



PFNDAI

# PFNDAI Bulletin

OCT 2019

## FOOD, NUTRITION & SAFETY MAGAZINE

# CAN FSSAI BECOME A WORLD CLASS REGULATOR?

### ALSO INSIDE

**Food &  
Mood**

**Beet Fibre –  
Its Potential in  
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**Responding to the  
Draft Regulation:  
Labelling and Display**

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2nd Floor, Mahalaxmi Chambers, 22 Bhulabhai Desai Rd., Mumbai - 26 (India)

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Email: [pfndai@pfndai.org](mailto:pfndai@pfndai.org) Website: [www.pfndai.org](http://www.pfndai.org)

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# EDITORIAL

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Recently, there was a post on one of FSSAI's social media pages, asking people to shun "Junk Foods". We must realise that even the high court have been saying that we should not call any food "junk food" as every food has nutrient and it is not refuse or junk. That is why we started calling certain foods HFSS or High Fat Sugar & Salt Foods.

Fat, sugar and sodium are all nutrients. They may be in excess in some foods and would be undesirable if consumed in excess. However, we should not follow the populist trend of sensationalising the issues by using some ridiculous names for foods.

Just a while ago, one American scientist called coconut oil "poison". Just because it has high content of saturated fat does not give anyone liberty to call it "poison". We should restrain ourselves from using such terms to describe foods and products which are consumed by a large number of people.

Humans, unlike animals, prefer to have variety in their diets so they would not like to eat food which is identical and perfect in nutrient composition. We could have one type of food which has 100% RDA of all nutrients and have same taste and flavour in every bite in every meal. That is what we feed our pet animals - with pet foods - which has everything that they need in exactly the same proportion. We are different, so we need something sweet, something salty and

something very satisfyingly smooth. We also need something spicy and something tangy and sour. But, overall diet should contain all the nutrients in proper proportions.

We eat rice which is high in carbs with dal, which is higher in proteins and dietary fibre. Together they give a balance but we should not insist that we eat khichdi with rice cooked together with dals. People may want to eat roti instead of rice and meat or egg for protein. Different combinations make the diet interesting. Still we should caution them not to overindulge in fat, sugar and salt. But calling the foods containing high amounts of these "junk" is not acceptable even to judges in courts. So although we should enthusiastically promote balanced and healthy diet, we also should not try to sensationalise our campaign.

Some of our food for cultural and religious practices may contain high fat and sugar but we do not call them "junk". We should be sensitive to peoples' sensibilities, especially those in authority should be more careful.

Prof Jagadish Pai,  
Executive Director,  
PFNDI



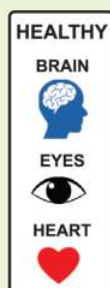
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# CAN FSSAI BECOME A WORLD CLASS REGULATOR?



AUTHOR

Dr P. I. Suvrathan,  
Former Chairperson,  
Food Safety & Standards  
Authority of India

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It is ten years since Food Safety and Standards Authority of India, the nation's food safety regulator, was established.

It is perhaps time to take stock of the entire initiative of food safety regulation in the country keeping in view the original objectives of the law and our own experience of the last decade. Such reviews have been undertaken by several food safety regulators in other countries such as the UK, USA, Ireland, Australia etc. which have built up reputations as world class regulators whose regulatory performance has become best practice in the field. Such reviews have led to a better appreciation of the issues in food safety, developing new options to be considered, building on successes and making mid course corrections, in line with developments in science, economy and society.

Here we propose benchmarking the performance of FSSAI keeping in view the best practices elsewhere,

emerging issues in food safety and the potential and likelihood for changes in the years ahead. What steps need to be taken to develop FSSAI as a centre of excellence in food safety? Since the country expects that in line with international best practices, FSSAI should now emerge as a world class regulator, which areas need to be emphasized and practices followed?

FSSA Act 2006 lays down the objectives as follows:

“Consolidate the laws relating to food; establish the Food Safety and Standards Authority of India, laying down science based standards for articles of food, sale and import, ensure the availability of safe and wholesome food for human consumption.”

FSSAI has now been established, the basic rules and regulations notified and the beginnings made to appoint regulatory personnel in the Centre and the states. Three Chairpersons have changed hands and there is now more clarity in the regulatory ambit of the FSSAI and

its limitations. To be considered as a world class food safety regulator, FSSAI should be in a position to deliver excellence in its end to end chain of operations covering design, consultation, implementation, enforcement, effective regulatory impact, evaluation and feedback. FSSAI should create a catalogue/array of skills necessary for excellence; bring them together from within the organization and outside, including the Government which is the major stakeholder, consumer, industry, regulatory experts, scientists and state govts so that the various issues and ideas can be discussed and a feasible course of action developed for ensuring the emergence of FSSAI as a world class regulator.

## Principles of Good Regulation

Before we look at the regulatory options available in the food safety sector, it would be necessary to clarify the basic principles of good regulation as they have evolved worldwide and keeping in view the conditions in India's food sector.



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## AAK KAMANI

The Value Adding Partnership  
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It has now been well recognized that good regulation should be effective, proportionate, accountable, consistent, transparent and targeted. There is no point in building a regulatory apparatus which is disproportionate to the importance and peculiarities of India's food sector.

The regulatory system should help in the healthy development of the sector, promoting investment, consumer safety and employment. The actions of the regulator should be consistent across the country and various subsectors, adhering to the principles of fairness and justice.

Each decision should be based on scientific evidence and best practice. Every consumer and food business operator has the right to be treated fairly, according to declared principles, and applied uniformly, subject to individual peculiarities.

The procedures followed need to be transparent, so that stakeholders know how FSSAI has arrived at the decision and can expect similar decisions about similar issues in the future also, thereby facilitating orderly investment decisions. It is

important that the regulatory action should be well targeted, so that similar entities are treated similarly and unnecessary interventions which hinder and distort economic decisions by individuals are avoided.

### World Class Regulation

The following could be the characteristics of such a

world class regulator keeping in view the experience of other developed countries:

FSSAI should be well aware of the realities of running a food business in the country, the points at which it needs to intervene and the constraints which need to be reduced.

### A Responsive Organization

FSSAI needs to be in a position to develop a consistent understanding of the characteristics of market failure, so that it can intervene to protect consumers where the market is not balanced, effective, or does not provide proper levels of protection. There may be many areas where no intervention is required, or where just the provision of complete information may serve to address the issues.

Highlighting the metrics which indicate safety levels by itself could incentivise stakeholders to act and correct the distortions. Awareness is the single most important factor which can increase the effectiveness of regulatory action and empower the consumer. The so called Dracula Principle says, "Throw light on problems and they often go away."

For this to happen, FSSAI needs to

become a porous organization and a good listener, open to external ideas, and external assessments of its own performance. Food safety control should be predictive and hence preventive, not reactive, as with the previous adulteration Act. Only then can the regulator learn from others, keeping touch with the current scientific opinion and determine its own position relative to other regulators.

FSSAI operates in an environment which has many state and non state players, each with its own capabilities, roles and mandates. It thus becomes necessary that FSSAI develops the skills for working in association with these entities, be they consumers, governments or organizations. There may be approaches and ideas which have been successful in other sectors and could be useful in food safety.

### A Data centric organization

For FSSAI to be a world class regulator it needs to be a data centric organization, capable of identifying and monitoring the metrics by which its own effectiveness can be evaluated. In many countries, the incidence of food borne diseases is recognized as a critical metric to evaluate the performance of the food safety regulator. FSA in UK commits itself to reduce the incidence of food borne diseases in the UK by 20% in the next few years.

