October 2021 without modification fee and to 31 December 2021 with modification fee.

RESEARCH IN HEALTH & NUTRITION

Vitamin D combos revitalize bone health relevance: Vitamin K2, calcium and probiotics spotlighted

17 Mar 2021 Nutrition Insight

While vitamin D has enjoyed heightened consumer consideration due to its connection with COVID-19, it remains a key strategy to preventing bone health damage, such as osteoporosis. NutritionInsight discusses how vitamin D combined with vitamin K2 is gaining industry.

For the elderly, mobility is a requirement for active aging, says Dr. Laetitia Petrussa, product manager at IFF Health. "Osteoporosis and bone fragility often go unnoticed until they break, at which point it is too late. Mobility is essential for independence, autonomy, overall life satisfaction and general quality of life. Besides regular exercise, preserving bone strength is an important factor in preventing fractures and the sudden loss of mobility," Petrussa affirms.

Balancing vitamin synergies

Combination products featuring Vitamins D3 and K2 to support bone health have been on the market for some time, says Kate Quackenbush, NattoPharma. Like vitamin D3, vitamin K2 is a fat-soluble vitamin. Vitamin K2 can improve the functional balance of key systems – namely the skeletal and cardiovascular systems – that ensure robust and active health. "While K2 is required to activate K-dependent proteins, such as osteocalcin for bone health and matrix Gla protein (MGP) to inhibit soft tissue calcification, vitamin D3 is needed to create these proteins," says Quackenbush. "But if we are not balancing our D3 intakes with K2, we simply have an excess of inactive proteins not performing their function."

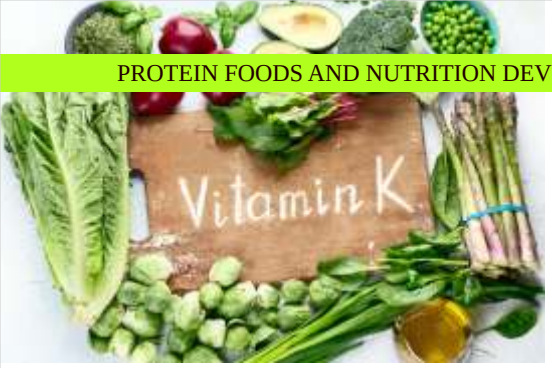
Completing the trifecta with calcium

Calcium remains a key ingredient for maintaining bone health. Innova Market Insight data reveals that calcium was the top ingredient used in 36 percent of F&B and supplement launches tracked with a bone and joint health claim (Global, 2020). However, the combination of only calcium and vitamin D provides "an incomplete solution," flags Büttinghaus. "Only vitamin K2 activates the proteins provided by vitamin D." NattoPharma's Quackenbush adds that calcium on its own can create "an undesirable seesaw effect." On one side, incoming calcium helps build bone. In the opposite direction, calcium tends to settle inside arteries and soft tissues, causing them to stiffen like concrete and impede blood flow. "Vitamin K2 activates proteins already present in the body that help the body to utilize calcium properly," she explains. MGP inhibits calcium from depositing in arteries and soft tissues, while osteocalcin binds calcium to the bone mineral matrix for stronger bones and teeth.

Clean label solutions:

Only products containing calcium, magnesium, manganese, phosphor, vitamin C, D or K can claim bone health benefits on their label, highlights Petrussa. "Therefore, consumers often resort to products that have been used in traditional medicine for specific benefits like bone health." Soybeans are a rich source of vitamin K, and Petrussa adds isoflavones from soy, for example, have been used in supportive products for women for millennia.

Supplements combining vitamins K2 and D3 to support calcium is crucial for those seeking optimal bone and cardiovascular health, says Quackenbusch.



More promise for probiotics?

According to Jakob Axelsson, research manager at BioGaia, the probiotic strain Limosilactobacillus reuteri ATCC PTA 6475 has been shown to change the relationship between different types of T-cells in preclinical trials. “This change results in a decreased formation and activation of osteoclasts, tilting the balance in favour of the osteoblasts, subsequently increasing bone density,” he explains. The positive effects of L. reuteri 6475 on bone health were further confirmed in a randomized, double-blind, placebo-controlled study in 90 women with incipient osteoporosis. The results showed that daily supplementation of L. reuteri 6475, combined with 5 µg (200 IU) of vitamin D3 for 12 months reduced bone loss with almost half, compared to placebo.

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“The pharmaceuticals of today, bisphosphonates for example, are effective but often cause several side effects,” says Axelsson, noting a spiked demand for osteoporosis prevention alternatives. “As an increasing bulk of research on probiotics indicates positive effects on bone health, there is a potential for specific probiotics to become a valuable alternative and an additional tool in the care of patients with osteopenia /osteoporosis.” Axelsson concludes approximately a third of women and a fifth of men over the age of 50 are at risk of suffering a fracture caused by osteoporosis. “Thus, the medical need is large and will increase further.”

By Anni Schleicher

Study strengthens links between red meat and heart disease

April 15, 2021 Science Daily

An observational study in nearly 20,000 individuals has found that greater intake of red and processed meat is associated with worse heart function.

"Previous studies have shown links between greater red meat consumption and increased risk of heart attacks or dying from heart disease," said study author Dr. Zahra Raisi-Estabragh of Queen Mary University of London, UK. "For the first time, we examined the relationships between meat consumption and imaging measures of heart health. This may help us to understand the mechanisms underlying the previously observed connections with cardiovascular disease.” The study included 19,408 participants of the UK Biobank. The researchers examined associations of self-reported intake of red and processed meat with heart anatomy and function.

Three types of heart measures were analysed. First, cardiovascular magnetic resonance (CMR) assessments of heart function used in clinical practice such as volume of the ventricles and measures of the pumping function of the ventricles. Second, novel CMR

radiomics used in research to extract detailed information from heart images such as shape and texture (which indicates health of the heart muscle). Third, elasticity of the blood vessels (stretchy arteries are healthier). The analysis was adjusted for other factors that might influence the relationship including age, sex, deprivation, education, smoking, alcohol, exercise, high blood pressure, high cholesterol, diabetes, and body mass index (BMI) as a measure of obesity.

The researchers found that greater intake of red and processed meat was associated with worse imaging measures of heart health, across all measures studied. Specifically, individuals with higher meat intake had smaller ventricles, poorer heart function, and stiffer arteries -- all markers of worse cardiovascular health. As a comparison, the researchers also tested the relationships between heart imaging measures and intake of oily fish, which has previously been linked with better heart health. They found that as the amount of oily fish consumption rose, heart function improved, and arteries were stretchier.

