FOOD, NUTRITION & SAFETY MAGAZINE BULLETIN JAN 2022

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FOOD FORTIFICATION THE KEY FOR IMPROVING MATERNAL AND CHILD NUTRITION Ms. Prerana Patil

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EDITORIAL

Acting upon a request from India through Permanent Representative to the UN Ambassador Mr TS Tirumurti, adopted the resolution sponsored by India declaring 2023 as the International Year of Millets.

Indian Government had already declared the millets as Nutri-Cereals in April 2018.

We have a year to go in order to make some valuable progress so we can happily celebrate the next year as the International Year of Millets. We have many problems to overcome in order to truly achieve this.

Millets production is going down as farmers are finding it very difficult to grow them economically and find market easily. Although millets in market are more expensive than more popular cereals the farmers are not getting enough. If the millet consumption grows then markets will reach out to farmers.

Consumers would rather buy cheaper rice and wheat. So this is a Catch 22 situation or a vicious cycle that needs to be broken. How can we help?

One way is to create awareness of health benefits of millets. They are high in proteins so protein deficient Indian population should consume them. They are also high in dietary fibre so those with weight problems and diabetes would be benefited by millets. They are rich in minerals including iron and calcium.

They also are known to reduce cholesterol and inflammation. This would be useful in many ailments. As they are gluten-free, they would be



useful to those who are trying to avoid gluten.

INTERNATIONAL YEAR OF MILLETS, 2023

On the other side, they have some problems such as phytates and oxalates which reduce bioavailability of minerals. There are some other problems which could be avoided by proper cooking methods such as soaking and germination. This makes them more nutritious.

> Also consumers like tasty foods and so efforts should be made to make popular foods containing appreciable amounts of millets. Markets are showing many new products such as khakhra, noodles, cookies, pancakes, murukku and many other products that are quite acceptable to consumers.

Researchers could help industry and also home makers by devising easier and more effective methods of

eliminating the antinutritional components from

millets. This knowledge should not just remain in research journals but should be disseminated through various media including popular newspapers and magazines, social media pages as well as including in the school curriculum. Angan wadi and self-help groups can also spread the knowledge.

Health professionals including the doctors and nutritionists/dieticians can play a big role in helping here as people believe when they recommend some healthy foods.

PR/Amb T S Tirumarti O

Delighted that Indian Sponsored @UN resolution on "International Year of Millets 2023" was adopted by consensus in #UNGA this morning.

Big step to promote nutritional & ecological benefits of #millets to the as a key component of food basket & effect policy changes - 1/2



Arindam Baachi and 9 others





Prof Jagadish Pai, Executive Director, PFNDAI

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MICRONUTRIENT DEFICIENCIES M CHILDREN



Introduction

Nutrition plays an important role in health and disease as it contributes to promote, maintain and repair health. It is far more relevant in children, especially during period of rapid growth and development as during infancy and adolescence. Infancy is also a period when ideal eating habits need to be inculcated and adolescents have their unique diet issues. It is unfortunate that health professionals often neglect assessment of nutritional adequacy in their patients and hence parents remain ignorant about nutritional status of their children.

AUTHOR

Dr Yeshwant K Amdekar, Pediatrician, former Professor of Pediatrics, Former President, Indian Academy of Pediatrics

Concept of complete and balanced nutrition

Diet should contain macronutrients (cereals, pulses), micronutrients (vegetables and fruits), water and fibre (undigested carbohydrates) in adequate amounts.

Macronutrients - carbohydrates, proteins and fats - form the major source of energy and growth. For balanced intake of calories, carbohydrates should provideabout 60% of total calories, proteins 8-10% and fats 25-30%. Complex carbohydrates (brown rice, whole wheat, bajra, jowar, ragi) are better than simple sugars. Proteins from animal sources (dairy products, egg, meat, fish) are superior as compared to those from plant sources which don't provide all essential amino acids unless consumed from more than one source. Traditional combination of rice and dal is a

classical example. Polyunsaturated fats are ideal though body also needs small amount of saturated fat.

Micronutrients - various vitamins and minerals are available through vegetables and fruits. They form the part of protective foods. They protect the body from cell damage caused by free radicals, a biproduct of oxidative stress, thereby maintaining cell function and also boosting immunity.



Prevalence of malnutrition in children

In spite of improvement in health indices, significant malnutrition exists in children. It is evident by stunting and wasting in children under age of 5 years to the extent of about 30-40%. In addition, we face dual burden of malnutrition as obesity is also on the increase in urban as well as rural population. Thus, only 20-30% children are apparently healthy but many of them are also likely to suffer from micronutrient deficiencies. This is largely due to ignorance or negligence that promotes wrong eating habits including other aspects of lifestyle.





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While macronutrient deficiency is visible in terms of poor weight and loss of subcutaneous fat, micronutrient deficiencies often remain hidden but are widely prevalent across all socioeconomic groups.

Micronutrient deficiencies the hidden hunger!

Such deficiency is widely prevalent across all socioeconomic groups. It is not easy to pick up micronutrient deficiency, as symptoms are vague and non-specific such as feeling of tiredness, subtle behavioural change like irritability or lethargy or suboptimum school performance. Such symptoms are often ignored or attributed to factors other than nutrition. Health professionals may fail to identify early signs of micronutrient deficiency such as mild pallor (iron, B12, folate), lack of lustre or shining in eyes (vitamin A), beading of ribs (vitamin D, calcium), skin rash (zinc), redness of mouth (vitamin B), irritability (vitamin C) or poor cognition (iodine). Such subtle signs are often considered to be due to diseases other than micronutrient deficiencies.



Effective application of knowledge by health professionals

Health workers including doctors must function primarily as health promoters rather than disease managers. Assessment of nutritional adequacy and proper counselling to parents are the key factors to promote and sustain good health in children and it is possible during every visit, be it for immunisation or illness. Growth charts offer the best tool to monitor growth that indirectly measure macronutrient adequacy to a large extent. Growth charts for Indian children are available on IAP's (Indian Academy of Pediatrics) website for free downloading. These are userfriendly charts that can also help in evaluating BMI (Body mass index) and mid-parental height without



Deficiency of vitamin E or K, copper, selenium and other trace elements are not even suspected on physical examination. Besides vague need to calculate. Besides growth as a measure of physical increase in size, development is another parameter of health. Achievement of milestones at appropriate age ensures health of brain, other parts of

nervous and musculoskeletal system. However, well-grown and developed child may also have micro nutritional deficiency because of imbalanced diet.



Clinical judgment of micronutrient deficiency

Health professionals must focus on "at risk" group that includes infants with low birth weight (calcium, vitamin D and iron deficiency), fast growing infant on milk diet (vitamin D and iron deficiency), a child suffering from diarrhoea (zinc deficiency) or recurrent infections (multiple deficiencies), delayed healing (vitamin C) and undernourished child (multiple deficiencies). Many children are fussy about eating vegetables and fruits that leads to micronutrient deficiencies and so also children eating junk food. Recognising such "at risk" group, it is necessary to prescribe timely prophylactic supplements of micronutrients even without clinical evidence. However, presence of clinical signs justifiesspecific therapeutic supplements of iron, B12, folate, vitamin B complex, vitamin D, calcium and zinc as necessary. Iodised salt has reduced prevalence of iodine deficiency but 30% of the population may not consume iodised salt, in whom there is a risk of iodine deficiency that may present with thyroid enlargement and poor cognition. Hence, in general, health professionals must enquire about intake of vegetables, fruits, high-class proteins and iodised salt to judge probable need for micronutrient supplementation.





Health and nutrition education

Prophylactic and therapeutic supplements of micronutrients serve the purpose of short-term goal but it must be followed by proper education as a long-term strategy for prevention. Health professionals must take every opportunity to educate parents in a simple language, the contents of which should be accurate, brief and clear without scientific jargon. The message should be food diversity with emphasis on vegetables, fruits and high-class proteins. Vegetables and fruits come in different colours and nature has a purpose behind it in that child should consume every coloured vegetable and fruit at least once a week. It is a simple way of ensuring adequate intake of micronutrients.

While counselling about nutrition, one must consider family food habits as well as affordability, availability and accessibility of food. We must ensure adequate amount of macronutrient - cereals and pulses - without which, micronutrients are of no use. Thus, advice should be budget-centric and it is possible to suggest low-cost near ideal diet that ensures minimum daily requirement of nutrients. Preservation techniques such as soaking and decanting, germination and fermentation have been traditionally used to improve nutritional value of food. Ideal

eating habits and concept of hygiene must be inculcated in early childhood with participation from all family members. Outdoor physical exercisemust be encouraged and exposure to sunlight for half an hour around noon time ensures adequate intake of vitamin D.

Confounding factors

Besides ignorance, there are other factors responsible for imbalanced nutrition. Poverty, frequent infections due to unhygienic conditions, poor sanitation and contaminated water sources, spending on non-nutritious food and lack of access to health and nutrition education contribute to nutritional deficiencies in low socioeconomic group while wrong choice of food in spite of knowledge along with sedentary lifestyle is the cause of obesity with micronutrient



deficiencies in affordable population. It is ironical that majority children suffer from various micro nutritional deficiencies irrespective of economic and educational status of parents. Climate change may result in suboptimum quality of nutritional elements in the crop and may add to the problem. Lack of political will and commitment from health professionals are equally responsible.

Way forward

Problem of micronutrient deficiency needs to be addressed jointly by all stake-holders. Food-based strategy



includes increased production of quality food, efficient distribution channels and equitable consumption. Community empowerment and equity to provide access to health and nutrition educational services are necessary. Iodised salt has improved iodine status of the community though nearly 30% population cannot afford iodised salt. Hence there has to be social protection for the disadvantaged population. Government of India has announced the project of fortification of rice, an item that is consumed by the most in the country.

However, fortification has limitations and challenges in that it can take care of a single micronutrient and not everyone can afford it. Further research by nutritionists with the help of industry can make a difference. Industry could look at the possibility of multi-micronutrient powder that can be mixed with any of the food items, similar to Sprinkles but it should be affordable. Finally, health professionals must educate the community regarding importance of nutrition in health and disease. Short and simple messages in different languages aired on the radio or television and spread through print media as well as WhatsApp would help to reach the majority. Time has come for all of us to tackle the issue of nutrition on a war footing.

IF A **REGULATION** IS NOT MONITORED FOR OUTCOME, IT HAS NO PURPOSE



A standard is the starting point of a monitoring system for the simple reason that it comes into existence to correct a failure or fraudulent practice raised by the system. Every standard made should automatically enter and get measured by the same system for its impact on eliminating or mitigating a prevailing risk. This way, evidence of any defect or failure is available with the regulator all the time. A standard that does not fulfill its intended purpose should be reviewed, amended, or removed. And if such a system is not existing or functioning or is not likely to be installed (already a delay of 10 years), standards made should be recognized as an unnecessary burden on the food industry. The practice of appearing to solve without intent to solve should be raised and questioned. Regulated industry deserves to know why and for what purpose a standard is made and how it has contributed to safe and wholesomeness of foods. There is no expectation of a perfect regulation being put out, there can only be regulations made in response to compelling evidence, but that ad hoc regulations or

AUTHOR Dr Joseph I Lewis, Chairman, Regulatory Affairs, PFNDAI

> standards require no monitoring, no assessment, and no refinement, is hardly an acceptable form of governance.

In current times notifications are like "orders" to Food Safety Officers (FSO) operating in 36 States and Union Territories. Issuing regulation or standards is not a singular action or event. When regulations become an integral part of surveillance, monitoring and evaluation (SME) process, its implementation is monitored for signals of its impact on the existing defect level. Surveillance is an ongoing systematic collection, collation, analysis, and interpretation of data (including the signal), followed by dissemination of this information to all stakeholders. It is the data that decides whether a new measure is required or not. Every defect encountered does not deserve a standard. A measure could be a simple requirement of capacity or capability building or a specific intervention in good manufacturing practice. The measure (i.e., standard or regulation) adopted "shall be proportionate and no more

restrictive of trade than is required to achieve appropriate level of health protection, regard being had to technical and economic feasibility and other factors regarded as reasonable and proper in the matter under consideration" [Sec 18(1)(d)]. When the data suggests a standard and it is notified it sets into motion the process of SME. Standards that fail to mitigate the failure are to be replaced or removed as a simple matter of good housekeeping. Otherwise, left unattended, standards have an uncanny ability of longevity or co-existing with its synonymous entrant (principal display panel and front of pack is an example).

It takes up to 3 years and more for a regulation to find its final form, after several rounds of discussions and drafting. FSO's and FBO's are expected to implement it within 6-12 months of being notified. When data to support or abort a proposed standard is absent, and there is no mechanism to measure its value, how are its implementation and impact measured? The recent use of the term "regulatory compliance' by the Authority, raises interesting avenues of hope, if its intent is to enhance or assist the FBO's in being "compliance ready" ahead of enforcement. The meaning here is to work with FBO' on the necessary requirements, instead of raising demands or taking coercive action.