We need to move towards such a focus in our food safety regulation. FSSAI should be able to indicate a figure for incidence of food borne diseases by continually accessing and analysing the breakup of this data and the locations and sources of hazards. Otherwise there is a risk that its efforts may be frittered away in a multitude of ventures all of which produce much publicity, but deliver little impact which is measurable. It is also essential to anticipate emerging risks so that sudden emergencies do not catch the regulator unawares.



### A Framework for Evaluation

Based on the practices followed by other world class regulators, it would be possible to identify the following issues which need to be addressed by FSSAI in an ongoing manner. These would also help to identify the criteria for becoming a world class food safety regulator:

1. Is FSSAI able to deliver outcomes and regulatory action effectively? What are the specific regulatory steps it has taken in the preceding year and how effective have they been? Do we have measurable outcomes?

2. Has FSSAI adopted a risk based, proportionate response in such cases? What is the array of skills developed by FSSAI in the exercise of its functions? Do its personnel match the required skills?

3. It is essential that FSSAI becomes a learning organization to match the fast pace of technology and science. What steps are in position to ensure that the best of science and regulatory expertise is available to FSSAI?

4. Are the actions taken by FSSAI proportionate, science based and economical? What partnerships have been developed by FSSAI in the pursuit of its objectives? How has FSSAI leveraged the capabilities of its partners in setting its regulatory agenda?

5. What mechanisms are in place to obtain feedback on the steps taken? How are the responses used in refining further regulatory action?

6. How quickly does FSSAI respond to food safety events and how calibrated are the responses? Does FSSAI draw appropriate lessons from each episode so that they are not repeated? Do these events get recorded in the institutional memory to be refreshed and accessed whenever required?

7. Does FSSAI have a surveillance

mechanism in place which monitors the developments within the country and abroad so that it can respond quickly and develop appropriate scientific analyses of the issues involved? Such surveillance will have to tap into the mass of data being collected by a variety of organizations such as local bodies, health institutions, educational bodies, immigration channels and customs. Does FSSAI generate periodic reports on the state of food safety in the country and the states, as well as various sub-sectors?

8. What specific steps have been taken by FSSAI to build the best scientific expertise into its decision making processes? Are adequate scientific and regulatory skills being built within FSSAI?

### Metrics for Evaluation

The following would be the first cut of the performance criteria on which data need to be collected and analysed by FSSAI to evaluate its own performance. This would also be required for the Government and Parliament to evaluate the effectiveness of the regulator vis a vis the original objectives of the food safety law. For example, proportionate measures require an assessment of the regulatory impact and the cost of implementation by government and industry as a consequence of a new regulation.

a. The level and trend of food borne diseases, indicating the effectiveness of FSSAI in regulating the safety of food and controlling the hazards involved.

b. Levels of salt and trans fat in food across the country, indicating the change in risk levels for food borne illnesses or public health such as heart disease, diabetes etc.

c. Safety levels of drinking water in various towns and villages, clearly identifying the safety of the most

critical input in food preparation.

d. Extent of registration and licensing of food businesses, showing the extent to which food businesses have been brought under the regulatory fold.

e. Safety and nutritive status of school meals, identifying the potential for safety hazards in school meals and its wide impact.

f. How effective are regulations of imported food being enforced?

g. What is the risk assessment capability of FSSAI and how does it compare with other world class regulators? How well equipped is FSSAI with scientific and regulatory skills to perform its functions at high levels of reliability?

In the absence of risk assessment FSSAI will be spending its limited resources of skills and funds on issues of peripheral but less critical importance for food safety.

h. Has FSSAI developed its own inspection protocol and trained its personnel therein? How effective are the sampling designs to ensure that they are representative?

i. What is the status of the laboratory upgradation work and its reliability to assist in enforcement? Food testing labs not only enable reliable and prompt regulatory action but highlight the changing trends and status of food safety in the country.



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# FSSC 22000 FOCUS DAY

## INDIA & SOUTH ASIA - 11 NOVEMBER 2019

### TAJ SANTACRUZ - MUMBAI, INDIA



This one-day event will be held on November 11, 2019 at Taj Santacruz, Mumbai, India. The 2019 Focus Day Event will provide a firsthand update of the global FSSC 22000 certification program including new Version 5. The FSSC 22000 senior leaders will share an overview of the benefits of the ISO approach, the revised ISO 22000:2018 and its alignment with FSMA. In addition, new FSSC 22000 scopes, including Transport, Storage, Catering and Retail will be discussed with a practical example. This event is especially interesting for food safety professionals and senior leaders of organizations who are engaged in any part of food supply chain.

#### More information and registration:

<http://afstimumbai.org/newafstimumbai/event2019afsti/index.html>

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j. What arrangements have been put in place by FSSAI to impart high quality training to regulatory staff, both central and state? In the absence of uniform inspection protocols, regulations will be following disparate standards, making uniformity of implementation difficult.

k. Has a framework been developed for accreditation and certification of food safety and how it is proposed to be taken forward? In the absence of unlimited regulatory staff, certification is the internationally accepted way to extend the impact of regulation to a wider area and encourage self compliance.

l. Has FSSAI developed a framework for working with and evaluating local authorities, strengthening them wherever necessary? Food Standards Agency, UK has developed a Local Area Framework laying down guidelines and benchmarking the performance of local bodies which are closest to the consumer and food businesses.

m. Has FSSAI built collaborative initiatives with other stakeholders such as consumers, industry and other centres of excellence in science? What are the specific outcomes achieved?

n. Is FSSAI accessing data already available with the government, such as disease profile, sampling data available from food safety labs, the medical statistics system in the country and using them in the development of regulatory steps?

o. Is development of standards preceded by risk assessment as

required in law? Do scientific panels and Committee carry out the scientific analysis of such reports to be prepared by the Secretariat of the Authority before they provide scientific advice? This is essential to ensure that regulatory decisions are taken solely by the Authority and is not passed on to the Panels/Committee for rubber stamping. Only then will science become the driving force of regulatory action. It is also necessary to separate risk assessment from risk management, to ensure integrity of the process.

p. What arrangements have been put in place for ensuring traceability of food so that the sources of contamination are quickly identified and corrective action taken?

Evaluating states and local bodies  
Similar metrics can be developed for evaluating the performance of states in food safety and encouraging a process of virtuous competition and collaboration such as the one used in rolling out Goods and Services Tax. The following would be some of the benchmarks which can be used for this purpose.

1. Percentage of food businesses brought under the licensing/registration regime, indicating the coverage of regulation.
2. Presence of E. coli, suspended matters, pathogens etc. in drinking water, including water supply agencies both public and private.
3. Safety standards of the restaurant industry based on periodic inspection. Does the state regulator maintain records of such inspections?
4. Number of risk based inspections

, sector wise, with the results available

5. Water sources protected, treatment protocols in place and distribution lines upgraded( This would involve collaboration with other departments of govt)
6. Waste disposal arrangements by local bodies, food businesses and households(again involving collaborative arrangements)
7. Safety and nutrition standards of school meals.
8. Has the Food Safety Commissioner of the state brought out a State Of Food Safety Report for the state? Are these available to public?
9. Presence of chemicals in farm produce being marketed, and the number of samples taken.
10. Abattoirs inspected and found adequate.
11. Imported foods inspected at the borders.
12. Training imparted to staff and the specific skills built, enabling uniform standards of inspection.