Dr. Raisi-Estabragh said: "The findings support prior observations linking red and processed meat consumption with heart disease and provide unique insights into links with heart and vascular structure and function." The associations between imaging measures of heart health and meat intake were only partially explained by high blood pressure, high cholesterol, diabetes, and obesity. "It has been suggested that these factors could be the reason for the observed relationship between meat and heart disease," said Dr. Raisi-Estabragh. "For example, it is possible that greater red meat intake leads to raised blood cholesterol and this in turn causes heart disease. Our study suggests that these four factors do play a role in the links between meat intake and heart health, but they are not the full story."

She noted that the study did not look into alternative mechanisms. But she said: "There is some evidence that red meat alters the gut microbiome, leading to higher levels of certain metabolites in the blood, which have in turn been linked to greater risk of heart disease." Dr. Raisi-Estabragh said, "This was an observational study and causation cannot be assumed. But in general, it seems sensible to limit intake of red and processed meat for heart health reasons."

Anti-aging compound improves muscle glucose metabolism in people

April 22, 2021 Science Daily

A natural compound previously demonstrated to counteract aspects of aging and improve metabolic health in mice has clinically relevant effects in people, according to new research at Washington University School of Medicine in St. Louis.

A small clinical trial of postmenopausal women with prediabetes shows that the compound NMN (nicotinamide mononucleotide) improved the ability of insulin to increase glucose uptake in skeletal muscle, which often is abnormal in people with obesity, prediabetes or Type 2 diabetes. NMN also improved expression of genes that are involved in muscle structure and remodelling. However, the treatment did not lower blood glucose or blood pressure, improve blood lipid profile, increase insulin sensitivity in the liver, reduce fat in the liver or decrease circulating markers of inflammation as seen in mice.

Among the women in the study, 13 received 250 mg of NMN orally every day for 10 weeks, and 12 were given an inactive placebo every day over the same period.

"Although our study shows a beneficial effect of NMN in skeletal muscle, it is premature to make any clinical recommendations based on the results from our study," said senior investigator Samuel Klein, MD, the William H. Danforth Professor of Medicine and Nutritional Science and director of the Center for Human Nutrition. "Normally, when a treatment improves insulin sensitivity in skeletal muscle, as is observed with weight loss or some diabetes medications, there also are related improvements in other markers of metabolic health, which we did not detect in our study participants."

The remarkable beneficial effects of NMN in rodents have led several companies in Japan, China and in the U.S. to market the compound as a dietary supplement or a nutraceutical. The U.S. Food and Drug Administration is not authorized to review dietary supplement products for safety and effectiveness before they are marketed, and many people in the U.S. and around the world now take NMN despite the lack of evidence to show clinical benefits in people.

The researchers studied 25 postmenopausal women who had prediabetes, meaning they had higher than normal blood sugar levels, but the levels were not high enough to be diagnosed as having diabetes. Women were enrolled in this trial because mouse studies showed NMN had the greatest effects in female mice.

NMN is involved in producing an important compound in all cells, called nicotinamide adenine dinucleotide (NAD). NAD plays a vital role in keeping animals healthy. Levels of NAD decline with age in a broad range of animals, including humans, and the compound has been shown to contribute to a variety of aging-associated problems, including insulin resistance in studies conducted in mice. Supplementing animals with NMN slows and ameliorates age-related decline in the function of many tissues in the body.

Co-investigator Shin-ichiro Imai, MD, PhD, a professor of developmental biology and of medicine who has been studying NMN for almost two decades and first reported on its benefits in mice said, "This is one step toward the development of an anti-aging intervention, though more research is needed to fully understand the cellular mechanisms responsible for the effects observed in skeletal muscle in people."

Insulin enhances glucose uptake and storage in muscle, so people who are resistant to insulin are at increased risk for developing Type 2 diabetes. But the researchers caution that more studies are needed to determine whether NMN has beneficial effects in the prevention or management of prediabetes or diabetes in people. Klein and Imai are continuing to evaluate NMN in another trial involving men as well as women.

One cup of leafy green vegetables a day lowers risk of heart disease

May 4, 2021 Science Daily

New Edith Cowan University (ECU) research has found that by eating just one cup of nitrate-rich vegetables each day people can significantly reduce their risk of heart disease.

The study investigated whether people who regularly ate higher quantities of nitrate-rich vegetables, such as leafy greens and beetroot, had lower blood pressure, and it also examined whether these same people were less likely to be diagnosed with heart disease many years later. Cardiovascular diseases are the number one cause of death globally, taking around 17.9 million lives each year. Researchers examined data from over 50,000 people residing in Denmark taking part in the Danish Diet, Cancer, and Health Study over a 23-year period. They found that people who consumed the most nitrate-rich vegetables had about a 2.5 mmHg lower systolic blood pressure and between 12 to 26 percent lower risk of heart disease.

Lead researcher Dr Catherine Bondonno from ECU's Institute for Nutrition Research said identifying diets to prevent heart disease was a priority. "Our results have shown that by simply eating one cup of raw (or half a cup of cooked) nitrate-rich vegetables each day, people may be able to significantly reduce their risk of cardiovascular disease. The greatest reduction in risk was for peripheral artery disease (26 percent), a type of heart disease characterised by the narrowing of blood vessels of the legs. However we also found people had a lower risk of heart attacks, strokes and heart failure."

Forget the supplements

The study found that the optimum amount of nitrate-rich vegetables was one cup a day and eating more than that did not seem to give any additional benefits. "People don't need to be taking supplements to boost their nitrate levels because the study showed that one cup of leafy green vegetables each day is enough to reap the benefits for heart disease," Dr Bondonno said. "We did not see further benefits in people who ate higher levels of nitrate rich vegetables."

Smoothies are ok

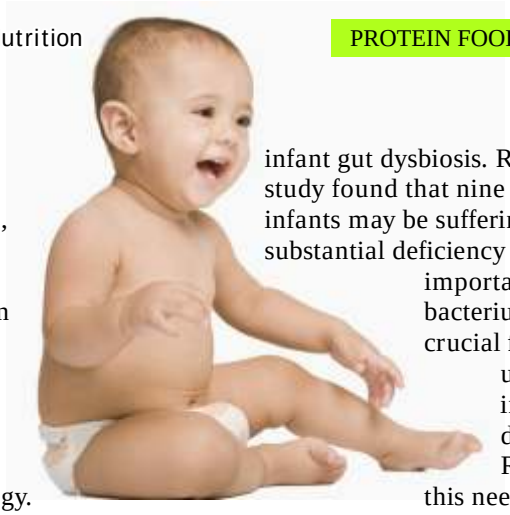
Dr Bondonno said hacks such as including a cup of spinach in a banana or berry smoothie might be an easy way to top up our daily leafy greens. "Blending leafy greens is fine, but don't juice them. Juicing vegetables removes the pulp and fibre," Dr Bondonno said. The research adds to growing evidence linking vegetables generally and leafy greens specifically with improved cardiovascular health and muscle strength. This evidence includes two recent ECU studies exploring cruciferous vegetables and blood vessel health and green leafy vegetables and muscle strength.