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	COMPETENCY B.2.1	MONITORING	PROGRAMMES IN	N RELATION TO THE	FOOD CHAIN
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OVERALL OUTCOME	The national monitoring programme informs CAs on the situation for specific food safety or quality issues, supports trends analysis and risk assessment and contributes to improve targeting of interventions with a risk-based approach.
B.2.1.1	A monitoring plan is in place to detect and/or monitor issues related to food safety or quality in the food chain.
B.2.1.2	The risk ranking processes drive the development of the national food safety and quality monitoring programme.
B.2.1.3	All relevant CAs have collaborated to facilitate the planning, ongoing implementation, operation and analysis of the national monitoring programme.
B.2.1.4	The national monitoring programme is informed by an FBO risk categorization framework.
B.2.1.5	The national monitoring programme takes into consideration available human, financial and analytical resources.
B.2.1.6	The outputs of the national monitoring programme are used to review/inform food control policies and strategies and to propose suitable interventions/measures.
B.2.1.7	A mechanism to rapidly inform the other CAs responsible for FBD surveillance and response is in place when a monitoring plan detects a potential risk to human health in the food chain.

Under a "compliance monitoring" period, State FDAs should be encouraged to report field issues arising from each regulation analyzed by sector, food category and food product. High spots of noncompliance would clearly indicate unreadiness or difficulties with the requirement. There is a case here that regulations and standards are in fact relief measures that FBO's seek to overcome the differing interpretations on the ground. What is also clear is that both stakeholders, Industry and the Authority come to the table to discuss relief from unintended field actions. Front line officers are inclined to take decisions if the regulatory scope and intent is not clear to them.

For example, admonishing FSO's on unwarranted actions of selectively stopping transporters of frozen/chilled foods on the ostensible notion that they would spread Covid-19, is a manifestation of the lack of information and training. The Authority also pulled up licensing authorities for raising queries in a piecemeal manner and/or asking for submission of unnecessary documents. Such instances are addressed through more orders, directions, or letters, adding further to the increasing pile of regulations that FBO's must constantly be aware of to successfully conduct business. These actions are ad hoc and not procedural enough to provide confidence with business operators. Issuing more paper is not the solution or substitute for process and procedure. In the absence of compliance monitoring the Authority, perpetuates another kind of process of seeking never ending relief from everlasting problems.

More seriously, the Authority's time is diverted by these operational issues.

instead of attending to more critical issues in consumer safety, policy, reform, alignments in trade and weeding out unnecessary regulations. Only when regulatory control is defined as a process that puts all measures under



Compliance monitoring reveals whether the majority of FBO's are in complying mode and

who the undisciplined few are. Inspection activity and conformance to standards (moisture, solids nonfat, etc.) have little or no emphasis on safety, yet they form the overwhelming engagement of laboratories. Even though these are not safety parameters, sensationalizing their failure casts aspersions on the regulatory system and industry. A50-month data [Delhi FDA; GNCT] collated from a compliance monitoring model shows that general compliance is around 89% of 7400 market samples analyzed between 2011-2015 (Fig.1).





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Failures are grouped under broad terms such as misbranding, substandard, unsafe and violation. Under the SME process these failures would be analysed for reasons, which may be several. If adopted by FDA's throughout the country – and with minor add-ons – a national map of food failures by state, sector, product category and the failing standard would be available on an ongoing basis. Only when the defect reaches a predetermined threshold value (risk assessment) would a standard be

PROTEIN FOODS AND NUTRITION DEVELOPMENT ASSOCIATION OF INDIA

considered. All stakeholders could be consulted on this data prior to making a standard or regulation; there is evidence, frequency and severity of failure. For example in a particular year (2015) 50% of 19 substandard failures in milk. 9 were due to solids nonfat (SNF). Values of SNF for four samples of full cream milk tested from 8.59 - 8.76 (specification is not less than 9); whereas other samples of standard, toned and mixed milk ranged from 8.16-8.24 and one sample was 7.16 (specification is not less than 8.5). In both instances. the data sets show the values are about 0.5% below the set limit. What are the underlying reasons for the failure?

All failures are not necessarily from product, the possibility of faulty



analysis, interpretation errors or overstepping the compliance requirement should fall under the scope of "evaluating reasons for the failure". The Authority website is mostly about law, more regulations, and more inspection notifications, rarely is the information on compliance monitoring or weeding out ineffective and redundant standards. Moving to minimum effective regulations should be the goal.



COMING EVENIS

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VITAL VITAMIN WITH PROVEN BENEFITS IN BONE AND HEART HEALTH

AUTHOR

Bone health

Bone is a dynamic organ that performs mechanical and homeostatic functions and undergoes a continuous selfregeneration process. Bones are into a continuous changing process of formation of new bone and break down of older ones. At the younger age, the process of formation of new bone is faster than break down of older bone, and thus, the bone mass increases. The peak bone mass is achieved at an age around 30. Later, bone remodelling continues, but the loss of bone mass is slightly more than gain in bone mass. Higher the "peak" bone mass one acquires, (peak < 30 years) the more one can lose before developing osteoporosis.



Nearly 200 million people are estimated to have osteo-porosis worldwide. In India more than 61 million people suffer from osteoporosis. India stands highest globally in terms of prevalence of osteopenia. Several factors such as low calcium diet, low nutritional diet and physical activity, tobacco and alcohol abuse, age, hormonal

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> levels, use of medication as corticosteroid, cortisone, prednisolone, play a significant role in deteriorating the bone health.

65% of bone is made of calcium; therefore, consumption of food rich in calcium (including milk) becomes essential for healthy bones. Bones grow rapidly during childhood and adolescence. and therefore adequate calcium is needed to build strong bones. Bone calcium begins to decrease in young adulthood and gradual loss of the bone density occur with increasing age. If people are not getting enough calcium in their diet, the body absorbs calcium from the bones to ensure normal cell function, leading to weakened bones. Therefore, calcium is needed both in childhood and adulthood.

Heart Health

Cardiovascular disease (CVD) involves atherosclerotic vascular diseases like coronary heart disease





(CHD), cerebro-vascular disease (CBVD), and peripheral arterial diseases. In recent years, demographics and health surveys have reported increasing incidence of CVD among all socioeconomic strata.

CVD is considered as the leading cause of death globally. Major CVD related deaths, nearly 80%, are reported from low and middleincome countries like India. According to WHO, CVD and stroke are the leading causes of death in the worldwide and also in India. The well recognized aetiological risk factors leading to the onset of CVDs include hyperlipidaemia, hypertension, diabetes, obesity, smoking and, lack of physical activity. Coronary artery calcium score, lipoprotein, apolipoproteins, homocysteine, thrombosis markers like fibrinogen, and plasminogen activator inhibitor, carotid intima-media thickness, genotypic variations, non-alcoholic fatty liver disease, C-reactive protein, platelets, and birth weight levels are the most common emerging cardiovascular risk factors. Vitamin K2-7: The Vital Vitamin with Prover Benefits in Bone and Heart Health



Vascular calcification and arterial stiffness

Arterial stiffening and vascular calcification are emerging as markers of vascular aging and cardiovascular disease risk. Arterial stiffening predicts cardiovascular events, including left ventricular hypertrophy, myocardial infarction, hypertension, atherosclerosis and stroke, as well as cardiovascular complications in diabetic mellitus and chronic kidney disease (CKD).

Vascular smooth muscle cells (VSMC) undergo osteogenic differentiatio n and mineralizatio n in response to a variety of stimuli leading to

vascular calcification. The remodelling of extracellular matrix promotes VSMC calcification, which accelerates vascular stiffening. Arterial calcification is of two categories: medial and intimal arterial calcification. Medial arterial calcification exists in aging arteries in patients with diabetes mellitus and CKD, which often occurs independent of atherosclerosis. Intimal arterial calcification occurs mostly in patients with atherosclerosis, but also is found in patients with diabetes mellitus and CKD.



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Osteoporosis and vascular calcification are conditions which frequently co-exists in aging population thus both are considered the major health concern. A close link exist between bone and vascular health. Several

studies have shown an association between loss of bone mineral density and development and progression of aortic calcification and also with higher mortality related to cardiovascular disease.

A single solution targeting both the issues will be highly beneficial. Vitamin K2-7 is a solution to combat this combined jeopardy.

Vitamin K2-7: Promising role in bone and heart health

Vitamin K2-7, also known as Menaquinone-7 is the most innovative vitamin of its kind. It is a new ingredient of recent times addressing various lifestyle related issues including bone and heart

health. Due to the expanding science and recognition, Vitamin K2 is getting increasingly accepted for its role in Bone and Heart Health.

Vitamin K2 deficiency is a common problem worldwide. Vitamin K2 insufficiency has shown direct association with an increased risk for cardiovascular disease and osteoporosis. A community-based study was conducted in 452 community-dwelling men and women (age range 60-80 y) who were generally in good health and free from clinical cardiovascular disease and kidney, liver disease or osteoporosis. The study showed 97% subjects had notable measures of ucMGP and coronary artery calcium at baseline indicating vitamin K deficiency in subjects. (Shea et al. 2011) A study analysing

the vitamin K2 status in Indian population showed that the sample of healthy individuals and Type 2 diabetes patients had low (insufficient) levels of vitamin K2 (menaquinone-7) indicating low serum levels of MK-7 as well as low levels in the typical diet. (Vaidya et al. 2021) Increasing the intake of vitamin K2 in the general population, will provide substantial benefits to individuals in terms of bone and cardiovascular health.

Vitamin K2-7 breaks the jeopardy of calcium paradox

The central issue is better utilization and metabolism of calcium. Unfortunately, we are experiencing a "Calcium Paradox" wherein calcium is not getting effectively deposited in the bones but getting increasingly deposited in the arteries, thus leading to chronic disorders such as osteoporosis and cardiovascular diseases (due to arterial calcification). Vitamin K2-7 helps address this double jeopardy situation and helps in the deposition of calcium in the bones and inhibition of calcium deposition in the arteries.



Vitamin K2-7 increases calcium utilization

Calcium supplements produce a 1% increase in bone density in the first year of use, without further increase subsequently therefore increasing the utilization of calcium is more important than increase calcium intake. Absorption of calcium decreases to 15%–20% in adulthood and continues to decrease as people age. Humans absorbs only about 30% of the calcium in foods.



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Vitamin K2-7: The Vital Vitamin with Proven Benefits PROTEIN FOODS AND NUTRITION DEVELOPMENT ASSOCIATION OF INDIA in Bone and Heart Health

When considering total calcium intakes, calcium inadequacy remains a concern for different age groups.Calcium inadequacy exists due to poor absorption of calcium;therefore, it is essential to increase the absorption and better utilization of calcium. the arteries thus promoting bone and heart health.

Benefits of vitamin K2-7 in bone and heart health: Clinically Proven

A placebo controlled double blind study conducted in healthy post-



Osteocalcin is a vitamin Kdependent bone protein synthesized by Osteoblasts which provides the bone matrix upon which calcium crystallizes. Osteocalcin holds calcium in the bone and provides structure and order to bone tissue; without which bone would be fragile and easily broken. Matrix GLA protein (MGP) is a calcificationinhibitor, which prevents calcium deposit in the arteries.

Osteocalcin and MGP both are dependent on vitamin K for their activation. Vitamin K "activates" osteocalcin and MGP through a process called "carboxylation". Uncarboxylated osteocalcin (ucOC) and un-carboxylated MGP cannot adequately absorb calcium in the bones and inhibit calcium build up in the arteries respectively until effectively carboxylated. They rely on vitamin K for its activation by a process of gamma carboxylation. Vitamin K2 is effective in the carboxylation of these proteins.

Vitamin K2-7 improves the utilization of calcium in bones and prevents calcium deposit in

menopausal (age: 55-75 years) women showed no loss of bone strength at high K2 intake at a dose of 45mg/d. (Knapen et al. 2007) A randomized placebo-controlled double-blinded clinical trial was conducted in 142 postmenopausal women with osteopenia. One year supplementation with vitamin K2 (375µgMK-7/day) along with vitamin D3 (38 g/day) and calcium (800 mg/day) resulted in decease in under-carboxylated osteocalcin in MK-7 group (- $65.2 \pm 23.5\%$) compared with the placebo group (-0.03 ± 38.5%; p< 0.01) after 1 year. (Ronn et al.

year.(<u>R</u>

2021) A 12-months randomized controlled single blind trialconducted in community-dwelling men and postmenopausal women showed a significant decrease in bone loss of femoral neck at a dose of 90µg of vitamin K2 and 90µg vitamin K2 along with Calcium



and vitamin D3 in postmenopausal women (p = 0.006) compared with placebo, with no effect observed in men. However, addition of calcium and vitamin D3 to vitamin K2 showed no additional effect on bone loss. Serum biomarkers cOC/ucOC ratio increased in the participants receiving vitamin K2 or combination of vitamin K2, calcium and vitamin D3.(Zhang et al. 2020)

The Rotterdam study was a landmark study conducted to examine the association of dietary intake of phylloquinone (Vitamin K1) and menaquinone (Vitamin K2) with incidence of coronary heart disease (CHD). The study included 4807 men and women aged 55 years and older with no history of myocardial infarction who were followed-up for 10 years. The relative risk of CHD mortality was reduced with dietary intake of menaquinone. Intake of menaquinone was also inversely related to all-cause mortality and severe aortic calcification. However. phylloquinone intake was not related to any of the outcomes suggesting that an adequate intake of menaquinone could prevent CHD.(Geleijnse et al. 2004)



PFNDAI Jan 2022



A prospective, community-based cohort study evaluated the role of vitamin K in the regulation of vascular calcification by evaluating the associations between intake of vitamin K and incident (new onset) CHD among 2987 Norwegian men and women, aged 46-49 years. Lower risk of CHD was associated with higher intake of energyadjusted vitamin K2 (p=0.03). No association between intake of vitamin K1 and CHD (p=0.64) was observed. The study concluded that a higher intake of vitamin K2 was associated with lower risk of CHD.(Haugsgjerd et al. 2020)