The outcome of such an evaluation could be the basis for the review to be undertaken by Parliamentary Committees of the performance of the staff and members of the Authority. This would bring much needed accountability and outcome based monitoring that the national food safety regulator requires for establishing its credibility and value for money. Such a road map will enable clear monitoring of the food safety regulator and its progress towards becoming a world class regulator. In its absence, the nation runs the risk of reverting to the earlier 'control and punish' mindset that governed the PFA law which was replaced by the current one.

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# FOOD & MOOD



AUTHOR  
Dr Prabodh S Halde,  
Head,  
Technical Regulatory,  
Marico Ltd

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Why are some people so cool? During office or personal association we find that some people are very calm at all times and they are always energetic. Today every organisation would like to have more people who can manage higher stress levels and lead people effectively.

On an average we eat 4 times a day and also drink some beverages including tea/coffee/milk/juices or other traditional beverages minimum 4-5 times a day. No doubt food has a crucial impact on our mood so let's see what exactly the science behind mood theory is.

## What is the meaning of mood?

Mood is considered as an emotional state and may be defined as one's mental status of thinking and behaviour in a healthy, normal individual. So what is a 'good mood'? You can be said to have a positive mood when you have a clean slate, no tiredness, feel no stress in life and have a smile on your face. Such people are more popular since everyone wants to associate with such personalities. Bad mood is about feeling irritable or short-tempered or having some kind of depression. It also includes

feelings of boredom or hopelessness, impatience, anger, or even just not caring and no empathy. No one wants to be associated with such people and generally it's a temporary state of mind.

## Science behind the Food & Mood

Once we eat food, it gives us energy and also produces neurotransmitters in the brain which impact our body, mind and emotions. As per modern science, there are 43 types of neurotransmitters produced in the brain when we have food - some are good and some are bad.

Some neurotransmitters stimulate nerve reactions creating excitement, motor movement and higher thinking, promoting alertness, energy and activity. Hormonal compounds responsible for these changes are dopamine, oxytocin, serotonin and endorphins. So food which increases such hormones can be called as good mood food. Some neurotransmitters stimulate sadness, depression, loneliness and fear. The hormonal compounds of this category are: GABA (gamma amino butyric

acid), acetylcholine, taurine, adrenaline, cortisol, etc.

Extensive studies are being carried out in India and abroad to analyse which are the exact food categories responsible for creating good or bad moods. However, results are not so conclusive since food alone is not the only reason for mood creation but there are many other factors responsible like portion size, quantity, eating time, exercise, emotional balance, etc.

Still, we know some broad categories of food which create a good mood such as green leafy vegetables, fruits, adequate supply of sugars (thus chocolate and ice cream make you feel happy but not in excess), protein, Omega 3, Omega 6, DHA, Pro & Pre biotic foods, vitamins and minerals - overall balanced diets.

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Food categories which create a bad mood when taken in excess are tobacco, alcohol, red meat, excess sugar and fat and excess spices.

Inadequate intake of vitamins and minerals is also a factor for bad moods. Low insulin production also increases the above 'bad' hormones and increases stress in the body.

Modern science is doing extensive research in this area and in the future we may get readymade tablets

and thus there are concepts like fasting (in all religions), healthy eating, restriction on some diets, Satvik food concepts, etc.

In Indian tradition we call food as brahma

जविनकरजिवित्तिवा अन्नहैपूरणब्रह्म  
उदरभरणनोहैजाणजियज्जकर्म॥

So eating is not a simple thing - it's 'Yadnakarma', it's a ritual, so never

for good moods or mood controller pills. Even our ancient Indian traditions have understood this science

eat in a hurry or when in a bad mood. It's an important activity of life.

Hence, to increase one's productivity, mood is very important and in today's fast life emotional wellbeing is also important to keep your relationships working.

Hence it is advisable to have better control on your food habits not only for physical wellbeing but also for emotional and balanced mental health.

Considering the importance of this, even FSSAI has launched the 'Eat Right' program and the 'Eat Right' concept is not limited to physical wellbeing but also to the mental and emotional wellbeing of humans. No doubt, future food trends will be based on good mood food and let's wait for more products to hit the market.

## COMING EVENTS

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W: www.refcoldindia.com

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# DELICIOUS SOYA CUISINES TO DEFEAT PROTEIN DEFICIENCY

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Nutritional Fibres, Unipektin  
(Erik Hansson - Unipektin  
email: lasse.hmv@gmail.com)



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Vegetarian dishes have stepped forward the past years as an alternative to animal meat products. However, vegetables lose some of the nutritional juice when fried. New tests show a low amount of fibre, in this case Beet fibre, can assist to improve texture and reduce frying loss

Indications from literature and food ingredient declarations showed beet fibre could work well within those products – this made us curious to find out more.

Beet fibre is produced from sugar beets after the sugar has been extracted. It has a mix of insoluble and soluble fibre, the insoluble part is hemi cellulose and cellulose and the soluble part pectin.

This fibre contains some protein and is free from gluten and allergens, it is free from phytic acid, which could act as mineral blocker. The composition is rather unique in the fibre world which made it perform well in clinical studies and has approved EFSA/EC Health claims.

### Functional benefits in food products

One of the key components in beet fibre is the mentioned fibre mix, the insoluble part mainly holds water and the soluble pectin partly gels and add binding properties in various applications. Its non-lignified structure keeps the water inside the cell structure (left illustration) while lignified fibre holds water on the surface (right). It is a heat/freeze and thaw stable fibre.



### Including Beet fibre in Vegetarian food

A study in vegetarian & vegan mini

burgers showed a reduction in frying loss from 17% in the control to 9% in the ones with 3% Beet fibre added, even if some extra water was added to the one with Beet fibre as the mix was drier than the control when forming the burgers.

Products from this test; base of yellow peas, carrots and onions





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corn starch. A similar burger batch was made, but here with an addition of a few percent beet fibre and Carob protein respectively. Frying loss was reduced from 13% in the control to 8.3% in the one with added fibre and protein. A good synergy between plant protein and beet fibre was shown, giving this burger a firmer texture and more “meat like” colour inside.

The conclusion is that a vegetarian dish with more of its nutritional juice left and with added healthy fibre and protein is beneficial from a nutritional standpoint. Functionality is an extra bonus for both consumers and producers.

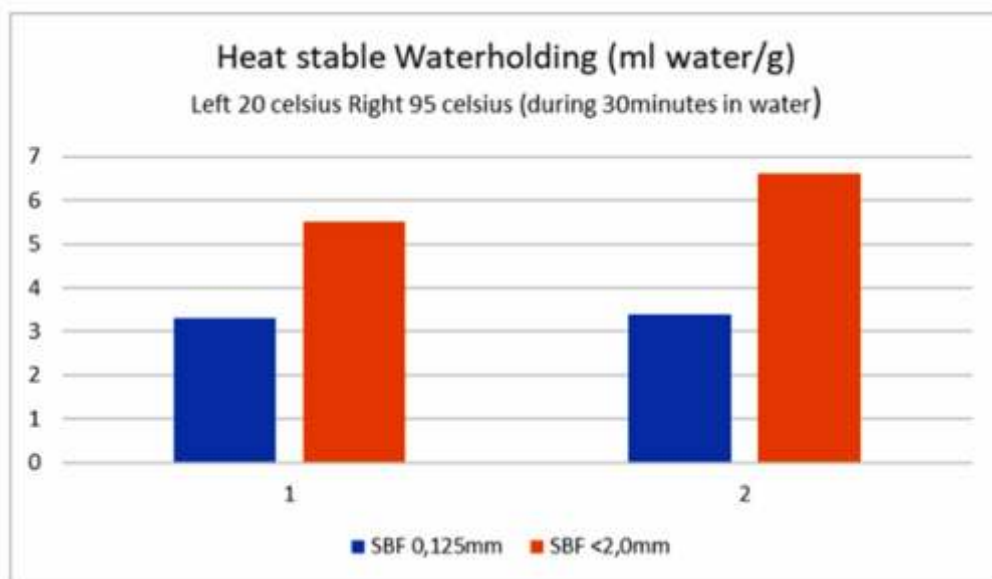
According to the “Handbook of dietary fibre” and “Food applications and benefits of dietary fiber”, Beet fibre is included in several nutritional and functional studies over the years, making it one of the most well documented dietary fibres.