Probiotic stays in breast milk-fed babies' guts for one year, finds UC Davis study

25 Mar 2021 Nutrition Insight

Breast milk-fed babies can benefit from supplementation with the probiotic B. infantis as it persists in the baby's gut for up to one year and plays a valuable role in a healthy digestive system. This is according to research from the University of California, Davis, published in the journal Pediatric Research.

"The same group had shown in a previous study that giving breast milk-fed babies B. infantis had



beneficial effects that lasted up to 30 days after supplementation, but this is the first study to show persistent colonization up to one year of age," says lead author Jennifer Smilowitz, from the UC Davis Department of Food Science and Technology. Smilowitz was surprised the probiotic persisted for that amount of time because probiotics are short-lived, and 12-month-old infants given breast milk are also usually eating solid foods, which affect the gut microbiome.

Supporting babies' gut

B. infantis helps babies digest complex sugars, known as oligosaccharides, found in human breast milk. The bacterium was once commonly found in breastfed babies. If has largely disappeared in infants in industrialized countries. The dramatic decrease is believed to be due to increased antibiotic use, formula feeding and caesarean sections. "B. infantis is like the gatekeeper of the infant gut. It eats these complex sugars and creates an undesirable environment for potential pathogens," Smilowitz explains. She flags that the lack of B. infantis has played a role in the rise of inflammatory diseases such as allergies, asthma and autoimmune diseases. "Previous research has shown that colonization of B. infantis in the infant gut decreases intestinal inflammation," Smilowitz notes. In a previous study by Smilowitz and a team of researchers, babies were supplemented with B. infantis from seven days to 28 days after birth. They found persistent colonization for up to 30 days after supplementation. In this follow-up study, fecal samples were taken from those infants at 4, 6, 8, 10 and 12 months of age.

Infant gut dysbiosis

The study results come as focus is increasingly turning toward fighting infant gut dysbiosis. Recently, a US study found that nine out of ten infants may be suffering from a substantial deficiency in an important gut bacterium, which is crucial for breast milk utilization and immune system development. Recognizing this need, Bubs Australia launched Vita Bubs, a range of supplements that includes goat milk, lactoferrin, colostrum and probiotics to address immunity, digestive and cognitive health in infants.

Zooming in on baby health

A slew of studies addressing infant health is surfacing amid mounting immunity concerns. A new University of Missouri (MU) study found that docosahexaenoic acid (DHA) supplementation may offset the impact of maternal stress on unborn male babies. Neuro-developmental disorders like autism and schizophrenia disproportionately affect males and are directly linked to early life adversity caused by maternal stress and other factors, which might be impacted by nutrition, the study says. "We believe differences in metabolic requirements for male and female embryos as early as the first trimester, combined with dynamic differences in the way the male and female placenta reacts to environmental factors, contribute to the increased risk for male neuro-developmental disorders later in life," says senior author David Beversdorf from MU. Meanwhile, a Danish-US study found that the more nitrate there is in pregnant mothers' drinking water, the smaller the babies they give birth to are. Importantly, the declining birth weight can also be registered when the women are exposed to nitrate levels below the EU's threshold of 50 milligrams of nitrate per litre.

Lastly, for premature infants who can't breastfeed on their own, mother's own milk (MOM) is by far the best nutrition, especially for preterm infants born to Black and Hispanic mothers. This is the conclusion of a review in Advances in Neonatal Care, the official journal of the National Association of Neonatal Nurses. The review says there is an urgent need for effective ways to increase the relatively low rates of MOM feeding in these populations.

By Kristiana Lalou

Vitamin D in moderation protects against respiratory infections: Meta-analysis

By Danielle Masterson 05-Apr-2021-
Food Navigator USA

According to researchers, the study is the most comprehensive yet to focus on vitamin D and respiratory infections and could have significant implications for healthcare providers.

A new study, published in The Lancet Diabetes & Endocrinology , has found that daily doses of 400-1000 IU are associated with protection against acute respiratory infections, but that higher doses are not. Four years ago, a meta-analysis of data from 25 randomized controlled trials of vitamin D supplementation for the prevention of acute respiratory infections showed a protective effect of this intervention. Now, the same researchers from, amongst other institutes, Karolinska Institutet, Harvard Medical School and Queen Mary University of London, have expanded the earlier research with an additional 18 studies and updated meta-analysis.

Because studies that do not demonstrate an effect are never published, a false impression of how effective vitamin D is can create a 'publication bias.' To compensate for this, data from registered but as yet unpublished studies was also included in the meta-analysis. The current research based their results on 43 randomized and placebo-controlled studies on the possible relationship between vitamin D and respiratory infections of nearly 49,000 participants. According to lead researcher Professor Adrian Martineau at Queen Mary University of London, vitamin D prevents respiratory infections by boosting a range of innate antiviral responses, while simultaneously dampening down potentially harmful inflammatory responses.

The research found that a daily dose of vitamin D to be much more effective than weekly or monthly doses. "We showed that daily doses of 400-1000 IU were associated with protection against acute respiratory infections, but that higher doses were not," Martineau told NutraIngredients-USA. "A particularly high dose doesn't seem necessary," added study co-author Peter Bergman, associate professor at the Department of Laboratory Medicine, Karolinska Institutet. "Those who received 400-1000 IU/day had the best response, as the group that received such a dose demonstrated a reduction in infection risk of 42%. I want to stress that there were no signals in the study that normal doses of vitamin D were dangerous or caused adverse reactions."

Martineau told us that the research presented three surprises:

"We didn't replicate a previous finding that protection was stronger in those with the lowest vitamin D levels at baseline. This may reflect inclusion of results from several recent large studies in which vitamin D was given monthly or weekly – which appears to be less effective than daily dosing; Finding above, that modest doses may protect better than higher doses; and appearance of funnel plot, showing that publication bias may be contributing to finding of a protective effect." According to Martineau, age, baseline vitamin D level, and body mass index should all be considered when determining who and how much vitamin D one should receive.

Bergman said that healthcare providers should keep in mind certain populations with known risk of vitamin D deficiency, such as people with dark skin, overweight people and the elderly. "A daily dose of vitamin D can protect the bones and perhaps also reduce the risk of respiratory infections invulnerable groups," said Bergman. "The wider population will probably not benefit as much from the supplement, though. Vitamin D doesn't make healthy people healthier."