A randomized placebo-controlled clinical trial analysing the effect of vitamin K supplementation in vitamin K-insufficient subjects (n: 243; aged: 40-70 years) suggested that vitamin MK-7 induces a significant decrease of both desphospho-uncarboxylated Matrix Gla-Protein (dp-ucMGP) and carotid-femoral pulse-wave velocity (cfPWV). (Vermeer et al. 2020) Another prospective cohort study analysing the relationship between phylloquinone and menaquinones intake and risk of Peripheral arterial

disease (PAD) reported an association between menaquinone intake and reduced risk of PAD. Participants reported less events of CVD with high intake of menaguinone. In larger number of hypertensive patients, menaquinone intake was significantly

associated with lower risk of PAD (p=0.005). High intake of phylloquinone was not associated with a reduced risk of PAD. (Vessers et al. 2016)

Synergia Life Sciences has patents for cardio-protective effect of vitamin K2-7 by balancing sympathovagal tone (Patent No. W02012/059942) and for role of vitamin K2-7 in facilitating the maintenance of cardiovascular fitness (Patent No. WO2010/103545).(Patent 2009), (Patent 2010) Vitamin K2-7 exerts cardio-protective effect by shortening of QT and QRS interval and prolongation of RR interval. Sudden cardiac death and myocardial infarction are a result of autonomic dysfunction. It restores sympathovagal balance. In clinical practice guidelines on Postmeno-pausal Osteoporosis, it has been recommend ed by Dr. **Dilip** Mehta from Synergia 30% Life Sciences that postmenopausal women with 44% osteoporosis need to be supplemented with vitamin K2-

Vitamin K2-7: The Vital Vitamin with Proven Benefits in Bone and Heart Health

7 along with the recommended intake of calcium, magnesium, vitamin D and a balanced diet.(Meeta et al. 2010)

Emerging trends in dietary supplements market targeting improved bone and heart-health

The rising number of lifestyle diseases such as obesity, arthritis, osteoporosis, blood pressure, cardiovascular diseases, diabetes, malnutrition, etc has increased consumers awareness towards preventive healthcare. Consumption of dietary supplements bridge the nutritional gap in the body and prevents diseases and other lifestyle related problems. Consumers are now increasingly shifting towards preventive healthcare supplements.

Growing prevalence of heart diseases and bone related disabilities has led to innovate effective heart and bone health supplements. A significantly high demand for heart health supplement products exist as they are effective in reducing risks related to cardiovascular diseases. A high consumption of supplements related to bone and joint health has been observed, majorly in geriatric population and young adults.



Vitamin K2-7: The Vital Vitamin with Proven Benefits PROTEIN FOODS AND NUTRITION DEVELOPMENT ASSOCIATION OF INDIA in Bone and Heart Health

Vitamins and minerals based dietary supplements are expected to register a healthy CAGR of 7.6% during the forecast period. They are expected to be the most attractive segment in the global bone and joint health supplements market over the forecast period. Global heart health supplement market has CAGR of 4.5% for year 2020-2030 according to persistent market research.



Vitamin K2 deficiency is increasing worldwide which is anticipated to be a primary trigger for demand in the global market. The Global Vitamin K2 Market size is expected to grow at a CAGR of 7.1% during the forecast period (2021-2028). The driving factors for the growth will be increasing demand for healthy food and supplements, growing prevalence of cardiovascular diseases and osteoporosis, increase in geriatric population globally.

Indian dietary supplement market trend

Factors such as changes in eating habits, absence of physical activity and rising sedentary lifestyles have increased the incidence of various lifestyle diseases



such as diabetes, blood pressure, obesity, cardiovascular problems, etc. However, a changing trend in the lifestyle and rise in health consciousness has been observed in Indian population, which has developed a keen interest towards healthcare dietary supplements with a focus on preventing life-style related disorder. With consumers unable to fulfil their nutritional requirements through their regular diets, they are now recognizing the importance of nutritional supplements to fulfil their nutritional gaps.

Rapid digitization, increase in social media usage, changing lifestyles, rising health consciousness, rapid growth of the e-commerce market and rising per capita income are the key drivers in the growth of the dietary supplements market in India. The Indian dietary supplements market has shown strong growth during 2015-2020. The dietary supplements market in India is expected to grow CAGR of ~20% from 2015 to 2023. Vitamins and minerals occupies a larger share in the Indian dietary supplements market by nearly 40%.

Dietary supplement market is an ever-growing sector, which is further exhibiting a growing trend due to changing life-style and increasing awareness towards maintaining health for improved quality of life. Vitamins and mineral supplements holds a larger share in the dietary supplement market which drives the demand for dietary supplements further. Growing burden of cardiovascular diseases and osteoporosis has increased the demand for vitamin K2 supplements, which play a significantly role in promoting cardiovascular and bone health.



Vitamin K2-7 supplement could be recommended as a natural bioactive compound potentially able to prevent and/or treat metabolic bone and vascular disease such as osteoporosis and vascular calcification.



PREBIOTIC FIBER INTAKE TO SUPPORT WOMEN'S HEALTH





Importance of Women's Health

Women play a key role in upholding the health of their families. They become mothers; take up the primary responsibility as the caregiver to their children, which greatly influence the overall household health. Across her lifespan, a woman's health status matters to herself, her family hence, for a woman to be in the pink of her health is essential. Various parameters such as fluctuations of hormones across the lifespan can affect clinical outcomes: the loss of female hormones (estrogen) contributes to loss of bone mineral density, which may lead to osteoporosis, increased risk of fracture, and increased morbidity and mortality.

Role of Prebiotic Fibres

According to the International Scientific Association for Probiotics and Prebiotics (ISAPP) 2016, prebiotics are substrates that are selectively utilized by host microorganisms conferring a health benefit. The live microorganisms when administered in adequate

amounts, and confer a health benefit on the host are the probiotics (the good or beneficial bacteria). The



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probiotics are essential for the human health as they produce metabolites and molecules such as short chain fatty acids (SCFAs), vitamins (inside human gut), stimulates the immunological defence system of the host and may reduce the potential risk of infection. Most well-known examples of probiotics are the members of genera Bifidobacteria and Lactobacilli. Probiotics are also taken as supplements in cases of inadequacies. Most importantly, the

prebiotic fibres are the food for these probiotics. (Roberfroid et al., 2010).Consumption of prebiotics fibres help beneficial bacteria/probiotics to proliferate in the host gut for their well-being. Prebiotics are the nondigestible oligo-saccharides, which selectively stimulate the growth of beneficial gut microbiota such as lactobacillus and bifidobacteria, of which several species are known potent probiotics. Extensive researches on pre- and probiotics have been carried out demonstrating their health benefits. This document speaks about how prebiotics can be helpful in maintaining health of women



Figure 1: Polymer length of sugar, FOS and Inulin

It is known that human intestine is home to a complex ecosystem of microorganisms. Relation between the intestinal bacteria and their host is mostly mutual and both of them evolve together. As discussed above, beneficial intestinal bacteria have a number of important functions such as producing various nutrients, preventing infections caused by intestinal pathogens, and modifying immunological responses in the host. Hence, maintaining a balanced/healthy microbial population in the gut for the improved health condition of the host is important. One such prebiotic fibre belong to a fibrefamily know as inulin-type fructans (ITF like short-chain fructooligosaccharide (sc-FOS)). Other fibres of this family are Inulin and oligo-fructose (OF) (Fig. 1). These prebiotics escape the digestion in the upper-gastrointestinal tract and gets fermented after reaching the proximal colon of the lower intestine and then throughout the colon.

Prebiotic fibre helps in proliferation of beneficial gut microbes, which in turn, helps in the production of SCFAs like acetate, propionate and butyrate production that are beneficial to the host in various bodily functions and immunomodulation. The introduction of prebiotics, probiotics, or synbiotics¹ into human nutrition as food ingredients is desirable for the intestinal microbiota. These can be introduced through raw vegetables and fruit, fermented pickles, or dairy products. These can also be consumed as supplements such as functional food or pharmaceutical formulas.

Supporting Women's Health

Effect on Mineral Absorption Insufficient intake of nutrient and aging among women may show serious consequences on health, like in pregnancy, immune function, bone related problem and neurological functions. The causes leading to bone mass loss may be many, but the most common cause is aging. Skeletal aging is understood to occur at high rate in women compared to men because





of the hormonal alterations post menopause; hence, it is essential and critical to support mineral absorption.

In a double-blind, randomized cross-over study among 59 young girls (11 - 14 years), an intake of 8g/d prebiotic fibres (oligofructose or inulin or combination) from chicory root for 3 weeks each, along with calcium supplement (in juice), the calcium absorption was significantly increased with the intake of prebiotic fibre combination. Another similar study among 25 young girls (10 – 15 years), the prebiotic fibre combination intervention for 3 weeks suggested that overall significantly higher calcium absorption percentage.

When post-menopausal women were administered 10g/d of sc-FOS for 5 weeks, there was significantly enhanced copper absorption (p=0.042) (Ducros et al., 2005). In another similar study, the intake of sc-FOS (10g/d) for 5 weeks, there was increased Mg absorption, particularly in women with dietary magnesium inadequacy. Among late menopausal women (menopause >6years), the calcium absorption was improved, suggesting that scFOS may influence calcium absorption in the late postmenopausal phase (>6y). With prebiotic fibre intake (inulin+OF) (10g/d) for 6 weeks, the true fractional Ca absorption, measuredby dual isotopes before and after treatment, was significantly increased (+7%)

¹Synbiotics refer to food ingredients or dietary supplements combining probiotics and prebiotics in a form of synergism



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in post-menopausal women with lower initial bone mineral density (Holloway et al., 2007).

As discussed above, SCFA and other organic acids that contribute to decrease the colonic pH, in turn, cause a modification of calcium or other minerals so that its passive diffusion may be enhanced. SCFA are also likely to contribute directly to the enhancement of calcium absorption via a cation exchange mechanism (increased exchange of cellular H⁺ for luminal Ca²⁺. ITF have been found to increase Mg absorption, nevertheless available data are very limited. These fibres are able to improve calcium absorption in human, based on their physiological status (early postmenopausal women are unaffected) (Roberfroid et al., 2010).

Effect on Constipation during Pregnancy

During pregnancy, one of the common problems faced by women is constipation and decreasing the quality of life for them.FOS is a non-digestible dietary fibre. Intake of dietary fibre has been indicated to support healthy bowel movements, including during pregnancy. Reports have shown improved stool consistency (hard stool decreased by 11–14%, normal stool increased by 5–10%, and loose stool increased by 0–6%). Intake of 8g/d prebiotic fibre (FOS) in late gestation (from 26th week of gestation to one month after delivery), reported improvement in stool frequency two weeks after the intervention (1.0 vs. 0.8 times/day), suggesting a potential constipation alleviation effect.

Effect on Gut Health

Prebiotic effect of FOS intervention among pregnant women has been reported. Significantly increased number of fecal Bifidobacterium spp. and *Bifidobacterium longum*(beneficial bacteria) in the FOS group was reported at 36 weeks of gestation. FOS can selectively stimulate the growth of bifidobacteria which is associated with health benefits such as SCFA production, influences host nutrition, provides a natural defence mechanism against invading pathogenic bacteria. Bifidobacteria is also one of the probiotics hence bifidogenic effect of FOS is considered as positive effect of the host health.

In Summary

Probiotic organisms are crucial for maintaining the balance of human intestinal microbiota. Prebiotics being the food for these probiotics

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thus becomes of utmost importance. Science confirms positive effects of prebiotics in the women's health. In several studies, prebiotic fibres confer a beneficial effect on women health especially from the perspective of mineral absorption. Role of prebiotics is promising and food products containing prebiotics such as FOS may play a vital role in improving mineral absorption in women who are the backbones of every family.

Suggested Reading

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POST-CONSUMER RECYCLED PLASTIC: AN ANALYSIS

AUTHOR Dr Joseph I Lewis, Chairman, Regulatory Affairs, PFNDAI

• Post-consumer recycled plastic often referred to as PCR, is plastic made from consumer waste after collection, sorting, cleaning, and reprocessing. When recycling is efficient, it can be a safe and effective way of maximising the resource value of the plastic and reducing waste and the hazardous effects of litter.

• The Authority in 2018, very rightly, unpacked the Packaging and Labelling regulation [FSS(PL)2011] and notified three separate regulations dealing with packaging, labelling and claims. There is now much more attention and focus given to packaging materials, their safety when in contact with food and more recently to concerns on reducing post-consumer waste.

Since then, several other initiatives have come into effect, signalling the coming together of an urgent need to put in place a "ways and means" mechanism to address these concerns.

• For example, the remit of the Ministry of Environment and Forests is now expanded to include Climate Change (MoEFCC), the ultimate goal for all measures of containing, if not eliminating wasteful practice. The Plastics Waste Management Rules 2016 and the Extended Producer Responsibility (EPR) notifications followed, fairly quickly. Taken together, these rules place obligations and responsibilities with regard to waste generation, collection, segregation, and recycle processes, to create a sustainable ecosystem. Meanwhile, packaging producers and users in particular from the food industry are now in a position to play their part in addressing concerns on postconsumer plastic waste, and this perhaps is the most critical step to a circular economy. This means materials are constantly in flow around a 'closed loop' system, which ends the 'one use and



discard' concept of plastic use. It signals the new way of designing ecosystems

• At a webinar organized by PFNDAI on "Food safety and efficacy of recycled plastics for food contact packaging" Mr Maurice Simenon and Mr Gert Coun from SABIC specialists in producer technologies, explained the processing routes (Fig.1) for converting post-consumer plastics into food grade reusable material.