The Vegetarian/Vegan product with added Beet fibre was perceived as firmer both before and after frying by the taste panel, also holding together better and felt juicier due to more moisture left in the product. It was noted that the slight off-white color of beet fibre made it invisible in the product.

We took it one step further with another study which confirmed the results above. Carrots, red beets, corn, white beans, yellow peas and onions were mixed briefly in a cutter and founded base for 100-gram burgers together with a small addition of spices and



Burger with added fibre/protein on the left, control to the right



Process stability, heated Beet fibre increased its water holding when heated compared to when in room temperature, especially the coarser particle size. Lignified fibres didn't show the same trend.

# RESPONDING TO THE DRAFT REGULATION: LABELLING AND DISPLAY



**AUTHOR -**  
Dr J I Lewis,  
Vice Chairman,  
Regulatory Affairs Committee,  
PFNDIA



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When responding to a labelling draft, it is essential to lay down guidelines for deliberations for stakeholders to express their concerns and issues in a lucid way.

Deliberations among other things involve a process of careful examination of the issue, use of logic, reason, and reference, as opposed to power struggles, influence, opinions and innuendo. Borrowed texts, before placement in drafts deserve diligent scrutiny or they run the risk of being irrelevant when placed out of context. It is not uncommon that interpretations of law arise because of inappropriate arrangements of clauses or contradictions with others in force. For primary stakeholders who implement (FBO) or enforce (FSO) the regulation, if the law is unclear, the first compliance hurdle occurs.

When deliberations take place they should be based on a template of 'checklists'. A simple comment to check 'the organization' of the regulation or clause brings into focus that its placement (contextual) is inappropriate, confusing, and vague. Similarly a comment on 'flow of the conditions' (who, what,

where etc.) helps check if all these appear in a logical sequence. Some of the guidelines that should be

adopted in responding to drafts are shown in (Fig.1, 2).

**Fig.1: Overview of regulatory texts**

- |                        |   |
|------------------------|---|
| ➤ Structural (S)       | Organizing the regulations/sub-reg.             |
| ➤ Flow (F)             | Arranging clauses logically                     |
| ➤ Applicability (A)    | Reproducing or adopting clauses from            |
| ➤ intra -regulations : | Food Safety and Standards                       |
| ➤ inter- regulations:  | Legal Metrology, other, including international |
| ➤ Error (E)            | Grammatical, editorial                          |

**Fig.2 Labelling: a matter of knowing**

- |                                  |                                 |
|----------------------------------|---------------------------------|
| • What is to be declared ...     | name of food, ingredient list   |
| • When is it to be declared ...  | triggers, conditions            |
| • Where is it to be declared ... | place on label (e.g. PDP)       |
| • How is it to be declared ...   | size of letter, capitals, boxed |
| • Why is it to be declared ...   | reason and purpose.             |



### 1. Organization:

• In revising the Food Safety and Standards (Packaging and Labelling) Regulations 2011, the draft has made a simple and welcome organization of provisions in four chapters. Each chapter is devoted to a specified trading entity or domain of sale (e.g. pre-packaged, non-retail sale, food service establishments) and other articles of food (food additives). This separation will help FBO's and FSO's to navigate through the document and quickly find regulatory texts of interest or reference.

Following up on organizing regulatory topics under distinctive chapters a recommendation is to extend the same to sub-regulation 8 (Display of Information in food service establishments), under Chapter 2. It does not belong to chapter 2; a separate chapter is required (Fig 3).

A second suggestion would be to address the labelling provisions to the sales domain namely "retail

this is in addition to the information being provided in a tabular form, introduced around 2005. Points to be noted:

Most countries mandate the tabular form of declaration only and the graphic illustration is optional. The draft mandates both declarations.

Both (tabular and graphic representations) are declarations on nutrition information and should be placed together under sub-regulation 4.2. (3), in two parts. The draft incorrectly places this under sub-regulation 5. (4)(c), which deals with the principal display panel. These are two completely different regulatory topics.

Perhaps the drafting should have taken cognizance of the arrangement for declaring the Vegetarian- Non Vegetarian logo; it is given under sub-regulation 4.2. (4), even though it is required to be displayed on the PDP. There is a



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Charday Penn

logic here, which has been overlooked.

### 3. Applicability: is the regulation principle harmonized with global practice

• Often regulations are adopted clauses and texts from international sources. Harmonization – an oft-misused term- requires understanding beyond mere 'borrowing' or 'adopting'. Contextual relevance is the key to adoption.

Food is defined in the Act like all regulations worldwide; nowhere is there a definition of "HFSS foods". Under the claims regulation Food Safety and Standards (Advertisement and Claims) 2018, foods can be claimed to be high or low (nutrient content) subject to certain conditions. The micronutrients have a benchmark namely the recommended daily allowance (RDA); so also foods high or low in macronutrients (fat, salt, sugar) follow a benchmark such as "daily value" (US) or "reference intake" (EU). The table in Fig. 4 elucidates the understanding of harmonization and alignment with best global practices

Fig 3. Chapters: Food labelling

Draft	Suggestion
1. General	1. General
2. Labelling (Pre-packaged)	2. Labelling (Pre-packaged retail sale)
3. Labelling (Non retail container)	3. Labelling (Non retail sale)
4. Labelling (Food additives sold as such_	4. Labelling (Display Food Service Establishment)
	5. Labelling (Food additives sold as such

sale" and "non retail sale"; not the 'container or package' (sub-regulation 2. (1). 14); the latter is a variable and can cause difficulties in implementation.

When treated separately as suggested (Fig.3) labelling requirements are clear for each trading entity.

• The draft introduces a new declaration on nutrition information through a graphic representation;

Fig. 4: Consumer information as a percent of

Nutrient	% Energy	Draft (LD) 2019	Reference Intake	% Daily Value
Energy	-	2000	2000	2000
Total Fat	30	67	70	65
Saturated Fat	10	22	20	20
Trans Fat	1	2	-	-
Sugar	10	50	90	-
Sodium (mg) or Salt (g)	-	2000	6 salt	2400

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The 2000 kcal energy intake is stated only for the purpose of nutrition labelling declarations and does not represent a dietary recommendation, as individuals may vary in their energy intakes. It is intended to assist consumers in making choices or in consuming less of a food high in certain nutrients. For example, if the graphic nutrition information on the PDP says one serving of the food contains 2.2g of saturated fat, which is 10% of DV (22g), consumers understand 90% is available for consumption during the day.