The relevance of these findings to COVID-19 is not known and requires further investigation, which is currently underway. "We are running the CORONAVIT trial here in the UK – 6200 participants, follow-up is half way through now," said Martineau.

Healthy aging strides: GlyNAC supplementation improves muscle strength and cognition, says US study

30 Mar 2021 Nutrition Insight

Supplementation with GlyNAC may improve a range of age-associated defects in older people, such as improving muscle strength and cognition and promoting healthy aging. This is according to a pilot human clinical trial conducted by researchers at Baylor College of Medicine, within the University in Houston, Texas, US. GlyNAC is a combination of glycine and N-acetylcysteine as precursors of the natural antioxidant glutathione.

"It is believed that correcting certain aging hallmarks could improve or reverse many age-related disorders and help people age in a healthier way," says co-author Dr. Rajagopal Sekhar, associate professor of medicine in the Section of Endocrinology, Diabetes and Metabolism at Baylor. "However, we do not fully understand why these hallmark defects happen, and there are currently no solutions to fix even a single hallmark defect in aging." After taking GlyNAC for 24 weeks, all these defects in older adults improved and some reversed to the levels found in young adults, he says.

The researchers also determined that older adults tolerated GlyNAC well for 24 weeks. The benefits, however, declined after stopping GlyNAC supplementation for 12 weeks. Consumers are increasingly seeking a holistic approach to healthy aging, according to an Innova Market Insights survey. The research reveals that seven out of ten consumers have made changes across the past year to improve their health.

Slowing down aging

The results study was published in the journal Clinical and Translational Medicine, and showed that supplementation with GlyNAC ameliorated many characteristic defects of aging. These include glutathione deficiency, oxidative stress, mitochondrial dysfunction, inflammation, insulin resistance, endothelial dysfunction, body fat, genomic toxicity, muscle strength, gait speed, exercise capacity and cognitive function.

"There is limited understanding as to why these defects occur in older humans, and effective interventions to reverse these defects are currently limited or lacking," says Sekhar. For the last 20 years, Sekhar and his team have been studying natural aging in older humans and aged mice. Their work brings mitochondria, known as the batteries of the cell, as well as free radicals and glutathione, to the table in discussions about why we age.

Mitochondrial dysfunction

Mitochondria generate the energy needed for supporting cellular functions by burning fat and sugar from foods. Therefore, mitochondrial health is critically important for life. Sekhar believes that improving the health of malfunctioning mitochondria in aging is the key. As mitochondria generate energy, they produce waste products such as free radicals. These highly reactive molecules can damage cells, membranes, lipids, proteins and DNA.

Cells depend on antioxidants, such as glutathione, the most abundant antioxidant in the cells, to neutralize these toxic free radicals. Failing to neutralize free radicals can lead to harmful and damaging oxidative stress that can affect mitochondrial function. Notably, glutathione levels in older people are much lower than those in younger people, and the levels of oxidative stress are much higher.

Animal studies conducted in the Sekhar lab have shown that restoring glutathione levels by providing GlyNAC reverses glutathione deficiency, reduces oxidative stress and fully restores mitochondrial function in aged mice. "In previous work, we showed that supplementing HIV patients with GlyNAC improved multiple deficits associated with premature aging observed in those patients," Sekhar notes. "In this study, we wanted to understand the effects of GlyNAC supplementation on many age-associated defects in older adults."

Improving hallmark aging defects

The world population of older humans is rapidly increasing and with it comes an increase in many age-related illnesses, say the researchers. To understand what causes unhealthy aging, the research identified nine hallmark defects that are believed to contribute to the aging process. In this context, Sekhar's trial results are important, as GlyNAC supplementation for 24 weeks appears to improve four of the nine aging hallmark defects. "We worked with eight older adults 70 to 80 years of age, comparing them with gender-matched younger adults between 21 and 30 years old," Sekhar says.

Before taking GlyNAC, all measurements were abnormal in older adults when compared with those in younger people, he explains. The older participants took GlyNAC for 24 weeks and then stopped it for 12 weeks. Sekhar and his colleagues repeated the above measurements at the halfway point at 12 weeks, after 24 weeks of taking GlyNAC and again after stopping GlyNAC for 12 weeks.

"I am particularly encouraged by the improvements in cognition and muscle strength," Sekhar says. "Alzheimer's disease and mild cognitive impairment (MCI) are serious medical conditions affecting memory in older people and leading to dementia, and there are no effective solutions for these disorders."

"We are exploring the possibility that GlyNAC could help with these conditions by conducting two pilot randomized clinical trials to test whether GlyNAC supplementation could improve defects linked to cognitive decline in Alzheimer's disease and possibly improve cognitive function," he says.

They suggest that GlyNAC supplementation could be a simple and viable method to promote and improve healthy aging in older adults. "We call this the 'Power of 3' because we believe that it takes the combined benefits of glycine, NAC and glutathione to reach this far-reaching and widespread improvement. We also have completed a randomized clinical trial on supplementing GlyNAC versus placebo in older adults and those results will be forthcoming soon," he concludes.

Edited by Kristiana Lalou

Childhood diet and exercise creates healthier, less anxious adults

April 9, 2021 Science Daily

Though diet and exercise are consistently recommended as ways to promote health, this study is the first to examine the long-lasting, combined effects of both factors when they are experienced early in life.

"Any time you go to the doctor with concerns about your weight, almost without fail, they recommend you exercise and eat less," said study lead and UCR physiology doctoral student Marcell Cadney. "That's why it's surprising most studies only look at diet or exercise separately. In this study, we wanted to include both."

The researchers determined that early-life exercise generally reduced anxious behaviours in adults. It also led to an increase in adult muscle and brain mass. When fed "Western" style diets high in fat and sugar, the mice not only became fatter, but also grew into adults that preferred unhealthy foods. These findings have recently been published in the journal Physiology and Behavior. To obtain them, the researchers divided the young mice into four groups -- those with access to exercise, those without access, those fed a standard, healthy diet and those who ate a Western diet.

Mice started on their diets immediately after weaning, and continued on them for three weeks, until they reached sexual maturity. After an additional eight weeks of "washout," during which all mice were housed without wheels and on the healthy diet, the researchers did behavioural analysis, measured aerobic capacity, and levels of several different hormones.

One of those they measured, leptin, is produced by fat cells. It helps control body weight by increasing energy expenditure and signalling that less food is required. Early-life exercise increased adult leptin levels as well as fat mass in adult mice, regardless of the diet they ate.