Figure 1 Overview of processing routes for mechanical and chemical (pyrolysis) recycling



FNDAL DEVELOPMENT ASSOCIATION OF INDIA



Hindustan Unilever Limited

Webinar on "Food Safety and Efficacy of Recycled Plastics for Food Contact Packaging"

Mr Ashok Pralhad

Sustainability Director, Coca Cola



Dr Tony Taylor Unilever Global Reg. Affairs Leader Pckg & Sustainability, Unilever, UK

Dr Srivats Mohan

Packaging Materials spc. Unilever Foods Innovation Centre, The Netherlands

Mr Gert Coun

Sr. Manager Market Dev. & Innovation Mgt. Polyolefines Petrochemicals, Europe SABIC Mr Maurice Simenon Specialist, Regulatory Affairs, Global Product Stewardship SABIC

• While several technologies exist by which plastic packaging can be recycled, each has its own benefits and challenges with the presence and/or removal of contaminant residues in post-consumer material being a key consideration. Plastic waste can be processed mechanically (sorting, cutting, washing/cleaning, melting) to produce recycled material or it can be broken down to monomers and oligomers by a chemical process, purified and then used to make new plastic (advanced or chemical recycling). The critical criteria here is that either process must demonstrate its capability to remove potential contaminants to a level not likely to pose a risk to human health.





Dr Srivats Monan Packaging Materials Specialist Unilever Foods Innovation Centre, The Netherlands Post-consumer Recycled Plastic: An Analysis

Coca Cola gave examples of recycled plastic safely used in food contact application from different markets and explained that in the production process, chemical and/or mechanical, feedstock composition is to be carefully managed to ensure safety for foodcontact use. Dr Tony Taylor, Unilever Global Regulatory Affairs, provided an overview of regulatory authorities worldwide [Fig.2] approving use of recycled plastics in contact with food on the basis of reliable technology processes, risk assessments and compliance with prescribed requirements. India too uses these regulatory principles and procedures.

• Manufacturers of food packages made from recycled plastic hold responsibility for ensuring that, like virgin material, recycled material is of suitable purity for its intended

Figure 2: Regulatory overview of markets where PCR plastic in contact with food can be used when safety requirements are met (estimate circa 2021)

• Manufacturers and packers of food and beverage products, being immediate users of recycled plastic are primarily concerned with safety of materials in contact with food and ensure that they meet the strict regulatory requirements of food grade plastic notified by regulators in different countries. Dr. Srivats Mohan, Packaging Materials Specialist Unilever, and Mr Ashok Pralhad, Sustainability Director,







Prof R N Jagtap, Professor – Dept. of Polymer & Surface Engineering, Institute of Chemical Technology; Ms Himanshi Mahajan, Packaging Development Lead- R&D Mother Dairy and Mr Jikul Purohit, Co-Founder Packfora LLP. Several issues were raised and discussed on safety, alternate recycling technologies, regulatory aspects, including motivating consumers to contribute their share in sustaining the environment.

• This article by the author is about a summing up what we heard, discussed and understood. The webinar addressed the general concern of harming the environment with specific focus on mitigating measures through use of recycled plastic. While governments determine policy directions, its translation to action involves many things, ministries, authorities, industry sectors and more importantly fulfilment of assigned responsibilities by identified entities in supply chains, in this case the packaged food industry.

use and is compliant with specifications set for the virgin material. The effectiveness of the recycling processes in removing chemical contamination is evaluated by maximum levels prescribed by challenge test(s). Use of recycled plastic and their compliance requirements are available for several countries, EU, US, and Japan. Reference was made to US FDA guidelines on the points to be considered by the manufacturer for making a proper evaluation of the producers process of recycling for food contact use. The European Commission provides a regulation for recycled materials and articles intended to come into contact with foods. Readers may reference these for more information.

Global Product Stewardship

SABIC

• The four talks was followed by an engaging discussion with a panel comprising Dr KSMS Raghavarao, Professor of Chem Engg., IIT Tirupati, Director, CSIR-CFTRI;



Prof R N Jagtap Prof. Dept. of Polymer & Surface



Mr Jikul Purohit

Co-founder, Packfora LLP



Dr Joseph Lewis Chairman, Regulatory Affairs, PFNDAI

Ms Dolly Soni Convener, Webinar Executive - Marketing & Digital, PFNDAI





Post-consumer Recycled Plastic: An Analysis



Dr Tony Taylor Moderator

Unilever Global Reg. Affairs Leader Pckg & Sustainability, Unilever, UK

Dr Jagadish Pai Executive Director, PFNDAI





Dr KSMS Raghavarao Prof. Chemical Engg, IIT Tirupati, Ex -Director, CFTR!

Ms Himanshi Mahajan Pckg. Dev. Lead – R&D, Mother Dairy



• MoEFCC has set the forward path towards use of plastic waste by its Plastic Waste Management (PMW 2016) rules, relating to segregation, storage and its handover to local bodies or authorized agencies. This part of the waste management chain includes retailers and street vendors to manage their waste and reduce litter and random disposals. There is another obligation through the Extended Producer Responsibility (EPR) cast on Producer, Importer, Brand Owner for collection and recycling, applicable to both preconsumer (industrial) and post-



consumer packaging waste.

• The Food Safety and Standards Act (FSSA, 2006) under its risk framework, is in alignment with global practice and is well capable of determining the measures required for use of recycled packaging where materials come in contact with food. The Authority (FSSAI), through the Scientific Panel will provide a scientific risk assessment of the material and processes using post-consumer waste prior to the Authority setting up conditions and compliance requirements.

• Recycled plastic reduces the need for more virgin plastic and is the best way of minimizing material entering the environment. Source reduction is therefore the way forward. While there is an overwhelming desire and will on sustaining the environment, the most important next step is engaging stakeholders in a collaborative way to put it into practice.. The responsibility for waste is not of or by someone, but of and by everyone, until waste is eliminated.

FOOD FORTIFICATION: THE KEY FOR IMPROVING MATERNAL AND CHILD NUTRITION



AUTHOR Ms Prerana Patil, Food Technologist, PFNDAI

Development Association of India (PFNDAI) conducted on 19th November 2021 a webinar in association with Hexagon Nutrition on the topic "Food Fortification: The Key For Improving Maternal and Child Nutrition". Many experts from the field were invited as speakers and panellists for enlightening our participants about



SPEAKERS

the role of food fortification in improving maternal and child nutrition.

The Webinar was Chaired By Dr. B Sesikeran (Former Director, -National Institute of Nutrition (ICMR), Hyd, Chairman Sci. Advisory Committee, PFNDAI). The Speakers were Dr. Yeshwant K Amdekar (Former Professor of Pediatrics & President of the Indian Academy Of Pediatrics), Ms. Megha Mandke (Lead-Technical Marketing, Hexagon Nutrition), Ms. Richa Mattu (Nutrition Lead, Hindustan Unilever). On The Panel. We Had Ms. Sukhada Bhatte (Registered Dietitian, IDA-India), Dr. Bhavna Sharma (Head -Nutrition Science, ITC Foods), Ms. Nadiya Merchant (Sr Manager -Nutrition, Kellogg India), Ms. Zamurrud Patel (HOD, Chief Dietician, Global Hospitals, Mumbai), Dr. Madhavi Marathe (Sr Manager, Healthcare Nutrition Science, Danone.). Ms. Shervl Salis (Founder & Director, Nurture Health Solutions).

The webinar started with the welcome address by Dr. J. S. Pai (Executive Director, PFNDAI). This was followed by opening remarks from Dr. Sesikeran. In his remarks, he explained how fortification is important and about its potential of becoming a profitable investment. Though a diversified diet is the best choice for acquiring all the essential micronutrients, still we lack in this aspect. So, fortification can be a great option for getting all the required nutrition irrespective of one's socioeconomic status.

PFNDAI Jan 2022

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DR YESHWANT KRISHNA AMDEKAR

Pediatrician, President of Indian Academy of Pediatrics

Ms. Dolly Soni (Executive-Marketing & Digital, PFNDAI & Convener of Webinar), introduced all the speakers before their respective presentations. There were three presentations followed by a panel discussion.

The event proceeded as follows-

1. Micronutrient deficiencies among children during growth The first speaker for the webinar was Dr. Amdekar. He emphasized the understanding and

perspective of healthcare professionals/ physicians regarding micronutrient and their deficiencies. Here are some of the highlights from his presentation-

• Clinical nutrition addresses to prevention, diagnosis, and management of nutritional deficiencies of essential micronutrients like vitamins and minerals.

· Cellular damage caused by

the free radicals can be negated by the protective foods. Protective foods have a significant amount of antioxidants, which largely come from micronutrients and protein.

• There are gaps in the understanding of the micronutrient deficiencies. Clinical deficiencies may not be evident that often but the subclinical deficiencies are always around. These deficiencies are highly prevalent in all socioeconomic groups.

• Data on morbidity and mortality due to micronutrients indicate that nearly

5% of deaths of children below 5 years can be attributed to micronutrient deficiencies. As micronutrients look after cellular function and are important for





MS MEGHA MANDKE

Lead- Technical Marketing, Hoxagon Nutrition



immune-protection. Many other
factors like bioavailability, digestion,
absorption, utilization, the balance
between increased needs and losses
may contribute to the ultimate
nutritional deficiencies.
In widely prevalent PEM the

micronutrient deficiencies are hidden.

• Understanding the genesis of micronutrient deficiencies is of prime importance. Hence doctors need to change from disease managers to health providers. He concluded his presentation by highlighting the importance of the effective application of knowledge in order to overcome these deficiencies. It is important to have a budget-oriented nutritional management system in order to provide adequate information to achieve nutritional requirements within their financial limits.

> 2. Food fortification of Different Food Products The second speaker for the webinar was Ms. Mandke. She explained the fortification of different Food products. Here are some highlights from her presentation-

• Food fortification is nothing but enrichment of foods with vitamins and minerals. According to the global hunger index report, 2021 India scores 27.5% which indicates serious hunger. The ongoing pandemic may lead to 10% more growth in hunger levels.

• India is the major producer of important crops in the world but Food Fortification: The Key for Improving Maternal and Child Nutrition



despite this, we are not able to provide enough food and nutrition to the majority of the population. Malnutrition is the major contributor to diseases in the world. Fortification can be an investment for the future as it contributes to a healthier society.

• The major populations consume more cereals than the protective foods like milk, meat, vegetables, and fruits. Hence fortifying staple foods can be a good option. • Rice is a staple in almost 65% of households. Its fortification can fill up the gas of staple fortification. Extrusion can be used in the preparation of fortified rice. So, the rice can be fortified with iron. vitamin B12, and folic acid according to FSSAI. Retention of nutrients is better in fortified rice upon cooking than the non-fortified one.

Wheat flour can be fortified with Vit E, iron, and folic acid. This could help in reducing micronutrient deficiencies like anemia and birth defects in children.
Fortifying the salt with iodine and

iron will help in combating its deficiency.

• Four categories of processed food can be fortified - breakfast foods, instant noodles, bakery products, fruit juice.

Ms. Mandke concluded her presentation by stating the importance of a diversified diet and



the need for a universal approach. 3. Women's Micronutrient Needs The last speaker for the webinar was Ms. Richa Mattu, she highlighted the micronutrient needs of women at different stages of growth. Following are some of the main points from her presentation- According to the United Nation Food Summit- Women are up to 11% more likely than men to suffer consequences of food insecurities. • Meeting the global nutrition target remains a

challenge. In 2019, the percentage of anemia was 29%, which is supposed to be taken down to 14%.
If the weight of a girl child is less then it can face a higher mortality rate, increased risk of chronic diseases, and impaired development.
Adolescent girl nutrition is important. As rapid growth is achieved in this stage.
Maternal nutritional status affects the infant's birth weight. Low-birthweight babies are likely to suffer from diabetes, hypertension, and

heart diseases.

• As the height of the mother increases the rate of mortality.

stunting, and low birth weight decrease significantly. • Maternal micronutrient deficiency can lead to hormonal adaptation and restricted fetal growth, which will

PROTEIN FOODS AND NUTRITION DEVELOPMENT ASSOCIATION OF INDIA

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eventually lead to chronic diseases. She concluded by stating that it is important to invest in the health of children and adolescents as it is linked to the health of a future generation. The intergenerational cycle of low birth weight and undernutrition can be broken down by investing in the nutritional needs of

the adolescent group. Also, the maternal diet can have a huge impact on the development of chronic diseases.

Food Fortification: The Key for Improving Maternal and Child Nutrition



Ms Sukhada Bhatte



Ms Sheryl Salis



Ms Zamurrud Patel



Dr Madhavi Marathe



Dr Bhavna Sharma



Ms Nadiya Merchant

PANEL DISCUSSION



Dr B Sesikeran

Ms Dolly Soni

Each presentation was followed by a question and answer session where the respective speaker answered the questions raised by the audience. After the completion of all the expert talks, a panel discussion on the various aspects of food fortification and maternal and child nutrition was conducted. Panel's discussion was moderated by Dr. Sesikeran. In this panel discussion, the panel members shared their views about food fortification and the importance of maternal and



child nutrition. Here are some of the topics, which were discussed-• Traditional foods like ragi, sattu for children and expectant mothers in comparison to the new products that we get from the shelf.