It is apparent that HFSS is based on a principle similar to the Daily Value or Reference Intake. In the interest of harmonization and

defined regulatory term); the term Front of Pack is not and using two expressions meaning the same thing leads to confusion. Use the regulatory defined term.

• Principal Display Panel (PDP) is another case of 'borrowing' or 'adopting' texts without contextual relevance. The definition of PDP is given in the draft under clause 2. (1). 19; its definition remains the same for past 20 years - or more - and is aligned with global practice. The definition of PDP by Legal Metrology (Packaged Commodity) Rules 2011: 2(h) is different. A careful reading makes it clear that in the case of food, the PDP is 'that part of the label . . . ' while Legal Metrology

global practice it is recommended that India too adopt a similar definition.

Whenever nutrition information in a graphic form is required, it is placed on the PDP (a

defines PDP as "the whole surface area"... (Fig. 5).

The difference in definition makes it clear that the condition of "the information required under these regulations shall be given on the PDP" cannot be complied with when the PDP is defined as "that part of the container/package". However, under Legal metrology "the information required under these rules" can be given on the PDP when it means the total surface area; with a further condition to group the information so that it is not scattered over the entire package.

The entire food industry – domestic and international - follow the Food Safety and Standards definition of PDP.

Under the draft regulations the declarations required on the PDP are:

- Name of food;
- Net quantity (implied by the provision of a table relating to minimum height of numerals);
- Veg Non-veg logo
- Nutrition information (graphical form)

Fig.5:Difference in definitions

#### D(LD) 2.1.(19) & FSS(PL) 1.2.1.(9)

"Principal Display Panel" means *that part of the container/package* which is intended or likely to be displayed or presented or shown or examined by the customer under normal and customary conditions of display, sale or purchase of the commodity contained therein

#### LM (PC) R: 2(h)

"Principal display panel" in relation to a package means *the total surface area of the package* where the information required under these rules are to be given in the following manner:

- i. All the information could be grouped together and given at one place; or
- ii. The pre-printed information could be grouped together and given in one place and online information grouped together in other place

4. Organization: arranging sub-regulations and clauses in a logical manner

- As stated earlier Display of information in Food Service Establishments (FSE) provided in sub-regulation 8 of Chapter 2 requires a separate chapter. More than that, the regulation should be arranged logically to facilitate compliance: for example: Who does it apply to: an explanation of what is considered to be a FSE should be given. For example a food service establishment would be an operation located at a particular place that stores, prepares, packages, serves, vends or otherwise provides food for human consumption and is relinquished to the consumer for immediate consumption or through a delivery service. The operation location includes mobile, stationary, temporary or permanent facility or location where consumption is on or off the premises.

Who is included and who is not is to be stated clearly. For example Inclusions:

- FSE's holdings central license with 10 or more locations;
- Sub-regulation 7(4) appears related to FSE as it says "in case of prepared food served for immediate consumption such as hotels or by food service vendors or caterers or halwais or hospitals or at religious gatherings or food served in airline/railways/passenger vehicle or any mobile unit . . . ". This sub-regulation and its proviso should be

deleted from Chapter 2. They are redundant; what they say and mean would fit under the description of an FSE, under a separate chapter.

Exclusions:

- Event caterers and Food Service premises that operate for less than 60 days in a calendar year (consecutively or non-consecutively).
- Self-serve condiments that are free of charge and not listed on the menu.
- Special-order items or modified meals and menu items as per customer's request.

What is to be displayed:

- Nutrition labelling per portion of the food calculated on 2000 kcal daily value;
- Allergens: related to 8 declared foods
- Veg Non-veg logo
- Advisories under Schedule –IV (if applicable)
- Organic ingredients (if claimed)

Where is it to be displayed:

- Menu cards, boards, website, booklets, handouts, table placements, etc.)

FSE's are a new sector of business entering this regulatory compliance for the first time; its compliance requirements should be addressed separately.

In conclusion there is an urgent need to streamline the rulemaking process formalized for time and content of consultations. Discussions should have begun with

preparation of notice published in April 2018 for WTO comments. The Act sets this out in Sec. 18. (2)(d): "ensure that there is open and transparent public consultation, directly or through representative bodies including all levels of panchayats, during the preparation, evaluation and revision of regulations, except where it is of opinion that there is an urgency concerning food safety or public health to make or amend the regulations in which case such consultation may be dispensed with : Provided that such regulations shall be in force for not more than six months;

Stakeholders could have also utilized the time since April 2018 to do several dipstick surveys on frequency of consumption of prepackaged foods and their contribution to daily intakes.

In retrospect it seems that a simpler representation of high fat, salt and sugar as a percent of daily values (DV) or relative intake (RI) would have been more effective communicating with consumers than disparaging packaged foods without evidence that they are major contributors to high intakes of fat, salt and sugar. Moreover giving such foods the harmful connotation HFSS is worse. It is hoped that it is not too late to do the right thing than pursue with what is not.

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# REGULATORY ROUND UP



By  
**Dr. N. Ramasubramanian,**  
VR Food Tech Private Limited  
n.ram@vrfoodtech.com

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Dear Readers

Hope you are all back in action after Diwali celebrations. I have started including "safety" in my Diwali wishes. Please find below the FSSAI announcements since the last round up.

[Latest list of FSSAI approved list of laboratories along with their NABL accreditation and validity.](#)

[Draft standards regarding pollen count in Honey has been operationalized](#)

Standards for Formulated Supplements for Children (above 2 and up to 3 years) was notified in 2018. [FSSAI in its order dated 18 October 2019](#), has directed all products which are targeted at this age group shall comply with the standard and cannot be marketed as a proprietary food. This directive is not applicable if the said product falls under the categories of Foods for Special Dietary Use or Foods for Special Medical Purpose.

[FSSAI has issued guidelines for dairy processing units with regard to scheme of sampling and testing for the purpose of self-monitoring.](#) It lists different dairy products along with the type of tests, frequency, sampling scheme at different stages of processing. Extremely useful for small scale industries with a limited technical man power.

[A report on the national survey conducted to assess the pesticide residues in raw foods like fruits, vegetables, oil seeds, cereals, milk, etc.](#) 23, 660 samples were analysed for pesticide residues. Pesticide residues were detected in 4510 samples (19.1%) and out of which residues in 523 samples (2.2%) were found exceeding the limits set by FSSAI. The results are reassuring.

[A short and precise explanation by FSSAI regarding the interpretation of Appendix A of Food Safety and Standards \(Food Products Standards and Food Additives\) Regulation, 2011.](#) Appendix A is the most important piece of regulation as it lists the permitted additives along

with the levels in different categories of food. A good guideline for the beginners in product development.

[FSSAI in its order dated 11 October 2019 has mandated all imported proprietary foods to be accompanied by certificate of analysis issued by ISO 17025 accredited laboratory.](#) This is made effective from 01 January 2020.

[FSSAI initiates special drive for registration and licensing of food business operators.](#)

[Amendments and clarifications with regard to directions issued in case of non-requirement of FSSAI license for the last mile delivery persons, direct sellers etc.](#)

[Special drive by FSSAI to check compliance of Nutraceutical/Health Supplement products with applicable labelling regulations.](#)

[Draft standards on coconut oil has been operationalized.](#)

# RESEARCH IN HEALTH & NUTRITION

Image © iStock.com/AaronAmat

## Eating nuts linked with lower risk of fatal heart attack and stroke

Science Daily August 31, 2019

Eating nuts at least twice a week is associated with a 17% lower risk of death from cardiovascular disease, according to research presented today at ESC Congress 2019 together with the World Congress of Cardiology.