Previously, the research team found that eating too much fat and sugar as a child can alter the microbiome for life, even if they later eat healthier. Going forward, the team

plans to investigate whether fat or sugar is more responsible for the negative effects they measured in Western-diet-fed mice. Together, both studies offer critical opportunities for health interventions in childhood habits.

"Our findings may be relevant for understanding the potential effects of activity reductions and dietary changes associated with obesity," said UCR evolutionary physiologist Theodore Garland. In other words, getting a jump start on health in the early years of life is extremely important, and interventions may be even more critical in the wake of the pandemic.

"During the COVID-19 lockdowns, particularly in the early months, kids got very little exercise. For many without access to a park or a backyard, school was their only source of physical activity," Cadney said. "It is important we find solutions for these kids, possibly including extra attention as they grow into adults."

Given that exercise was also shown to reduce adult anxiety, Cadney believes children who face these challenges may face unique physical and mental health issues as they become adults in the coming decade.

Why some of us are hungry all the time

April 12, 2021, Science Daily

New research shows that people who experience big dips in blood sugar levels, several hours after eating, end up feeling hungrier and consuming hundreds more calories during the day than others.

A study published today in Nature Metabolism, from PREDICT, the largest ongoing nutritional research program in the world that looks at responses to food in real life settings. The research team from King's College London and health science company ZOE (including scientists from Harvard Medical School, Harvard T.H. Chan School of Public Health, Massachusetts General Hospital, the University of Nottingham, Leeds University, and Lund University in Sweden) found why some people struggle to lose weight. This occurred even on calorie-controlled diets. It highlights the importance of understanding personal metabolism when it comes to diet and health.

The research team collected detailed data about blood sugar responses and other markers of health from 1,070 people after eating standardized breakfasts and freely chosen meals over a two-week period, adding up to more than 8,000 breakfasts and 70,000 meals in total. The standard breakfasts were based on muffins containing the same amount of calories but varying in composition in terms of carbohydrates, protein, fat and fibre. Participants also carried out a fasting blood sugar response test (oral glucose tolerance test), to measure how well their body processes sugar.

Participants wore stick-on continuous glucose monitors (CGMs) to measure their blood sugar levels over the entire duration of the study, as well as a wearable device to monitor activity and sleep. They also recorded levels of hunger and alertness using a phone app, along with exactly when and what they ate over the day.

Previous studies looking at blood sugar after eating have focused on the way that levels rise and fall in the first two hours after a meal, known as a blood sugar peak. However, after analyzing the data, the PREDICT team noticed that some people experienced significant 'sugar dips' 2-4 hours after this initial peak, where their blood sugar levels fell rapidly below baseline before coming back up.

Big dippers had a 9% increase in hunger, and waited around half an hour less, on average, before their next meal than little dippers, even though they ate exactly the same meals.

Big dippers also ate 75 more calories in the 3-4 hours after breakfast and around 312 calories more over the whole day than little dippers. This kind of pattern could potentially turn into 20 pounds of weight gain over a year.

Dr Sarah Berry from King's College London said, "It has long been suspected that blood sugar levels play an important role in controlling hunger, but the results from previous studies have been inconclusive. We've now shown that sugar dips are a better predictor of hunger and subsequent calorie intake than the initial blood sugar peak response after eating, changing how we think about the relationship between blood sugar levels and the food we eat."

Professor Ana Valdes from the School of Medicine at the University of Nottingham, who led the study team, said: "Many people struggle to lose weight and keep it off, and just a few hundred extra calories every day can add up to several pounds of weight gain over a year. Our discovery that the size of sugar dips after eating has such a big impact on hunger and appetite has great potential for helping people understand and control their weight and long-term health."

Comparing what happens when participants eat the same test meals revealed large variations in blood sugar responses between people. The researchers also found no correlation between age, bodyweight or BMI and being a big or little dipper, although males had slightly larger dips than females on average.

There was also some variability in the size of the dips experienced by each person in response to eating the same meals on different days, suggesting that whether you're a dipper or not depends on individual differences in metabolism, as well as the day-to-day effects of meal choices and activity levels.

Choosing foods that work together with your unique biology could help people feel fuller for longer and eat less overall.

Lead author on the study, Patrick Wyatt from ZOE, notes, "This study shows how wearable technology can provide valuable insights to help people understand their unique biology and take control of their nutrition and health. By demonstrating the importance of sugar dips, our study paves the way for data-driven, personalized guidance for those seeking to manage their hunger and calorie intake in a way that works with rather than against their body."

Tim Spector, Professor of Genetic Epidemiology at King's College London and scientific co-founder of ZOE, concludes, "Food is complex and humans are complicated, but our research is finally starting to open up the black box between diet and health. We're excited to have been able to turn this cutting-edge science into an at-home nutrition and microbiome test so that everyone has the opportunity to discover their unique responses to food to best support their metabolism and gut health."

FOOD SCIENCE & INDUSTRY NEWS

What's next in nutrition bars? Nellson highlights sugar, protein and fibre trends

22 Mar 2021 Nutrition Insight

Nutrition bars have been a rapidly evolving product category since their inception in the US by NASA, which in 1962, developed a non-frozen, balanced energy stick in rod form containing nutritionally balanced amounts of carbohydrate, fat and protein. Since then, nutrition bars have come a long way, asserts Nellson nutrition bar and functional powder specialist. Consumer demographics and psychographics have changed and flavours and formats have evolved.

"The market today is focussed on delivering better taste and textures – and an ever-increasing array of functional benefits. From plant-based proteins to low carb solutions, probiotics and more, we move quickly to help brands get it right and get to market fast," says Nellson's chief commercial officer Bart Child.

Rethinking protein

Protein content has long been a key purchase driver in nutrition bars, notes Nellson. Athletes use nutrition bars with high protein content to elevate performance and rebuild muscle after workouts, while dieters snack on these to remain satiated between meals. Nellson highlights research showing 52 percent of consumers say protein quantity is important to them when choosing a nutrition bar, while 34 percent say protein source is important. With new sources of protein hitting the market, however, manufacturers are facing new development challenges. "While many athletes still swear by whey protein, other consumers are getting comfortable with plant-based sources like pea, rice and soy. High levels of plant-based proteins can lead to drying and hardening over shelf life, chalkiness, vegetal off-notes and non-enzymatic browning," notes Nellson.

Soy has fewer problems as a protein source but is often viewed by consumers with a "slightly negative" perception. Nellson, therefore, advises that the difficulties associated with pea and rice proteins should be addressed. "Formulators must screen multiple raw materials and carefully select the best combination for each application. They must explore congruent flavour profiles and masking technologies. It can all be done – and quite well – but it takes real expertise." Newer protein sources like pumpkin, sunflower and fava bean have begun to emerge, and each will present fresh challenges for industry.