- Vegetarian or non-vegetarian diet for pregnant and lactating women
- Are tonics good for women and children
- Factors responsible for the growing interest in plant protein
- Dietary requirements of
- diabetic women and children
- The importance and ways of including millets in the children's diet

• Higher needs of children and the capability of a vegan diet to provide that nutrition The webinar concluded with the vote of thanks by Ms. Dolly Soni.



REGULATORY ROUND UP



Dear Readers

Please find below FSSAI notifications, advisories, orders, etc since the last round up. Please stay safe.



Notification

Final notification amending the standards milk products including ghee and other milk fat products. The amendment defines "milk analogue" and their labelling requirements. Some clarity for products like Cheese analogue. etc. All milk, milk products and composite milk products as defined in the regulation can carry a specific symbol to indicate that they are derived from milk. Ghee By Dr. N. Ramasubramanian, Director, VR FoodTech, n.ram@vrfoodtech.com

standards have been revised and are applicable on all India basis and if complied with,

can do away with the AGMARK certification.

Additional laboratories recognized by FSSAI

Draft Notification

Draft notification amending and introducing standards in a wide variety of foods including Unrefined oils, Desiccated coconut, Wheat Flour or Resultant Wheat flour, millets, limit on reducing sugar in sugarcane Jaggery and Palmyrah Jaggery, Refined Iodized Salt, Low Sodium Salt, Coconut Neera, Liquid nitrogen dosing in 'Natural Mineral Water' and 'Packaged Drinking Water',



Substances added to Food, Microbiological Standards etc. The notable one is the microbial standards for Health Supplement and Nutraceutical products.



Draft notification proposing to include genetically modified enzymes as processing aid. FSSAI vide its letter dated 12 July 2021 has provisionally permitted the use of these genetically modified enzymes on the basis that they are already in use. Now the draft is put out for comments.

Draft notification prosing amendments in the criteria for nutrient content and comparative claims. However, these provisions are already operationalized and are being followed by FBOs.



extended.

<u>31 December 2021 was</u> <u>the deadline for the</u> <u>manufacturers of Health</u> <u>supplement products with</u> <u>State licence to migrate to</u> <u>Central License. This</u> <u>deadline has been</u> <u>extended to 31 March</u> <u>2022.</u>



Advisories, Orders and Clarifications.

<u>Use of Gaurana (Paullinia</u> <u>Cupana) has been restricted.</u>

Guarana extract as an ingredient or a source of caffeine in any product is prohibited without prior approval of FSSAI. Pure caffeine extracted from Guarana is permitted.

Latest list of FSSAI recognized testing laboratories

Deadline for compliance with requirements of Calcium and Magnesium in packaged drinking water has been



FSSAI vide its letter dated 23 December 2021 has categorically stated that only Food Safety Officers (State/Central) can inspect the premises of Food Business Operators Aggregators or Intermediaries facilitating sale of Organic produce between Farmers/ small original producers and producer organizations and end consumers are exempted from obtaining organic certification.

However, many conditions are imposed to avail this exemption.



RESEARCH IN HEALTH & NUTRITION

Beyond childhood: Picky eating in college students Science Daily October 7, 2021

Looking beyond the picky eating of childhood, researchers looked at this behaviour in college students.

Self-identified picky eaters ate significantly less fibre and vegetables and reported greater levels of social phobia than non-picky eaters, according to a new study in the Journal of Nutrition Education and Behavior, published by Elsevier. Social phobia is the fear of being evaluated during everyday activities by others.

"Picky eating is typically defined as the rejection of both familiar and new foods. It is a common occurrence during childhood; however, there are cases in which picky eating can persist into adolescence and adulthood. The primary aim of this study was to examine relationships between picky eating behaviours and dietary consumption as well as some of the psychosocial outcomes that might be associated with this, like social phobia, quality of life and picky eating distress. We were also interested in examining picky eating



as an eating identity," said Lauren Dial, PhD, Department of Psychology, Bowling Green State University, Bowling Green, OH, USA.

Of the 488 Midwestern undergraduate students, 190 identified as a picky eater (almost 40%). Most picky eaters (65%) reported consuming a diet of fewer than 10 foods. In addition to social phobia, picky eating was associated with overall and situational distress and lower



quality of life. The challenges of picky eaters included finding acceptable food, not eating, other people they were eating with, and excessive meal planning.

Interestingly, some benefits of picky eating reported by participants resembled versions of reported challenges. For example, difficulty finding acceptable foods is opposite to enjoying

simplicity in selecting foods or restaurants.



Research in Health & Nutrition



However, participants from the same sample viewed eating in restaurants as a challenge and a benefit. These qualitative results suggest that picky eating in adulthood is a multifaceted, complex phenomenon in which the variability in reported challenges and benefits may depend on variables like age, gender and social support.

"Overall, this study sheds some more light on the consequences of picky eating in young adults and might help future research identify how picky eating is related to other eating behaviours," Dial said.



Is low-fat or whole-fat milk better for kids? Science says it makes no difference

Science Daily October 12, 2021

A world-first study from Edith Cowan University (ECU) has found whole fat milk is just as good for kids as low fat.

The research, published by the American Journal of Clinical Nutrition today, suggests current public health advice recommending children over the age of two consume low fat dairy products may need to be revised.

ECU's Associate Professor Therese O'Sullivan led the investigation into the consumption of full-fat dairy products in children as part of the Milky Way study.

Over a three-month period, 49 healthy children aged four to six were randomly allocated to receive either whole fat or low-fat dairy products in place of their normal dairy intake. Dairy products were home delivered every fortnight in plain packaging at no cost to the participants, to ensure purchase price wasn't a factor.



Neither group knew whether they were consuming whole fat or low-fat dairy, while any leftover products were weighed each fortnight to assess the children's overall intake.

No health changes

For the first time, researchers comprehensively measured the children's obesity, body composition, blood pressure, and blood biomarkers to monitor the effects of their dairy consumption. Regardless of whether they were consuming whole fat or low-fat





dairy, both groups of children took in similar amounts of calories. Although children consuming lowfat dairy took in less calories and fat from dairy, they naturally turned to other foods and drinks to make up this difference.

Professor O'Sullivan said the findings showed no significant differences between the groups' obesity or cardiovascular health. "It had previously been thought young children would benefit from low fat dairy products due to their lower levels of saturated fats and lower density of energy, in turn helping avoid obesity and risk of associated cardiometabolic diseases," she said.

"Our results suggest healthy children can safely consume whole fat dairy products without increased obesity or adverse cardiometabolic effects. With consideration of our results and previous research, future revisions of dietary guidelines should consider recommending children aged two and over can consume either whole fat or reduced fat dairy."

Dietitian and PhD candidate on the study Analise Nicholl said this would make life easier for parents. "This evidence-based approach would help simplify parents' dairy

choices and allow children to consume dairy accordin g to their individua



Mushroom consumption may lower risk of depression

Science Daily October 12, 2021

Mushrooms have been making headlines due to their many health advantages. Not only do they lower one's risk of cancer and premature death, but new research led by Penn State College of Medicine also reveals that these superfoods may benefit a person's mental health.

Penn State researchers used data on diet and mental health collected from more than 24,000 U.S. adults between 2005 and 2016. They found that people who ate mushrooms had lower odds of having depression. According to the researchers, mushrooms contain ergothioneine, an antioxidant that may protect against cell and tissue damage in the body. Studies have shown that antioxidants help prevent several mental illnesses, such as schizophrenia, bipolar disorder and depression.



"Mushrooms are the highest dietary source of the amino acid ergothioneine -- an antiinflammatory which cannot be synthesized by humans," said lead researcher Djibril Ba, who recently graduated from the epidemiology doctoral program at the College of Medicine. "Having high levels of PROTEIN FOODS AND NUTRITION DEVELOPMENT ASSOCIATION OF INDIA

this may lower the risk of oxidative stress, which could also reduce the symptoms of depression."

White button mushrooms, which are the most commonly consumed mushroom variety in the U.S., contain potassium, which is believed to lower anxiety. In addition, certain

other species of edible mushrooms, especially Hericium erinaceus, also known as Lion's Mane, may stimulate the expression of neurotrophic factors such as nerve growth factor synthesis, which could have an impact on preventing neuropsychiatric disorders including depression.

According to the researchers, collegeeducated, non-Hispanic white women were more likely to eat mushrooms.

The average age of surveyed participants was 45, and the majority (66%) were non-Hispanic white people. The investigators observed a significant association between mushroom consumption and lower odds of depression after accounting for socio-demographics, major risk factors, self-reported diseases, medications and other dietary factors. They said, however, that there was no clear additional benefit with relatively high mushroom intake.

"The study adds to the growing list of possible health benefits of eating mushrooms," said Joshua Muscat, a Penn State Cancer Institute researcher and professor of public health sciences.

The team conducted a secondary analysis to see if the risk of depression could be lowered by



replacing a serving of red or processed meat with a serving of mushrooms each day. However, findings show that this substitution was not associated with lower odds of depression.

Prior to this research, there have been few studies to examine the association between mushroom consumption and depression, and the majority have been clinical trials with fewer than 100 participants. The researchers said this study highlights the potential clinical and public health importance of mushroom consumption as a means of reducing depression and preventing other diseases.

The researchers noted some limitations that could be addressed in future studies. The data did not provide details on the types of mushrooms. As a result, the researchers could not determine the effects of specific types of mushrooms on depression. Food codes issued by the U.S. Department of Agriculture were used to determine mushroom intake; therefore, some entries may have been misclassified or inaccurately recorded.

John Richie and Xiang Gao from Penn State Cancer Institute; Laila Al-Shaar and Vernon Chinchilli from Penn State College of Medicine; and Robert Beelman from Penn State College of Agricultural Sciences also contributed to this research. The researchers declare no conflicts of interest or specific funding support.







Filling half of kids' plates with fruits and veggies helps increase consumption

Science Daily October 18, 2021

Filling half of a child's plate with fruits and veggies isn't just recommended by the United States Dietary Guidelines, it also helps increase the amount of produce that kids end up eating, according to Penn State research.

In a controlled feeding study, the researchers tested two strategies for encouraging kids to eat more fruits and vegetables. The first was simply adding 50 percent more to fruit and vegetable side dishes at kids' meals throughout the day. The second was substituting 50 percent more fruits and vegetables for an equivalent weight of the other foods. For example, if they added 50 grams of veggies to the lunch meal, they also subtracted 50 grams of mac-andcheese.

The researchers found that adding more fruit and vegetable side dishes resulted in the kids eating 24 percent more veggies and 33 percent more

fruit compared to the control menus. Substituting fruits and veggies for some of the other foods resulted in kids consuming 41 percent more veggies and 38 percent more fruit. Barbara Rolls, Helen A. Guthrie Chair and director of the Laboratory for the Study of Human Ingestive Behaviour at Penn State, said the findings suggest ways parents, caregivers and schools can help encourage healthy eating.

"When deciding what to feed kids, it's easy to remember that half of the food should be fruits and vegetables," Rolls said. "If you start seeing that you're serving too much and have more waste, you could cut back the higher calorie-dense food while adding more produce. Experiment and have some fun trying different fruits and vegetables to see what they like and so you can serve meals with a sensitivity to their personal taste."

The study was recently published in the American Journal of Clinical



Nutrition. According to a previous study by the Centers for Disease Control and Prevention, about 60 percent of children don't eat enough fruit and 93 percent don't eat enough vegetables, suggesting a need for strategies to encourage kids to eat more produce.

Since 2011, the MyPlate dietary guidelines have encouraged people to fill half their plates with fruits

and vegetables, with the hope that this would also increase people's intake. But the researchers said that despite being a policy for a decade, the strategy had never been systematically tested in preschool children.

> "For most foods, kids will eat more



when served larger portions, so we wanted to test whether increasing the amount of fruits and vegetables that are served over five days would increase intake," said Liane Roe, research nutritionist at Penn State. "We also wondered whether substituting produce for other foods would increase intake more than simply adding extra fruits and veggies."

For the study, the researchers recruited 53 children between the ages of three and five who were enrolled in Pennsylvania childcare centres. Each participant was served all their meals and snacks for five days during three different periods in a random order.

For the control period, they were served meals they typically got in their childcare centre, and for the period testing the addition strategy, the portions of fruits and vegetables were increased by 50 percent. For the period testing the substitution strategy, fruits and vegetables were increased by 50 percent and the other foods were reduced by an equivalent weight.

"We served the children all of their meals, snacks, and beverages for five consecutive days, and we weighed all the items we served, as well as the leftovers, to measure intake," Roe said. "We sent home evening and morning snacks for the kids, but the majority of the meals were served in the childcare centre."



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Research in Health & Nutrition



As a caution, Rolls said that even though the study was successful in getting kids to eat more fruits and vegetables, the majority of the kids still didn't eat the recommended daily amount of vegetables for their age group -- about a cup and a half -- although they did reach this target for fruits.

The researchers said that in addition to the strategies in the current study, there are additional things parents and caregivers can do to increase intake. "Serving fruits and vegetables as a first course or snacks when kids are hungry can boost their intake, as can incorporating them into mixed dishes," Rolls said. "For example, you can blend some cauliflower or squash into a sauce for mac and cheese or add fruit puree into a brownie or cake mix. You don't decrease the palatability of the dish, but the kids are eating more produce. You should also encourage them to eat the whole veggies on their own, as well as incorporating them into other foods.'