"Nuts are a good source of unsaturated fat and contain little saturated fat," said study author Dr Noushin Mohammadifard of Isfahan Cardiovascular Research Institute, Iran. "They also have protein, minerals, vitamins, fibre, phytosterols, and polyphenols which benefit heart health. European and US studies have related nuts with cardiovascular protection but there is limited evidence from the Eastern Mediterranean Region."

This study examined the association between nut consumption and the risk of cardiovascular disease and death in the Iranian population. A total of 5,432 adults aged 35 and older with no history of cardiovascular disease were randomly selected from urban and rural areas of the Isfahan, Arak and Najafabad counties. Intake of nuts including walnuts, almonds, pistachios, hazelnuts, and seeds was

assessed in 2001 with a validated food frequency questionnaire.

Participants or family members were interviewed every two years until 2013 for the occurrence of cardiovascular events and death. The specific outcomes investigated were coronary heart disease, stroke, total cardiovascular disease, death from any cause, and death from cardiovascular disease. During a median 12-year follow-up, there were 751 cardiovascular events (594 coronary heart disease and 157 stroke), 179 cardiovascular deaths, and 458 all-cause deaths.

Eating nuts two or more times per week was associated with a 17% lower risk of cardiovascular mortality compared to consuming nuts once every two weeks. The connection was robust even after adjusting for factors that could influence the relationship such as age, sex, education, smoking, and physical activity. Nut intake was inversely associated with the other outcomes but lost significance after adjustment.

ESC guidelines list 30 grams of unsalted nuts per day as one of the characteristics of a healthy diet, while noting that the energy density of nuts is high. "Raw fresh nuts are the healthiest," added Dr Mohammadifard. "Nuts should be fresh because unsaturated fats can

become oxidised in stale nuts, making them harmful. You can tell if nuts are rancid by their paint-like smell and bitter or sour taste."

## New insights into how diet and medication impact the influence of gut bacteria on our health

Science Daily August 30, 2019

Research published in Cell on 29th August by the groups of Filipe Cabreiro from the MRC London Institute of Medical Sciences and Imperial College and Christoph Kaleta from Kiel University in Germany has demonstrated that diet can alter the effectiveness of a type-2 diabetes drug via its action on gut bacteria.

Bacteria that reside in our gastrointestinal tract, referred to as the gut microbiome, produce numerous molecules capable of influencing health and disease.

Image © iStock.com/metamorworks





The function of the gut microbiome is known to be regulated by both diet and drugs such as the drug metformin, which is used to treat type-2 diabetes and has been shown to extend the lifespan of several organisms. However, understanding the complicated, multi-directional relationships between diet, drugs and the gut microbiome represents a considerable challenge.

"Disentangling this network of interactions is of utmost importance since the specific mechanism of action of metformin is still unclear," says Filipe Cabreiro.

#### A new screening technique

Cabreiro and his team developed an innovative four-way high-throughput screening technique to better understand how diet, drugs and the gut microbiome interact to influence host physiology. They used the nematode worm *C. elegans* colonized with the human gut bacteria *E. coli* as a simplified host-microbiome model and exposed it to metformin in the presence of hundreds of different nutritional compounds. They found that metformin treatment altered the metabolism and lifespan of the *C. elegans* host and that these effects could be either enhanced or suppressed by specific nutrients. Crucially, it was revealed that the gut bacteria played a key role in mediating this phenomenon.

The importance of the diet and gut bacteria explain why metformin was previously shown to have no effect on the lifespan of another commonly studied organism, the fruit fly. Helena Cochemé, who collaborated on this study says "As it turned out, the typical laboratory food of fruit flies is rich in sugars. After taking away the sugar we also saw positive effects of metformin in fruit flies colonized with *E. coli*."

#### Bacterial nutrient signalling is a central modulator of microbe-host-drug interactions

Further analysis revealed that bacteria possess a sophisticated

mechanism that enables them to coordinate nutritional and metformin signals and to rewire their own metabolism accordingly. As a result of this adaptation, the bacteria accumulate a metabolite called agmatine which was shown to be required for the positive effects of metformin on host health.

#### What about humans?

Cabreiro collaborated with Christoph Kaleta from Kiel University to investigate whether the results found in *C. elegans* could also be observed in the more complex microbiota of humans. They analysed data related to the microbiome, nutrition and medication status of a large cohort of type-2 diabetic patients and healthy controls. "Intriguingly, we found that metformin treatment was strongly associated with an increased capacity for bacterial agmatine production," says Kaleta. Importantly, they could reproduce their findings in several independent cohorts of type-2 diabetic patients across Europe. Moreover, the bacterial species found to be major producers of agmatine were those known to be increased in the gut microbiome of metformin-treated type-2 diabetic patients.

#### Implications for metformin treatment

"Our results shed light on how the complex network of interactions between diet, microbiota and host impacts the efficacy of drugs," says Cabreiro. "With our high-throughput screening approach we now finally have a tool at hand that allows us to tackle this complexity." The findings of this study may help to inform dietary guidelines or the development of genetically engineered bacteria that could be used to enhance the beneficial effects of metformin. They may also provide a valuable insight into the evidence that suggests that

metformin-treated type-2 diabetic patients are healthier and live longer than non-diabetic individuals.



Image © iStock.com/gilaxia

#### Red wine benefits linked to better gut health, study finds

Science Daily August 28, 2019

A new study from King's has found that people who drank red wine had an increased gut microbiota diversity (a sign of gut health) compared to non-red wine drinkers as well as an association with lower levels of obesity and 'bad' cholesterol.

In a paper published Aug. 28, 2019 in the journal *Gastroenterology*, a team of researchers from the Department of Twin Research & Genetic Epidemiology at King's explored the effect of beer, cider, red wine, white wine and spirits on the gut microbiome (GM) and subsequent health in a group of 916 UK female twins. They found that the GM of red wine drinkers was more diverse compared to non-red wine drinkers. This was not observed with white wine, beer or spirits consumption.

First author of the study, Dr Caroline Le Roy said: "While we have long known of the unexplained benefits of red wine on heart health, this study shows that moderate red wine consumption is associated with greater diversity and a healthier gut microbiota that partly explain its

long debated beneficial effects on health."

The microbiome is the collection of microorganisms in an environment and plays an important role in human health. An imbalance of 'good' microbes compared to 'bad' in the gut can lead to adverse health outcomes such as reduced immune system, weight gain or high cholesterol. A person's gut microbiome with a higher number of different bacterial species is considered a marker of gut health.

The team observed that the gut microbiota of red wine consumers contained a greater number of different bacterial species compared to non-consumers. This result was also observed in three different cohorts in the UK, the U.S. and Belgium. The authors took into account factors such as age, weight, the regular diet and socioeconomic status of the participants and continued to see the association.

The authors believe the main reason for the association is due to the many polyphenols in red wine. Polyphenols are defence chemicals naturally present in many fruits and vegetables. They have many beneficial properties (including antioxidants) and mainly act as a fuel for the microbes present in our system. Lead author Professor Tim Spector said: "This is one of the largest ever studies to explore the effects of red wine in the guts of nearly three thousand people in three different countries and provides insights that the high levels of polyphenols in the grape skin could be responsible for much of the controversial health benefits when used in moderation."