The sugar challenge

Last year, the US Food and Drug Administration (FDA) introduced new labelling challenges that significantly affect the nutrition bar market. Nutrition facts panels must now indicate the amount of added sugars and total sugars. Furthermore, brands can only count dietary fibre from particular sources. In terms of sugar content, Nellson notes formulators are trying to reduce both naturally occurring sugars (such as those in fruit chunks) and added sugars. This presents challenges, however. Sugar syrups bring essential functionality to nutrition bars by binding proteins and other inclusions and helping bars retain softness and pliability.

Removing the binding syrup entirely, as some keto-friendly bar products have done, requires tight manufacturing control to maintain product integrity. Other manufacturers have tried replacing sugar syrups with sugar alcohol like maltitol, which helps binding but has potential gastrointestinal side effects. Using fibre syrups is another alternative but can be very drying without sophisticated formula optimization.

Fibre Challenge

Problems with fibre formulation are also tricky, notes Nellson. Under the new FDA regulations, carbohydrates may only be declared as fibre if they are "intact, naturally occurring as a plant ingredient, or deemed to provide positive physiological benefits to human health." This poses many reformulation headaches, concedes the company. For example, a common binder in low-carb bars – isomalto-oligosaccharides (IMO) – was not approved as a fibre source by the FDA. Fibre content consequently dropped after the ruling, while sugars and carbohydrates went through the roof.

Now, brands leveraging this ingredient are scrambling for other fibre sources or sugar alcohol syrups to bring their net carbs back down.
Edited by Louis Gore-Langton

Immunity, probiotics and protein drive sports nutrition as COVID-19 boosts consumer demand for athletic enhancers

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The COVID-19 pandemic has acted as a catalyst on the sports nutrition industry, propelling consumer awareness and demand for products aiding athletic activities during lockdown measures. This, combined with continuous scientific advances, makes the sports nutrition sector "primed for major growth" in the future. NutritionInsight discusses these developments with experts from Beneo, Lonza and FrieslandCampina Ingredients.

Changing face of sports nutrition
The traditional distinctions setting sports nutrition apart are becoming more blurred. In the past, the industry was mainly defined by specialist supplements targeted at groups like bodybuilders and professional athletes. Vaughn DuBow, product manager at Lonza, looks back to Arnold Schwarzenegger as one of sports nutrition's founding fathers, a man who boasted of eating roughly ten to 15 eggs per day. "The science of sports nutrition has come a long way since those days. What was once 'eat more meat and potatoes' has transformed into an over US$20 billion industry of clinically-proven ingredients, technologically advanced ingredient delivery systems, and unique manufacturing processes that bring effective performance solutions to the masses," he remarks.

As science has advanced, so have consumer expectations. Broadening market demand means everyday people are seeking out ingredients once reserved for professional athletes. Konstantin Grissmer, product manager of functional carbohydrates at Beneo, notes how NPD targeting the masses has made regular foods, such as snack brands, turn sportive. This has enabled industry players to reach the occasionally active consumer, as well as professionals.

COVID-19 and lockdown athletics
While the pandemic has had a constraining impact on many areas of life due to lockdown measures, a surprising boom has been seen in sports nutrition. DuBow highlights research showing the rates of exercise increasing among consumers. "Beginning in June of 2020, 56 percent of consumers had increased their sports nutrition supplement use within the prior six weeks," he notes. "We've seen this growth taper going into 2021, with 34 percent of consumers still increasing sports supplement use. Yet, we still see that the majority of users who increased their usage remain committed to their new higher-dose routine."

Grissmer also highlights how the pandemic has developed a new area of at-home nutrition for sports endurance, particularly in the rise of e-gaming. Alternative carbohydrates like Beneo's Palatinose are offering healthier alternatives to caffeine, taurine and glucose products traditionally used to maintain concentration, he says. The higher dosage routine means that that "proverbial sports nutrition pie" has gotten larger, says DuBow. In particular, a merging of sports nutrition and immune health as "never seen before" is occurring. "Athletes are more aware of their immune system and their overall health, and now want products that not only will help them run faster or jump higher but also ones that support their overall health and well-being."

Immunity and probiotics
The growth in demand for immunity-boosting products has led to a surge in NPD. Floris Daamen, marketing manager of performance and active nutrition for FrieslandCampina Ingredients, highlights the company's work in answering these demands, saying this area will remain a fixture for some time. "Immunity awareness is high and will likely remain a long-term priority; a fact which led us to develop our range of Biotis Immune Health solutions," he remarks. "Some argue these trends will fall off the agenda once we eventually return to normality, but we will see. I believe they will be a characteristic of our industry for many years to come."

DuBow says Lonza expects similar longevity for the immunity trend in sports nutrition, adding that strain-specific probiotics are and will continue to lead the way. "As we begin to learn more about the human body, science has shown that there is an undeniable relationship between our gut and our overall health." Over 70 percent of the human immune system lives in the gut tissue, and as more people learn about the gut-brain axis, they're realizing probiotics aren't just for digestive health, he says.

Protein plus

Daamen emphasizes that protein continues to carry substantial weight in sports nutrition and that original innovation for supplements and products delivering protein holds a lucrative position for the market. "To take health and wellness even further, future innovation should also focus on the 'protein plus' trend," he explains. "Producers that move past traditional protein powders to products fortified with protein and additional health-supporting ingredients – such as prebiotics for digestive support or mental well-being benefits – will have the advantage as more consumers look for holistic products that offer a range of health benefits."

By Louis Gore-Langton

Thy not? Next Gen plucks for Singapore as it launches global plant-based chicken brand

By Guan Yu Limn01-Mar-2021- Food Navigator Asia

Plant-based food tech start up Next Gen is making its global debut by launching its consumer brand TiNDLE in Singapore this March.

The first product to be launched is TiNDLE Thy, a plant-based chicken thigh product which will be distributed by Classic Fine Foods, and rolled out initially in food service, with retail in the pipeline. The launch of the consumer brand comes after Singapore headquartered Next Gen closed a US$10 million seed round, more than its initial US$7 million target, following an earlier founder capitalisation of US$2.2million. TiNDLE Thy is said to be a versatile plant-based chicken product that can be shaped and cooked in various cuisines. It is mainly made from water, soy, coconut oil and Lipi, a special blend of plant-based fats and flavour to recreate the taste and aroma of chicken.