UK study to assess vitamin A drops for reversing COVID-19 smell loss

29 Sep 2021 Nutrition Insight

Vitamin A nasal drops might help

people regain their sense of smell after viral infections, including COVID-19. This is the hypothesis of UK researchers, who will embark on a two-year study to help improve the lives of millions around the world who suffer from smell loss. Sensory deficit can have a significant impact on nutrition, triggering unhealthy eating habits, for example.

"If we can provide better evidence for an effective treatment for viral smell disorders, this will be a major step forward as high-quality clinical studies have been lacking in this field to date," Carl Philpott, professor at University of East Anglia and James Paget University Hospitals NHS Trust, tells NutritionInsight. He adds that if this is found to be effective, treated beneficiaries will be better able to regulate their nutritional intake.

A "big problem"

Even before the COVID-19 pandemic hit, smell loss was thought to affect an estimated 5% of people, with viruses accounting for one in ten of those. However, the pandemic has created an "unprecedented" worldwide demand for treatment. According to Philpott, around one in ten people who experience smell loss as a result of COVID-19 report that their sense of smell has not returned to normal four weeks after falling ill.

"It's a big problem, and our previous research has shown the impact of smell loss – including depression, anxiety and isolation, as well as risk of danger from hazards such as gas and spoiled food, and changes in weight due to reduced appetite." He notes that around a third of people with smell loss lose weight, while a third gain weight. "Ironically, some people will eat



Hyposmia / Anosmia



more take-out foods, trying to get some stimulation of flavour."

Why vitamin A?

Philpott's team is inspired by a German study from four years ago that showed people treated with vitamin A nasal drops improved twice as much as those in the untreated group. "We want to find out whether there is an increase in the size and activity of damaged smell pathways in patients' brains when they are treated with vitamin A nasal drops. This would show recovery of the damage caused by common viral infections, including COVID-19, in the nose," says Philpott.



He theorizes that topical vitamin A treatment will encourage regeneration of the olfactory epithelium – which is damaged by respiratory viruses responsible for the common cold – and help restore

the sense of smell in sufferers.

Smelling Distinctive Odours

The researchers aim to recruit 57 participants who have lost their sense of smell due to a viral infection. They will either receive a 12-week course of nasal vitamin A



drops or inactive equivalent drops. Commenting on the potential for other delivery formats, Philpott explains that evidence points to nasal drops being the most beneficial.

The participants will then have their brains scanned before and after treatment. "They will be smelling distinctive odours - roses and rotten eggs – while special MRI brain scans are taken," details Philpott. The researchers will look for changes in the size of the olfactory bulb - an area above the nose where the smell nerves join together and connect to the brain. They'll also look at activity in areas of the brain linked to recognizing smells. Earlier this month, Nutricia urged nutrition to be integrated into medical care to improve COVID-19 patient recovery in hospital and after discharge. It noted that loss of smell and taste can contribute to further worsening of nutritional issues. In June, a survey of UK consumers found that nearly two-thirds had made changes during the pandemic to improve their health.

By Katherine Durrell

Healthy gut microbiome essential for post-exercise muscle growth, study finds 27 Sep 2021 Nutrition Insight

A healthy gut microbiome is necessary for skeletal muscles to fully grow after exercise, according to a study from the University of Kentucky, US.

The study findings suggest the gut microbiome makes

substances that help skeletal muscles to become larger after exercising. The study further contributes to the growing body of evidence showing a connection between the gut microbiome and skeletal muscles.

"If we can identify the substances that gut bacteria are making to help muscles grow after exercise, we might be able to use some of those substances to promote the growth of muscles in people suffering from the loss of muscle as typically seen with aging or cancer," explains Taylor Valentino, first study author.

From an athletic standpoint, worldclass runners were found to have more of a particular type of bacteria that provided an additional source of energy, which was thought to help them run faster. "Thus, the gut microbiome makes substances that appear to be important for skeletal muscles to fully adapt to exercise as well as help improve athletic performance," says John McCarthy, senior study author. The study found that the muscles of mice without an intact microbiome did not grow as much as the muscles of healthy mice, even though both groups of mice ran the same amount over the nine weeks of wheel running.

The microbiome and skeletal muscles

Previous studies suggest the gut microbiome may be necessary for the health of skeletal muscles. Therefore the researchers wanted to determine if a healthy gut microbiome is essential for skeletal muscle to adapt to exercise.

"We are currently trying to determine how exercise changes the composition and function of the gut microbiome. This investigation, along with other studies in bacteria,

will allow us to identify the substances made by the gut microbiome



that help the skeletal muscle to grow larger in response to exercise," adds McCarthy.

To study this further, the researchers let mice voluntarily exercise on running wheels every day for nine weeks, with some mice administered antibiotics through their drinking water. The antibiotic treatment killed the bacteria of the gut microbiome. They then compared healthy mice's muscles to those without an intact microbiome to see if the muscles adapted differently to wheel running.

Study limitations

Although the researchers used a relatively low dose of antibiotics compared to previous studies, a limitation of the study is that the researchers do not know if the antibiotics might have directly affected the ability of the skeletal muscle to adapt to exercise.

The initial research was conducted using only female mice.



Therefore researchers do not know if the findings will be the same in male mice. Finally, as with all animal studies, it is unclear whether or not the results will translate into humans.

Industry players have shown interest in the potential of probiotics and vitamins for muscle health. In March. Hum Nutrition unveiled Core Strength, a protein powder that includes a blend of flaxseeds and probiotics to help build lean muscle.

Research in Health & Nutrition



Meanwhile, researchers from the UK found that vitamin C holds potential in muscle maintenance for elderly populations. A separate study supported by TSI found that muscle loss in the elderly was minimized through a combination of beta-hydroxy beta-methyl butyrate (HMB) and vitamin D. Edited by Nicole Kerr

Saffron extract promotes sleep amid "COVIDsomnia," finds Pharmactive study

01 Sep 2021 Nutrition Insight

Pharmactive's standardized saffron extract, Affron, has been shown to promote restorative sleep even when taken as a single, low dose an hour before bedtime. According to the company, the results from the human clinical trial are also the first to suggest a novel mechanism of action for Affron on melatonin levels.

"This study opens Affron to more consumers, since it demonstrates that even at a low dosage it promotes natural melatonin in the body. Product developers and manufacturers may include 14 mg in new product ideas," Julia Díaz, head of marketing at Pharmactive,



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tells NutritionInsight. "This study also shows that there is an improvement in sleep quality ratings and also a significant improvement in mood ratings after awakening."

Melatonin without Side Effects

The study, published in Sleep Medicine, included 120 physically healthy male and female adults, aged 18 to 70 years, with selfreported unsatisfactory sleep lasting longer than four weeks. For 28 days, the randomized participants received either a placebo or different doses of Affron one hour before going to bed.

Compared to the placebo, Affron supplementation was associated with greater improvements in the primary outcome measures of sleep



quality ratings, mood ratings after awakening, the ISQ total score and ISQ-insomnia classifications .

According to Pharmactive, the results were the first to reveal increased levels of melatonin in the participants taking Affron. Melatonin is well known as a hormone that regulates many biological functions, including sleep and circadian rhythms. Poor sleep in adults has been associated with low melatonin production.

Díaz emphasizes that there are multiple benefits to taking Affron over melatonin. "Affron is a natural ingredient of botanical origin, and it has not shown any side effects. Artificial melatonin has shown some collateral effects in some studies in the short and medium terms."

Sleep Concerns Compound

These findings come as the pandemic drives rising stress levels and occasional sleep difficulties. Pharmactive points to a survey finding that only 55 percent of adults are satisfied with their sleep,



and 70 percent report they are experiencing one or more new sleep challenges since the beginning of the COVID-19 pandemic.

The survey also found that 43 percent of respondents were troubled by waking up during the night, and 37 percent said the pandemic was negatively impacting their ability to sleep well. This transitional "COVID-somnia" as many experts have dubbed it, includes occasional "problems falling or staving asleep, sleeping less, experiencing worse quality sleep and having more disturbing dreams. In July, a Nature Made survey found that one in three people have difficulty falling asleep, while PharmaLinea previously flagged that 2021 has seen Google searches for "sleep supplement" skyrocket.

New Applications Around the Corner

Armed with these insights, Pharmactive plans to continue investing in new clinical studies for Affron. Díaz also notes that new



applications for different consumer groups are in the pipeline. Affron is already backed by eight human clinical studies that demonstrate its capacity to help improve mood, relieve symptoms associated with



stress and occasional sadness, support relaxation and improve menopausal women's mood. In May, a patent recognized Affron as an aid for low mood-related issues in the US. The following month, Siparex acquired a minority stake in Pharmactive.

By Katherine Durrell

Hair health and nutrition link: Supplements and lower fat consumption show

promise 23 Sep 2021 Nutrition Insight

Scientists are exploring the relationship between hair health and nutrition, with North American Menopause Society (NAMS) research finding that nutrientbased bioactive compounds

boost hair growth in menopausal women. Meanwhile, a Tokyo Medical and Dental University (TMDU) study linked fat consumption to increased hair loss risk.

Menopause and hair health

This new study found that supplementation with bioactive compounds derived from food sources may effectively promote hair growth in perimenopausal, menopausal and postmenopausal women.

"With the aging of our society and the fact that women now spend approximately one-third of their lives in the postmenopausal period, research into interventions for menopause symptoms, including hair thinning, is critical, especially with therapeutic options being so limited," says Dr. Glynis Ablon, lead study author, from the Ablon Skin Institute and research center in California, US. "Hair loss is a significant concern for midlife women," adds Stephanie Faubion, NAMS medical director. "Additional research will help confirm the long-term efficacy of nutraceutical supplements."

Hormones and hair loss

Hair thinning is one of the many symptoms that accompanies the menopause transition. Approximately 40% of women over 60 years old will experience what is known as female pattern hair loss or

androgenetic alopecia. This group of women have hormone changes associated with decreased hair growth and the percentage of hairs and time spent in the anagen phase.

Researchers from the NAMS compared results at six months and twelve months of treatment and found that mean total hair counts increased significantly and progressively.

Global hair quality improvements significantly increased by 40% with few or no side effects and decreased hair shedding. The study results will be presented during the NAMS' Annual Meeting in Washington, DC, between September 22 to 25.

Obesity and hair health link

The TMDU study found that obesity can lead to depletion of hair follicle stem cells (HFSCs) through the induction of specific inflammatory signals, blocking hair follicle regeneration and ultimately resulting in loss of hair follicles. The TMDU study may open the door for future prevention and treatment of hair thinning and for an understanding of obesity-related diseases, the researchers say.



The team used mouse model experiments to examine how a highfat diet or genetically induced obesity can affect hair thinning and loss. Normally, HFSCs self-renew every hair follicle cycle. This is part of the process that allows hair to grow back continuously. "As we age, HFSCs fail to replenish themselves, leading to fewer HFSCs and hair thinning," the researchers say.

Although overweight people have a higher risk of androgenic alopecia, whether or not obesity accelerates hair thinning or how the molecular mechanisms behind it work have been largely unknown. "High-fat diet feeding accelerates hair thinning by depleting HFSCs that replenish mature cells that grow hair, especially in old mice," says Hironobu Morinaga, lead author of the study.

Sonic hedgehog signalling

Throughout the research, the gene expression compared HFSCs between HFD-fed mice and standard diet-fed mice. It also traced the fate of those HFSCs after their activation, comments Morinaga. "We found that those HFSCs in HFD-fed obese mice change their fate into the skin surface corneocytes or sebocytes that secrete sebum upon their activation. Those mice show faster hair loss and smaller hair follicles along with depletion of HFSCs".





"The gene expression in HFSCs from the high-fat-fed mice indicated the activation of inflammatory cytokine signaling within HFSCs," describes Emi Nishimura, senior study author. "The inflammatory signals in HFSCs strikingly repress Sonic hedgehog signaling that plays a crucial role in hair follicle regeneration in HFSCs. The researchers confirmed the activation of the Sonic hedgehog signaling pathway in this process could rescue the depletion of HFSCs. "This could prevent the hair loss brought on by the high-fat diet," concludes Nishimura. Edited by Nicole Kerr



Study assesses connection between COVID-19 vaccination, diet and immunity

02 Sep 2021 Nutrition Insight

As COVID-19 vaccinations roll out globally, Biosearch Life is highlighting the role that diet can have on efficacy.

Ahead of the Spain-based biotechnology company's webinar, NutritionInsight speaks with two experts about the interplay between

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nutrition and vaccines, as well as the lasting impact the pandemic will have on industry. "Diet, immunity and vaccines are closely related. The effectiveness of a vaccine depends on the immune status of the person," explains Mónica Olivares, R&D director at Biosearch Life.

This is why, for example, the effectiveness of vaccines is lower in elderly people who show some dysfunction of the immune response than in young individuals. The impact of diet on the immune system is well-known and is therefore a key factor for the optimal functioning of the immune system, Olivares continues.

"In this context, the bacteria that are part of our diet, either in fermented

foods or as probiotic supplements, play a very relevant role. We could say that they act as 'trainers' for the cells of the immune system, preparing them to act at their maximum

capacity in case of infections."

Probiotics modulate immune system

According to Innova Market Insights, over three-quarters of consumers say that probiotics are at least somewhat important for immunity, with 67 percent saying the same about prebiotics. "Increasing evidence shows that particular strains of probiotics play a role in modulating the immune system," explains Olivares.