The study also found that red wine consumption was associated with lower levels of obesity and 'bad' cholesterol which was in part due to the gut microbiota. "Although we observed an association between red wine consumption and the gut microbiota diversity, drinking red

wine rarely, such as once every two weeks, seems to be enough to observe an effect. If you must choose one alcoholic drink today, red wine is the one to pick as it seems to potentially exert a beneficial effect on you and your gut microbes, which in turn may also help weight and risk of heart disease. However, it is still advised to consume alcohol with moderation," added Dr Le Roy.

The Twins UK microbiota project was funded by the National Institute of Health. Twins UK is funded by the Wellcome Trust, Medical Research Council, European Union, The CDRF, The Denise Coates Foundation and the National Institute for Health Research (NIHR) through the NIHR BioResource and the NIHR Guy's and St Thomas' Biomedical Research Centre.

**Healthy foods more important than type of diet to reduce heart disease risk**  
Science Daily August 28, 2019

Everyone knows that achieving or maintaining a healthy body weight is one key to preventing cardiovascular disease. But even experts don't agree on the best way to achieve that goal, with some recommending eliminating carbohydrates and others emphasizing reducing fats to lose weight. Few studies have investigated the effects of these specific macronutrients on cardiovascular health.

In a study published online in the International Journal of Cardiology, researchers at Beth Israel Deaconess Medical Center (BIDMC) examined the effects of three healthy diets emphasizing different macronutrients -- carbohydrates, proteins, or unsaturated fats -- on a biomarker that directly reflects

heart injury. Using highly specific tests, the team found that all three diets reduced heart cell damage and inflammation, consistent with improved heart health.

"It's possible that macronutrients matter less than simply eating healthy foods," said corresponding author Stephen Juraschek, MD, PhD, Assistant Professor of Medicine at BIDMC and Harvard Medical School. "Our findings support flexibility in food selection for people attempting to eat a healthier diet and should make it easier. With the average American eating fewer than two servings of fruit and vegetables a day, the typical American diet is quite different from any of these diets, which all included at least four to six servings of fruits and vegetables a day."

Juraschek and colleagues analyzed stored blood samples from 150 participants of the Optimal MacroNutrient Intake Trial to Prevent Heart Disease (OmniHeart) trial, a two-center, inpatient feeding study conducted in Boston and Baltimore between April 2003 and June 2005. The average age among the study participants was 53.6 years, while 55 percent were African American and 45 percent were women. The participants -- all of whom had elevated blood pressure, but were not yet taking medications to control hypertension or cholesterol -- were fed each of three diets -- emphasizing carbohydrates, protein, or unsaturated fat -- for six weeks with feeding periods separated by a washout period.

Image © iStock.com/Martinina





The diets were: a carbohydrate-rich diet similar to the well-known DASH diet, with sugars, grains and starches accounting for more than half of its calories; a protein-rich diet with 10 percent of calories from carbohydrates replaced by protein; and an unsaturated fat-rich diet with 10 percent of calories from carbohydrates replaced by the healthy fats found in avocados, fish and nuts. All three diets were low in unhealthy saturated fat, cholesterol, and sodium, while providing other nutrients at recommended dietary levels. The research team looked at the effects of each diet on biomarkers measured at the end of each dietary period compared to baseline and compared between diets.

All three healthy diets reduced heart injury and inflammation and acted quickly within a 6-week period. However, changing the macronutrients of the diet did not provide extra benefits. This is important for two reasons: First, the effects of diet on heart injury are rapid and cardiac injury can be reduced soon after adopting a healthy diet. Second, it is not the type of diet that matters for cardiac injury (high or low fat, high or low carb), but rather the overall healthfulness of the diet.

"There are multiple debates about dietary carbs and fat, but the message from our data is clear: eating a balanced diet rich in fruits and vegetables, lean meats, and high in fiber that is restricted in red meats, sugary beverages, and sweets, will not only improve cardiovascular risk factors, but also reduce direct injury to the heart," said Juraschek. "Hopefully, these findings will resonate with adults as they shop in grocery stores and with health practitioners providing counsel in clinics throughout the country."



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### Ginkgo biloba may aid in treating type 2 diabetes

Science Daily August 22, 2019

The extract of the leaves of *Ginkgo biloba*, a popular dietary supplement, may offer some therapeutic benefits in fighting Type 2 diabetes, according to a study co-authored by a researcher at the University of Cincinnati (UC) College of Medicine.

"In diabetic rats *Ginkgo biloba* had a very good effect on the beta cells of Langerhans -- cells in the pancreas responsible for insulin secretion -- by creating a restorative effect similar to what we see in healthy non-diabetic rats," says Helal Fouad Hetta, PhD, a postdoctoral fellow and scientist in the UC Division of Digestive Diseases. Hetta is also on faculty at Egypt's Assiut University College of Medicine in the Department of Medical Microbiology and Immunology.

The study in animal models by an international team of 13 researchers was published in the journal *Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy* and is available online. The first author on the research is Ahmed Saleh, PhD, Jazan University in Saudi Arabia.

"The extracts derived from *Ginkgo biloba* have been frequently used in traditional medicine and have been shown to exhibit antioxidant

potency," says Hetta. "Magnetized water, which has been passed through a magnetic field, has also been reported to reduce blood glucose, improve antioxidant status and lipid profiles in diabetic rat models."

In this study, Type 2 Diabetes was induced by feeding rats a high-fat-diet for eight weeks followed by intra-peritoneal injection of a single low dose of streptozotocin, explains Hetta. Forty rats were randomly assigned to four groups: a non-diabetic control group and three diabetic groups. One diabetic group served as a positive control (diabetic), while the other two groups were orally administered with water extract of *Ginkgo biloba* leaves and magnetized water for four weeks, respectively.

The beta cells of diabetic rats are reduced and insulin secretion is curtailed. After having *Ginkgo biloba* and magnetized water added to their diets, the mass of the pancreatic beta cells and the amount of insulin in these cells was shown to increase markedly, almost back to normal levels, particularly in the *Ginkgo biloba*-treated group, says Hetta.

In addition, both *Ginkgo biloba* and magnetized water improved the antioxidant status and reduced the oxidative stress associated with type 2 diabetes by down regulation of the two antioxidant enzymes, glutathione and superoxide dismutase 2, in the pancreatic tissue, says Hetta.

These findings for *Ginkgo biloba*'s impact on Type 2 diabetes are preliminary, says Hetta. "We still need more evidence about possible benefits for Type 2 diabetes so there is ongoing research," says Hetta. "Our findings need to be tested in human clinical trials of large sample size."

"Ginkgo biloba is one of the oldest living tree species," says Hetta. "Most Ginkgo products are made with extract prepared from leaves. Most research on Ginkgo focuses on its effects on dementia and age-related memory impairment such as Alzheimer's disease and pain caused by too little blood flow or claudication. It is commonly available as an oral tablet, extract, capsule or tea. It is not toxic when used in low dosages, but can interact with other medicines."

"I would not recommend eating raw or roasted Ginkgo seeds because they can be poisonous," says Hussein. "It should be taken as a capsule or in tablets if used. Also, if you are currently taking medications please consult with your physicians before considering Ginkgo biloba."

### Optimal vitamin D levels may vary for different ethnic and racial groups

Science Daily August 14, 2019

When recommending vitamin D supplements, doctors should look at each individual patient as having different requirements and not rely on "one-size-fits-all" guidelines, according to a study by researchers at Rutgers and the University of California, San Francisco.

The study, published in the journal *Metabolism, Clinical and Experimental*, highlights the need to gain consensus through improved tests for vitamin D levels that are currently available.