In an interview with FoodNavigator-Asia, Next Gen's co-founder and COO Andre Menezes said: "Consumers expect chicken to have the specific chicken texture, taste and smell. In terms of taste, most flavour typically come from chicken fat, so for TiNDLE, we replicate chicken fat using plant ingredients." Every 100g of TiNDLE contains 17g of protein, comparable to that of chicken.

According to Menezes, the product meets the Singapore Health Promotion Board's Healthier Choice Symbol for its lower sodium (180mg/100 g) and saturated fat content (1.88g/100g) compared to regular plant-based meat alternatives. TiNDLE Thy is sold frozen, and has an 18 month shelf life. The plan is to launch in restaurants first. "With TiNDLE Thy, we want to deliver a fantastic food experience, made from sustainable food," Menezes said. "Moving forward, as we expand the company and aim to create the maximum possible impact, we will go into retail with supermarket products."

With the global debut in Singapore, the company is eyeing expansion in big meat markets such as US, Europe, China and Brazil. In US, Next Gen is already recruiting a growth director, who will help build a network of distributors, restaurants, and chefs. Major Asian cities are also in its sights for future launches: "We are looking at developed, urban, highly connected cities in Asia with strong population demographics, and a good restaurant scene which are influential on the global or regional level ," he said.

Next Gen's asset-light business model means the company will not be operating its own factories but works with partners to manufacture and distribute the product. TiNDLE will be manufactured in the Netherlands, with a 5,000 tonnes capacity, enough for 9,000restaurants.

This year, all efforts will be driven to bring TiNDLE to the global stage: "We have developed a business model that is asset light and as such, we're able to scale very quickly, around the globe ," Menezes said.

With the new funding, Next Gen hopes to accelerate research and development of plant-based products, and increase product diversification. "This year, we are not planning to launch any other meat category, but we have ongoing developments for new products such as convenience foods."

REGULATORY NEWS

Hemp in India: 'Next wave' of food products expected this year when FSSAI regulations finalized

By Pearly Neo 23-Mar-2021- Food Navigator Asia

Upcoming hemp regulations set by the Food Safety and Security Authority of India (FSSAI) will be a crucial turning point for the local hemp and cannabis sector, unlocking its potential for use in the 'next wave' food and beverage products.

Thus far, hemp is largely unregulated in India, and various large-scale misunderstandings regarding its use as a food item have occurred at a national level, such as FSSAI's granting of licenses for hemp seed products in 2017 being followed by a warning letter to all manufacturers that there were 'no standards' for hemp in India at that point, and products were being sold 'illegally '. This lack of regulations was acknowledged as a 'crippling factor' for the industry and drove hemp sector players such as the Bombay Hemp Company (BOHECO) to work more closely with FSSAI to develop policies and standards. "We realised that for hemp to thrive as part of the F&B industry, the regulations needed to work with hemp had to take shape," BOHECO Co-Founder and Business Development Director Yash Kotak told FoodNavigator-Asia . "That is when we started working very closely with FSSAI as their knowledge/industry partners to provide them with all the necessary intel to develop a robust policy for hemp as a food source. "We couldn't wait for the regulations to come along before starting operations though, so whilst waiting for FSSAI we identified Ayurveda as a channel to popularize the edible uses for hemp - Yes, it wouldn't be as in dept has FSSAI but it at least was a start and under this licensing we already have hemp edibles such as hemp hearts(seeds), hemp powder and hemp seed oil."

FSSAI finally published its draft regulations containing the governance of hemp seeds and related products in October 2020, which is currently under review and expected to be finalised this year. When this happens, the 'next wave' for hemp products will arrive for India, according to Kotak. "The next wave of hemp moving from base ingredient form to value added products [is] something that's going to kick start massively in 2021 itself as soon as FSSAI regulates the use of hemp as a food source," he said. "In fact, a lot of people have experimented with hemp in multiple different forms such as chocolates, alcoholic beverages - there are two hemp-based gins already available in the Goa market, bars, pasta, protein blends, etc -The scope for partnerships and collaborations is going to increase multi-fold."

Hemp regulation as a food will fall under the Food Safety and Standards (Food Products Standards and Food Additives) Amendment Regulations, 2020. According to the draft regulations document, only hempseeds from industrial Cannabis sativa with a 0.3% concentration or less of the tetrahydrocannabinol (THC) cannabinoid (which causes the psychoactive 'high' sensation) can be used as food.

THC content in the seeds must not exceed 5mg/kg and content in the oil extracted from these seeds must not exceed 10mg/kg, whereas any beverages made from hemp seeds must not contain more than0.2mg/kg THC and hemp flour must not have more than 5mg/kg. "The level of cannabidiol (CBD) in any food for sale consisting of hemp seed or seed products shall not exceed 75mg/kg, [and] the product labels must not imply any psychoactive effect," said FSSAI. "The labels also cannot include any nutrition or health claims about CBD, any image/representation of the cannabis plant (including the leaf) other than the seeds, nor the words 'cannabis', 'marijuana' or words of similar meaning." Like many other countries worldwide, India has seen a rise in the health and wellness awareness trend in the past year since COVID-19 hit, which has helped BOHECO promote its hemp products as well.

"Hemp and CBD products fit perfectly given the current times [where] the importance of health in people's live[has been magnified]," said Kotak. "Some on-setting trends in India such as immunity building, mental health, vegan/vegetarian food choices, organic food and so on can see hemp and CBD fitting right in and having a direct impact. However, before the sector can reach its full potential, Kotak warned that consumer education and R&D in India needs to be seriously stepped up so that the industry can be standardised. "Major challenges still facing the hemp sector in India include the lack of education and R&D initiatives for the purpose of the crop's commercialisation - if the industry can't be standardized for input and output then the outcome will always suffer," he said.

Consumers want clearer, more consistent product information to facilitate omni-channel shopping

By Elizabeth Crawford
06-Apr-2021- Food Navigator Asia

As more consumers adopt a "research-online-buy-offline" approach, providing accurate, consistent product information across channels and on packaging is essential for driving discovery, initial trial and repeat purchases – and yet, most manufacturers fall woefully short of shopper expectations on this front, according to insights from the product experience management firm Akeneo and consumer-research firm IRI.

A staggering 75% of the 3,500 adults globally surveyed by Akeneo between Feb. 3-10, 2021, are not fully satisfied with the quality of product information available to them, including a notable 7% who say the information generally is very bad or somewhat bad. This shortcoming can have significant consequences for sellers, including lower conversion rates, fewer repeat customers, abandoned purchases and more, according to Akeneo's survey published this morning.
For example, Akeneo found, 72% of consumers would purchase another product due to bad product information and 74% would cease buying a brand due to bad product information. In addition, four out of five consumers say they have abandoned a planned purchase because of bad product information, and more than half have returned a product due to bad product information, Akeneo found.