In addition, particular strains of probiotics may help to support the immune system by promoting the production of natural antibodies in the body and supporting the growth of beneficial gut bacteria.



Embracing holistic approaches

Another trend within immunity is a holistic and preventative approach. This could include choosing foods naturally rich in nutrients, such as vitamins, minerals and probiotics, explains Beatriz Botija, product manager of probiotics at Biosearch Life.

"Numerous market studies show that immunity has become a priority



for many consumers around the world. They are looking to take a more preventative approach to health and improve immune health in order to face

future infections." She continues that this increased awareness of immunity has also led to an increased awareness of nutrition and how improving the diet can support immune health. "As the World Health Organization's dietary guidelines state, good nutrition is crucial to health, especially at times when the immune system might need to fight back."







Eyeing the future

Immunity was top-of-mind throughout 2020 and 2021 and will continue to be in the future, predicts Botija. "Since immunity concerns are here to stay, many people will be looking for proven immune health support solutions that do not interfere with their daily routine. Some of the solutions could be fortified foods or beverages and dietary supplements."

Olivares adds that other long-term impacts of COVID-19 are difficult to estimate. "The fact that those vaccinated can become infected and contagious, as well as its ability to mutate, complicates the resolution of the pandemic and suggests that this new virus will coexist with us just as other viruses such as influenza do. Vaccines will be key to reducing the severity of cases and the virus's ability to spread," she states.

By Katherine Durrell

A heart-healthy protein from bran of cereal crop

Science Daily January 22, 2020

Foxtail millet is an annual grass grown widely as a cereal crop in parts of India, China and Southeast Asia. Milling the grain removes the hard outer layer, or bran, from the rest of the seed. Now, researchers have identified a protein in this bran that can help stave off atherosclerosis in mice genetically prone to the disease. They report their results in ACS' Journal of Agricultural and Food Chemistry.

Atherosclerosis, or narrowing of the arteries because of plaque buildup, is the leading cause of heart disease and stroke.

Plaques form when immune cells called monocytes take up oxidized low-density lipoprotein cholesterol (ox-LDL) in the artery wall. These cells then secrete proinflammatory cytokines, causing aortic smooth muscle cells to migrate to the site. Eventually, a plaque made up of cholesterol, cells and other substances forms. Drugs called statins can treat atherosclerosis by lowering LDL levels, but some people suffer from side effects.



Zhuoyu Li and colleagues previously identified a protein in foxtail millet bran that inhibits the migration of colon cancer cells. They wondered if the protein, called foxtail millet bran peroxidase (FMBP), could also help prevent atherosclerosis.



To find out, the researchers treated human aortic smooth muscle cells and monocytes in petri dishes with FMBP. The millet protein reduced the uptake of lipids by both cell types and reduced the migration of smooth muscle cells.

In monocytes, FMBP treatment blocked the expression of two key proteins involved in atherosclerosis. Next, the team fed mice that were

genetically predisposed to atherosclerosis a high-fat diet. Mice that were then treated with either FMBP or a statin had far fewer plaques than untreated mice.

The FMBP-treated mice also had elevated blood levels of high-density lipoprotein cholesterol (HDL), the "good cholesterol." Based on these results, FMBP is a natural product with great potential in the prevention and treatment of atherosclerosis, the researchers say.





How millets sustained Mongolia's empires Science Daily March 3, 2020

The historic economies of Mongolia are among the least understood of any region in the world. The region's persistent, extreme winds whisk away signs of human activity and prevent the buildup of sediment which archaeologists rely on to preserve the past.

Today crop cultivation comprises only a small percent of Mongolia's food production, and many scholars have argued that Mongolia presents a unique example of dense human populations and hierarchical political systems forming without intensive farming or stockpiling grains.

The current study, led by Dr. Shevan Wilkin of the Max Planck Institute for the Science of Human History provides, for the first time, a detailed glimpse into the diets and lives of ancient Mongolians, underscoring the importance of millets during the formation of the earliest empires on the steppe.

Isotopic analysis and the imperial importance of millets

Collaborating with archaeologists from the National University of Mongolia and the Institute of Archaeology in Ulaanbaatar, Dr. Wilkin and her colleagues from the MPI SHH sampled portions of teeth and rib bones from 137 previously excavated individuals.

The skeletal fragments were brought back to the ancient isotope lab in Jena, Germany, where researchers

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extracted bone collagen and dental enamel to examine the ratios of stable nitrogen and carbon isotopes within. With these ratios in hand, scientists were able to reconstruct the diets of people who lived, ate, and died hundreds to thousands of years ago.

Researchers tracked the trends in diet through the millennia, creating a "dietscape" which clearly showed significant differences between the diets of Bronze Age peoples and those who lived during the Xiongnu and Mongol Empires. A typical Bronze Age Mongolian diet was based on milk and meat, and was likely supplemented with small amounts of naturally available plants.



Later, during the Xiongnu Empire, human populations displayed a larger range of carbon values, showing that some people

remained on the diet common in the Bronze Age, but that many others consumed a high amount of milletbased foods.

Interestingly, those living near the imperial heartlands appear to have been consuming more millet-based foods than those further afield, which suggests imperial support for agricultural efforts in the more central political regions. The study also shows an increase in grain consumption and increasing dietary diversity through time, leading up to the well-known Mongolian Empire of the Khans.

Rethinking Mongolian prehistory

The new discoveries presented in this paper show that the development of the earliest empires in Mongolia, like in other parts of the world, was tied to a diverse economy that included the local or regional production of grain. Dr. Bryan K. Miller, a coauthor who studies the historical and archaeological records of Inner Asian empires.



remarks that "these regimes were like most empires, in that they directed intricate political networks and sought to amass a stable surplus -- in this case a primarily pastoral one that was augmented by other resources like millet."

"In this regard," Dr. Miller adds, "this study brings us one step closer to understanding the cultural processes that led humanity into the modern world."

The view that everyone in Mongolian history was a nomadic herder has skewed discussions concerning social development in this part of the world. Dr. Wilkin notes that "setting aside our preconceived ideas of what prehistory looked like and examining the archaeological record with modern scientific approaches is forcing us to rewrite entire sections of humanity's past." Dr. Spengler, the director of the archaeobotany labs at the MPI SHH, emphasizes the importance of this discovery, noting that "this study pulls the veil of myth and lore off of the real people who lived in Mongolia millennia ago and lets us peek into their lives."





Meta-analyses: Higher vitamin D levels linked to lower COVID-19 rates

By Danielle Masterson 04-Nov-2021 -Food Navigator USA

Overwhelming evidence suggests a link between higher vitamin D levels and lower incidence and severity of COVID-19.

Sufficient blood vitamin D levels play an effective role in immune system functioning, which can contribute to a satisfactory cellular response and protect against the severity of infections caused by microorganisms. As a result, the pandemic provided an opportunity to highlight the role of vitamin D in supporting immune health.

The Council for Responsible Nutrition's Vitamin D & Me! Education Initiative recently highlighted 13 meta-analyses that included over 3 million participants. Overall, the findings suggest that higher blood levels of vitamin D are correlated with lower incidence or severity of COVID-19 in most of the research.

"We have known for years that vitamin D plays an important role in

immune health, and now there are multiple meta-analyses that appear to demonstrate the benefits of this nutrient in COVID-19," said Luke Huber, ND, MBA, vice president of scientific and regulatory affairs at the Council for Responsible Nutrition (CRN).

The meta-analyses were generated from over 100 studies published since the onset of the pandemic. Most examined blood levels of vitamin D and COVID-19, while two exclusively examined vitamin D consumption in relationship to the illness.

Key takeaways

Higher blood levels of vitamin D appear to be correlated with lower incidence of COVID-19 (in most but not all of the reviews). Severity of and mortality from COVID-19 was associated with lower vitamin D levels (in several but not all of the meta-analyses). One meta-analysis found reduced mortality with

vitamin D intervention following COVID-19 diagnosis, while a smaller metaanalysis had the same finding (the smaller study did not reach

statistical significance)

One of the strongest conclusions from one meta-analysis indicated that odds of getting infected with SARS-CoV-2 increased by 3.3 times in individuals with vitamin D deficiency and the probability of developing severe stages of COVID-19 is over 5 times higher in patients with vitamin D deficiency.

Other factors

While vitamin D levels appear to

Research in Health & Nutrition



play a significant role in outcomes and severity, the studies also noted other risk factors for severe illness, such as older age, male gender, obesity, cardiovascular disease, chronic lung disease, diabetes and cancer. Additionally, several studies have shown that Black, Hispanic and Asians account for a disproportionately higher number of hospitalizations and deaths due to COVID-19 in the United Kingdom and the United States. Because factors such as age and race cannot be altered, researchers are hoping to zero in on modifiable factors that might contribute to COVID-19 severity such as vitamin D levels.

While the overall consensus is that higher vitamin D levels are linked to lower COVID-19 rates and severity, the dosing is less certain as it varied widely across the studies. As several of these analyses pointed out, further research is needed to determine appropriate dose, duration, and mode of administration of vitamin D. "This growing body of research does not indicate that Vitamin D is a substitute for vaccines, mask wearing, social distancing, or other behaviours to mitigate the spread of the corona virus," said Huber, "but the data does suggest that vitamin D levels may play a role, in combination with other therapies, in strengthening the immune system to resist the virus."



SFOOD SCIENCE INDUSTRY NEWS

Slashing sodium in bread requires a multi-pronged approach, urge researchers 30 Sep 2021 Nutrition Insight

A combination of reducing salt quantity, physical modification, sodium replacements and flavour enhancers is the best way to slash sodium in bread without sacrificing taste and leavening ability. This is according to a new study from the University of Illinois, which aims to shed light on slashing sodium from a major source in US adults' diets.



Cupboard staple

Most people in the US consume too much salt; US adults typically eat twice the daily amount recommended by dietary guidelines. Bread may not seem like an obvious culprit – however, due to high consumption and relatively high salt content, baked goods are a major source of sodium in the diet.

"Bread is one of the staple foods in a lot of people's diets, and people generally don't stick to just one serving of bread," says Aubrey Dunteman, graduate student in the Department of Food Science and Human Nutrition at the University of Illinois, and lead author on the paper.

"About 70% of sodium in the US food supply comes from packaged and processed foods. And the top source is actually baked goods, so reducing salt in that particular category would help to reduce sodium consumption tremendously," adds study co-author Soo-Yeun Lee, professor of food science at the University of Illinois. "Salt is an essential nutrient, and this is why we crave it. However, we consume more than we should, just like sugar and fat. Salt is related with hypertension and other cardiovascular diseases. but it's the



amount that is the problem, not the salt itself."



Essential functionalities of salt Salt is an essential ingredient in bread making; it contributes to the structure and flavour of the bread, and is necessary for the yeast to work properly. Dunteman and Lee conducted an extensive review of academic literature on sodium reduction in bread. They identified four main categories: Salt reduction without any further mitigation, physical modification, sodium replacements and flavour enhancers.

"The most basic method is just reducing the amount of salt in the product," Dunteman says. "That can be good to a point, depending

on the original level of salt and equivalent in the recipe. There's always going to be a minimum amount of salt you need just to have the bread function and the yeast do its job. So it's a limited method, but it can help to reduce high



Modulating flavour

Another method of salt reduction is physical modification, which involves uneven distribution of salt in the product. "Sensory adaptation occurs when you have constant stimulus," Lee explains.

"If the salt is evenly distributed in a slice of bread, as you take more bites, it's going to taste less salty,

because you're already adapted to the first few bites. But if you have different distribution of salt, alternating between densely and lightly salted layers, people will perceive it as more salty. So you can obtain the same taste effect with less salt."

A third method involves replacement of sodium with other substances, such as magnesium chloride, calcium chloride, or potassium chloride.

"This is one of the most commonly used methods in industry, but it can only be used up to a certain point, before you get a bit of a metallic taste from these compounds," Dunteman points out.

The fourth method involves flavour modification with taste enhancers such as herbs and spices, or even monosodium glutamate (MSG). The researchers note multi-grain bread also allows for more salt reduction than white bread, because it has more flavour on its own.

Salt reducing synergies

Dunteman and Lee conclude the best approach to sodium reduction in bread will be a combination of methods. "One of the four categories, salt reduction, is technically



involved in all of them," Dunteman notes.

"Another category, salt replacement, is already heavily studied. We recommend more research into physical modification methods, as well as flavour enhancement types, and how to combine each of these methods with salt reduction."



There has been a proliferation of methods to reduce it to a healthier level. Salt of the Earth, for instance, recently collaborated with Israeli students on a seaweed sodium reduction solution and chickpea flavour enhancer.

Last month, nutrition groups worldwide urged the F&B industry to replace table salt with a reducedsodium, added-potassium substitute – deemed "a simple swap.

Reducing salt home

Finally, the researchers have some advice for home bakers looking to reduce sodium in their creations. "If you're interested in using less salt in your home-baked bread, you could try to reduce the amount to 50%, if you're using standard recipes that are widely available," Lee says.

"You'd be surprised that the dough would still rise, though the bread would taste a little different. You can also use flavour enhancers to provide the salty, savoury, satiating sensation you lose when you reduce the salt. But that wouldn't help with the rise, so you cannot remove salt 100%."

Edited by Benjamin Ferrer





Krill oil in Korea: MFDS proposes to follow CODEX standards to safeguard quality

By Tingmin Koe 06-Oct-2021- NutraIngredients Asia

South Korea is tightening its watch over the quality of krill oil by proposing to follow the CODEX standards, including setting a minimum requirement for phospholipids concentration and limiting the amount of linoleic acid and myristic acid.