While 32% of consumers who have abandoned a product due to lack of information say they have bought the same product through another sales channel, where ostensibly they have access to better information,36% have opted for a different product instead and 26% didn't buy anything at all, the survey revealed.

As quick as consumers are to punish brands and retailers for providing insufficient or inaccurate product information, they are willing to reward those that meet or exceed their expectations. According to Akeneo, half of all consumers are ready to pay more for good product information. One of the best ways to meet consumers' information expectations is to start with claims, storytelling and key information shared on product packaging because this is foundational for how goods are portrayed not just in store, but online through retailer websites and search engines, says IRI executive vice president and practice leader of climate insights Sally Lyons Wyatt. "Product labels are influencers," she told attendees not once – but twice – late last week during a webinar on the state of snacking in 2021 and beyond. "Your product package is the last billboard that you have online. It is the biggest billboard you have and you need to make sure that if you're a retailer that your images can be turned around and you can see all sides. If you're a manufacturer, work with that retailer, make sure that they have the right images and they have the right attributes aligned with your products," she explained.
Repeatedly stressing "this is so important," she noted IRI data found 55 of consumers are influenced byproduct labels and packaging, including 61% of 18 to 24-year-olds and 61% of 35 to 44-year-olds.

Beyond providing accurate information about products, companies also increasingly need to communicate their values through product information and across shopping channels to let consumers know where they stand, drive sales and potentially take higher price, suggests Akeneo's survey results. "The presence of brand values in product information would encourage more than one in two consumers to pay a higher price for a product that includes them," Akeneo found, noting 10% of survey respondents would pay up to 50% more for products from a company that shared its values, while 82% would pay a premium of30% or less.

At the top of the list of brand values that consumers told Akeneo they wanted to see on product information were certificates and quality labels (62%), followed by brand and product history (50%),respect for the environment and sustainability (49%) and product origin (46%). When it comes to certificates and quality labels, Lyons Wyatt noted sustainably-minded ones are increasingly important to shoppers looking for snacks. For example, she said, 44% of consumers say they want reduced packaging to be more environmentally friendly – up 6 points from 2018, and 38% say they want snacks in biodegradable packaging – up 7 points from 2018.
To find products that meet these standards, consumers are relying on products with sustainable certifications, including recyclable (11%), sustainably certified (12%), post-consumer recycled material (7%)and Rainforest Alliance Certified (5%).

Beyond sustainability, IRI found 11% of consumers look for ethical certifications, 20% for Fair Trade, 26%for Cage Free, 25% for B Corporation and 104% for humane, Lyons Wyatt said.
Finally, with regards to product origin, IRI found domestic snacks are driving double digit interest with those bearing a "Made in the USA" label growing 10%.

Food allergies in children: More credible labelling policies as well as avoiding cross contamination crucial –HealthNuts study lead

By Pearly Neo
05-Apr-2021- Food Navigator Asia

More effective policies to prevent allergen cross contamination are needed in Australia's food industry, while voluntary labelling needs to more accurately reflect the risk profile, said a lead investigator of HealthNuts, the world's largest comprehensive study on childhood food allergy.

The HealthNuts study has been ongoing for some 15 years, comprising data from children across Australia, Singapore, South Africa, 10 countries in Europe, the United Kingdom and the United States. According to HealthNuts project lead and Co-Group Leader of the Population Allergy group Dr Jennifer Koplin, there needs to be an effective strategy to protect children both pre and post allergy.

For the latter, she pointed out that allergen labelling could be confusing for parents. "When a child has already developed a food allergy, better allergy label usage, and parents reading these labels properly, is really important to protect them. Precautionary label usage in Australia is voluntary, which presents two issues: One is of course the uncertainty this presents, as it is hard to tell whether a food product does not carry a label because there is truly no risk of allergen cross-contamination in the food, or because the manufacturer simply decided not to use it. Here, parents will need to read ingredients carefully to prevent allergic reactions.

"The other is ironically the problem of over-usage, where some manufacturers are using these extremely commonly and end up restricting these kids' diets as they can't eat anything carrying the label, which is another issue. Instead of using these on everything, instead every effort should be made to prevent cross-contamination, so that the label can be used less for the right reasons."

That said, Dr Koplin added that the call here is not for the label to be made mandatory as this would be a 'difficult and challenging' process, but instead for industry to improve practices and reduce cross-contamination.

"For example, there's an Allergen Bureau in Australia representing industry allergen management, and the group is trying to put manufacturing practices into place for the food industry so as to prevent cross-contamination," she said.

The project has found food allergies in children to be very common in Australia compared with many other countries, particularly in young infants below one year of age – some 10% of all young infants in Australia have a food allergy.

"We know that egg allergies are the most common type of food allergy in infants below 12 months of age, but by age 4 to 6, usually peanut and other tree nut allergies overtake these," Dr Koplin told FoodNavigator-Asia. "So many infants tend to grow out of the egg allergy, but we have found that few, maybe 20% or so, grow out of the peanut allergy, and it is likely this may follow them into adulthood. [We also recently discovered] that the introduction of peanut into a child's diet early on, before they turn 12 months old, has led to a 16% decrease in peanut allergy.

"This shows the importance of introducing the allergen before the child develops the allergy, to prevent it from even developing. However, much more research and data is needed for other types of allergens," said Dr Koplin.

The HealthNuts project has also found that children born in Australia to Asian parents, especially EastAsian parents, are particularly susceptible to developing food allergies. "The parents themselves have very low rates of allergy and disease, but children born to East Asian parents who were born in East Asia and then migrated to Australia were exceptionally high, some three times higher than other children," said Dr Koplin. "This phenomenon was not observed in other migrant children such as from the United Kingdom or Europe, and if the children were born in Asia but migrated over later in life, these high rates were not seen either.

"This has led us to believe that there is actually often a mismatch between the related genes and the Australian environment, such that when the child is born in Asia they have a certain protective factor preventing the development of food allergies, which is not present in Australia, leading to exceptionally high rates when they are born here."

The project is now trialling whether vitamin D supplementation in the first year of life is able to help prevent food allergies. Moving forward, Dr Koplin said that the team will also be following up on the progress of the study's original child recruits, the oldest of which are turning 15 and the youngest turning 10 this year.

"We have collected data from the 10-year-old subjects and will be analysing this over the next year, whereas funding is being sought to follow up on the 15-year-olds," she said. "The 15-year-old results will be interesting, as I really want to see the impact of adolescence on food allergies, what the reactions are like, whether there is increased risk of severe reactions and so on."