Linoleic acid is found in vegetable oil while myristic acid is found naturally in palm oil, coconut oil, and butter fat. The Ministry of Food and Drug Safety (MFDS) said on September 30 that it is planning to follow the CODEX standards to safeguard the quality of krill oil consumer products.

The main reason is to ensure that krill oil products are not mixed with lower-priced vegetable oil, such as soybean oil. The MFDS is seeking public feedback on the

proposed changes, which will close on November 30.

According to its announcement, the amount of permitted linoleic acid and myristic acid is set at 3 percent

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or less, and between 5 and 13 percent respectively – in line with CODEX standards. Linoleic acid is found in large

amounts in vegetable oil. For instance, regular soybean oil contains about48 to 59 per cent of linoleic acid, while that of corn oil is usually between 34 and 65.6 per

cent, canola oil between 15 and 30 per cent, and 48.3 to 74 per cent for sunflower oil.



On the other hand.

soybean oil, canola oil, and sunflower oil only contains 0 to 0.2 per cent of myristic acid, while corn oil is between 0 and 0.3 per cent. Responding to queries from



Asia, Insik Kim, director and executive officer at South Korea based krill oil supplier Biocorp said that the local krill oil industry was taken aback by

NutraIngredients-



the announcement.

"MFDS's

announcement has shocked the Korean krill oil market," she said, adding that majority of the krill oil players were compliant with the producing quality

krill oil. She added that the lower limit for myristic acid was considered "a little bit tight" for highly concentrated krill oil. "In our experience, when phospholipid contents are highly concentrated, myristic acid goes down to around



five per cent," she said.

In addition, the MFDS highlighted that phospholipid concentration in krill oil should be at least 30 percent, which Kim said was an

"appropriate" requirement. Usually, krill oil contains about 40 to 50 per cent of phospholipids rich in DHA and EPA, alongside 30 to40 per cent of triglycerides. "It is necessary to prepare standards and specifications to eradicate the fraudulent practices of mixing krill oil –which has recently been gaining attention as a health food – with other low-priced edible oils and fats," the MFDS said.

It was reported in June that vegetable oil was found in products claimed to be 100 per cent krill oil. According to CODEX, krill oil should be derived from the Euphausia superba, and should also comply with a specific set of acid and peroxide values if the phospholipid concentration is 30 per cent or more.

The MFDS will also set up a test method to confirm the types of fatty acids and amounts of phospholipids present in krill oil, namely the nuclear magnetic resonance (NMR) method and High-performance liquid chromatography (HPLC) method. At the moment, the country is using the acetone insoluble method to analyse the phospholipid concentration in krill oil, which the MFDS said suffered from low reproducibility.

REGULATORY NEVS

UK to lead Europe-wide sugar and calorie reduction network 14 Sep 2021 Nutrition Insight

The World Health Organization (WHO) has chosen the UK to lead a new Sugar and Calorie Reduction Network to reduce sugar and calorie intake across Europe.

obesity. The network will launch

next spring and will invite around

Europe region, which covers a wider

50 countries within the WHO's

"We will work closely with our

European partners to challenge the

food industry to reduce sugar and

reach than the European

Commission's remit.

calories in its products – reducing obesity, relieving pressure on health services and increasing our resilience to COVID-19 and any future pandemics," says Sajid Javid, health and social care secretary. "It's a testament to the success of our work in the UK to help people eat more healthily that we have been chosen to lead this program," he adds.

Work will take place with the food and drink industry to reduce products high in fat, salt and sugar (HFSS), helping to tackle global rates of



The network's member states will share learning and technical expertise to encourage manufacture rs to

reformulate products by cutting the amount of sugar, and therefore calories, in food and drinks to ensure they are healthier.

Building on mixed successes

The network will support both the UK government's existing commitments to the sugar and calorie reduction programs and its global Tackling Obesity strategy, published last year. These programs challenge the food industry across the UK to reduce the sugar and calorie in foods most commonly consumed by children. The UK will leverage its expertise in domestic sugar and calorie reduction to support its European neighbours.

The UK has seen good progress in some sectors, such as sugar reduction. Sugar in the UK has been reduced by 13 percent in breakfast cereals, yogurts and fromage frais. Sugar intake from soft drinks also dropped by 10 percent in the UK one year after the soft drinks industry levy was put into place. However, other F&B areas have faced criticism for falling short of healthier targets, with a report last October stating that sugar was reduced by only 3 percent in the main products that contribute most to UK children's sugar intake.



In its continued efforts, the UK's Department of Health and Social Care's new Office for Health Improvement and Disparities – launching on October 1 – will lead national efforts to improve and level up the health of the nation by tackling obesity, helping improve mental health and promoting physical activity.



Collective approach

The UK's network leadership puts into action its "Global Britain" ambitions, with the UK working with member states to drive forward collective action to influence both Europe and the world in tackling obesity. In a global market where food is increasingly supplied by the same international companies, collective action on reducing sugar and calories will galvanize the food industry to take greater and faster action.

"Obesity is a global problem, and we need to take urgent action to help people live healthier lives. This starts with the food and drink we consume and reducing the elements that are bad for our health," says Jo Churchill, public health minister. A report by the Institute for Public Policy Research (IPPR) flagged last year that collective action would be needed to prevent childhood obesity.

The pandemic's call

In light of COVID-19's detrimental outcomes on obese individuals, the UK established a raft of measures to reduce extra weight in July last year. "Evidence suggests that people living with obesity are at greater risk of being seriously ill and dying from COVID-19. By taking action to reduce sugar and calories in food and drink, the network will not only address rising rates of global obesity but increase global resilience both to COVID-19 and future pandemics," adds Javid. Edited by Missy Green

'Shackles off': Japan lays out plant-based labelling rules for meat, dairy, egg and seafood alternatives By Pearly Neo 03-Nov-2021- Food Navigator Asia

Japan has laid out regulations for the labelling of plant-based products, with observers suggesting they are industryfriendly and should not pose problems for brands.

The plant-based industry in Japan has been seeing quite some growth in recent years, with most progress

being seen in restaurants experimenting with new menus, bigger conventional meat product manufacturers such as Nippon Ham and Ito Ham

launching plant-based alternatives, as well as a few dedicated firms such as NEXT Meats having come into the picture.

However, the government appears unsatisfied with the industry's rate of progress so far, and has thus implemented new labelling rules to govern the plant-based sector in hopes that this will propel its growth.

"The fact that Japan has until now not discussed the food labelling [of plantbased foods] has been a shackle for corporate business



development," Kono Taro, Public Relations Chief of Japan's ruling faction the Liberal Democratic Party announced in a recent press conference.

"The plant-based market is expected to reach about US\$140bn in sales by 2029, [so Japan needs] to take the shackles off. This is why we have created a Q&A document regarding the labelling rules of plant-based foods for all relevant companies."

The document covers plant-based meat, dairy, egg and seafood alternative products, and appears to take an industry-friendly approach,

allowing the use of terms such as 'soy-based meat' or 'oat milk' in plantbased labelling as long as the label makes it clear that the product is not animal-based.

"Labelling will not be a problem as long as the expressions and terms

used are not misleading – so for products made from soybeans, as long as the words 'soy' and 'meat' are written together, there should be no problem," said Kono.

"A disclaimer such as the term '100% plant-based' should also be used, but when using this it must be confirmed that all the ingredients used are derived from plants, including any food additives."





Other accept able disclai mer terms includ

e 'Soybeans are used', 'Meat is not used', 'This is not a milk or milk drink', 'Not a dairy product', 'No fish used' and so on.

"Disclaimers are particularly important and compulsory if a product name is more ambiguous, such as 'Next Cheese' or 'New Butter', as even though these are not animal-based dairy products, the general consumer might not be able to tell this from the label if no disclaimer is added," added the document.

Most manufacturers appear to already be in a good place with their labels based on these regulations.

NEXT Meats, which is one of Japan's leading dedicated plantbased product developers, has launched a number of plant-based products from gyudon (beef rice) to yakiniku (grilled meat) and is planning a tuna launch in December, and all its product packaging already carry the '100% plant-based' disclaimer alongside the NEXT product name.

It should come as no surprise that the government is supportive of the plant-based industry, given how rapidly it is growing in Japan.

"The plant-based trend is gaining more traction in Japan, likely due to consumers wanting to seek out healthier food alternatives after COVID-19, with a higher guarantee of food safety," NEXT Meats PR and marketing director Yuya Makino said. "What we are doing [in response to this] is to position ourselves as an alternative to local dishes and not so much western foods, so our portfolio [is focused on products such as] Yakiniku and Gyudon as opposed to sausages or burgers."

Nippon Ham, under the company NH Foods, is also all set with its plant-based NatuMeat – this uses the 'Soybeans are used' disclaimer; whereas Kewpie's egg-free mayonnaise 'Egg Care' carries the disclaimer 'Does not use eggs'.

Japanese plant-based manufacturers should count themselves lucky in terms of the labelling regulations being accepting of traditional meat and dairy terms, which removes any potential concerns over having to change or reprint labels, or worse yet, find new names for their companies.

The industry in several other countries have not been as lucky – In India, the government recently attempted to ban the use of all dairy terms for plant-based dairy products, leaving firms in a quandary. This has since been stayed by an industry-led court order, but the future of labelling regulations for the plant-based dairy industry remains uncertain.

In Australia, a similar debate regarding both meat and dairy alternative labelling is also still ongoing, with the government appearing to be less sympathetic to the industry compared to in Japan, likely due to the strong traditional meat and dairy influence on its economy.

Thus far, one of the countries in which plant-based labelling appears to have fared the best is China, which approved a very industryfriendly set of labelling standards late last year allowing the use of all conventional meat and dairy terms.





Food safety first: China issues guidelines for near-expired foods after anti-waste law boosts sales By Pearly Neo 06-Oct-2021- Food Navigator

Asia The Chinese government has published formal food safety and consumption guidelines for

products nearing their expiry dates, after a recentlyimplemented anti-food waste law increased sales.

Near-expired foods are generally pre-packaged foods which are close to but have not exceeded their expiry dates. Chinese consumers have shown rising interest in these products due to the associated cheaper price promotions and offers, particularly in supermarkets where sometimes whole counters are set up dedicated to the sales of nearexpired foods.

China's National People's Congress Standing Committee passed an anti-food waste law in congress earlier this year in April. Near-



expired foods both fit the ideology of this policy, and are generally lower in price, so following the passing of this law, these products saw a boost in popularity locally, leading local authorities to develop specific consumption guidelines for these to prevent food safety incidents.



"Near-expired food is favoured by many consumers due to their lower pricing [so] we have developed these guidelines to give consumers better understanding and consumption practices of these [based on] scientific principles," said China's State Administration for Market Regulation (SAMR) via a formal statement.

"These foods are safe under normal circumstances [as these are protected by] both the local Food Safety Law and Anti-Food Waste Law. The Food Safety Law stipulates that all pre-packaged foods need to indicate the production date, shelf life and expiry date. On the other hand, the Anti-Food Safety Law mandates the sellers of these foods such as supermarkets and shopping malls to strengthen daily inspections of food

products and segregate those close to expiry with special labelling or centralised display and sales."

The ministry urged consumers to stick to formal, licensed retail outlets such as branded

supermarkets when looking to purchase near-expired items in order to reduce the risk of food safety incidents. "When attempting to purchase these food products, it is important to examine the packaging closely to ensure there is not damage, unnatural bloating of the bag, leakage of air indicating a

hole and so on," it said. "Close attention must be paid to the production and expiration date to ensure the product is near-expiry but not yet expired, and all violations of this must be reported to the authorities. Similarly, if the food products are not stored under the conditions stated on the label e.g. not refrigerated if required, consumers must avoid buying these and make the relevant reports."

Another major food safety risk highlighted by the ministry was that due to the low prices, consumers might buy large quantities of these near-expired foods and continue consuming these at home even past their expiry dates, increasing exposure to microbes or toxins from spoilt foods.

"Consumers need to be both scientific and rational when making these purchases – being greedy and buying large amounts due to the cheap prices or discounts is an unwise practice [as it increases] the risk of food safety incidents, as well as

> increases the possibility of increasing food waste further due to having to throw food away due to expiration or spoilage, defeating their initial purpose," said SAMR. "Only with both retailers and consumers behaving rationally and in line with the law can [both sides benefit]from this near-

expired foods arrangement – retailers can sell these at low prices to reduce their losses and their food waste, whereas consumers can enjoy lower prices whilst still having their rights and safety protected."

Near-expired foods are not

completely new to China, especially in supermarkets, but the purchasing of these were previously more common practice for the elderly and much less 'trendy' amongst other age groups. Since China passed its anti-food waste law though, there has been a rising growth in the popularity of these foods, making the purchasing of these a whole new trend even amongst younger consumers - asocial media group dubbed 'I love near-expired food' has gone viral on Chinese social media platform Douban with over 87,000 members and even more observers - most of these younger consumers sharing their experience and know-how to find and buy such foods.



According to research firm iiMedia Research, younger consumers between the age of 26 to 35 now make up some 47.8% of those making near-expired food purchases in China. Apart from its newfound 'trendiness' and high complementation with the anti-food waste law, analysts also postulate that economic needs such as pressure from limited salaries and high rent as well as China's promotion of a frugal culture are also driving the rise of near-expired food sales amongst younger consumers.