According to the Institute of Medicine, people with less than 20 nanograms of vitamin D per milliliter of blood are deficient. The Endocrine Society set a higher threshold of 30 nanograms. Neither guideline is more definitive than the other at this time.

"Recommendations based on earlier studies using a number of different tests for vitamin D levels persist and, not surprisingly, current guidelines vary," said author Sylvia Christakos, a professor at Rutgers New Jersey Medical School. "For example, it is not clear that the most optimal levels for vitamin D are the same for Caucasians, blacks or Asians alike. More laboratories are now implementing improved tests and efforts are being made to standardize results from different laboratories."

Vitamin D's main function is to help the body absorb calcium. Deficiency can cause delayed skeletal development and rickets in children and may contribute to osteoporosis and increased risk of fracture in adults.

Vitamin D supplements work best when taken with calcium for rickets and bone loss that occurs with aging. Elderly people who are vitamin D deficient benefit from supplementation as protection against fracture. However, studies did not show supplements to be beneficial as protection against fracture if the elderly person was already sufficient in the vitamin.

The researchers also noted that more vitamin D supplementation is not better. Previous studies have shown that very high doses of vitamin D (300,000-500,000iu taken over a year) seem to increase fracture risk. (The National Academy of Medicine recommends 400 iu/day for infants, 600 iu/day for people age 1 to 70 and 800 iu/day for

people over 70; the Endocrine Society suggests doses up to 2,000 iu/day for adults.)

Although vitamin D supplementation has been shown to reduce overall mortality and some studies suggest that vitamin D might be beneficial for immune function, cancer and cardiovascular health, Christakos said a consistent benefit of vitamin D supplementation has yet to be shown. However, she noted, most studies have not discriminated between participants who are vitamin D sufficient or deficient.



### Substituting poultry for red meat may reduce breast cancer risk

Science Daily August 7, 2019

Results from a new study suggest that red meat consumption may increase the risk of breast cancer, whereas poultry consumption may be protective against breast cancer risk. The findings are published in the *International Journal of Cancer*.

For the study, investigators analysed information on consumption of different types of meat and meat cooking practices from 42,012 women who were followed for an average of 7.6 years.

During follow-up, 1,536 invasive breast cancers were diagnosed. Increasing consumption of red meat was associated with increased risk of invasive breast cancer: women





who consumed the highest amount of red meat had a 23% higher risk compared with women who consumed the lowest amount. Conversely, increasing consumption of poultry was associated with decreased invasive breast cancer risk: women with the highest consumption had a 15% lower risk than those with the lowest consumption. Breast cancer was reduced even further for women who substituted poultry for meat.

The findings did not change when analyses controlled for known breast cancer risk factors or potential confounding factors such as race, socioeconomic status, obesity, physical activity, alcohol consumption, and other dietary factors. No associations were observed for cooking practices or chemicals formed when cooking meat at high temperature.

"Red meat has been identified as a probable carcinogen. Our study adds further evidence that red meat consumption may be associated with increased risk of breast cancer whereas poultry was associated with decreased risk," said senior author Dale P. Sandler, PhD, of the National Institute of Environmental Health Sciences. "While the mechanism through which poultry consumption decreases breast cancer risk is not clear, our study does provide evidence that substituting poultry for red meat may be a simple change that can help reduce the incidence of breast cancer."

### Substituting meat with plant protein could prolong life, claims 20-year-long study

28 Aug 2019 Nutrition Insight

Diets high in plant-based protein may contribute to a longer life, according to a study published in *Jama Internal Medicine*.

The study – carried out by the

Japan Public Health Center-based Prospective Study Group – followed 70,696 Japanese adults for almost 20 years, during which 12,381 of the participants died. Based on data collected in questionnaires, researchers found that higher plant protein intake was associated with lower rates of mortality. However, there was no clear association between mortality and animal protein intake. These findings support consumers' growing interest in plant-based proteins for a healthier lifestyle and a more sustainable planet.

Although researchers could not conclude that meat intake leads to higher rates of death, they found that participants who substituted plant protein for meat lived longer. Isocaloric substitution of 3 percent energy from plant protein for red meat protein was associated with lower total, cancer-related and cardiovascular disease (CVD)-related mortality. These results raise the question: Is a longer life expectancy related to a reduction in animal protein or to an increase in plant-based proteins?

A separate study found that eating more plant-based foods demonstrated a protective effect against CVD and cancer. Increased consumption of flavonoids, the compounds found in plant-based food and drinks, was shown to benefit people who actively put themselves at risk for illness through either smoking or drinking.

Plant-based versus meat  
Public health policy continues to  
steer toward a reduction in red



meat, as more research on the benefits of plant-based diets arises. The British Association of Dietitians Blue Dot initiative recommends reducing red and processed meat to 70g per person per day. The same amount of meat is advised by the World Cancer Research Fund - prioritizing plant proteins such as beans, nuts, soy and tofu.

Policymakers in the UK are also seeking ways to increase public health and improve environmental sustainability by lowering meat consumption. Last month, the Eating Better alliance announced that it aims to achieve a 50 percent reduction in meat and dairy consumption in the UK by 2030. "The goal is a necessary and achievable target for the UK," Mark Breen, Communications Associate at Eating Better, tells NutritionInsight.

However, researchers are still in debate about the role of red meat in cancer. "Epidemiological studies of red meat consumption and risk of breast cancer are inconsistent," says Yong-Moon Park M.D., M.S., Ph.D., Postdoctoral Fellow, Epidemiology Branch, National Institute of Environmental Health Sciences. "Red meat has been identified as a probable carcinogen because there has been some suggestion of an association between red meat consumption and cancer risk from the previous studies," Park adds.

### Industry innovations in plant-based protein

Regardless of what nutritional factors are truly at the heart of lower mortality rates, consumer interest is piqued for plant-based proteins. Several companies have developed innovations to meet this interest, and studies continue to find new sources of plant-based proteins.

Mankai, an aquatic strain of duckweed was recently found to be a protein-rich superfood in a study conducted by the Ben-Gurion University of the Negev in Israel. Not only is the plant found to host a variety of nutrients, but it may also control blood sugar levels and curb appetites.

Mycoprotein – the funghi-derived and protein-rich food source that is unique to Quorn products – was recently in the spotlight for stimulating post-exercise muscle building to a greater extent than milk protein. The results from a study conducted at the University of Exeter say that mycoprotein may present a solution for muscle building for those who opt for plant-based diets.

In the snacking space, Zeno Nutrition recently launched its keto- and diabetic-friendly energy bars. The nutritional bars based on nuts, fruit and cocoa use plant-based proteins to meet their target customers' dietary demands.

While some researchers hesitate to point fingers at meat consumption as a cause of CVD and cancer, consumer-driven demand for more plant-based and sustainable sources of protein persist throughout 2019. Policy regarding health and the environment continue to support the plant-based movement.

This was also evidence last October when in-depth analysis involving the University of Oxford and the Potsdam Institute for Climate Impact Research in Germany (among other researchers) assessed the food systems' environmental impact, a significant driver of climate change. The study concluded that dietary changes are needed to slow the impact of climate change and warned that meat consumption should be dramatically reduced in favor of plant-based diets.

By Missy Green

## Phosphatidyl-choline could reduce dementia risk and boost cognition, says study

07 Aug 2019 Nutrition Insight

The dietary intake of phosphatidylcholine has been connected with a reduced risk of dementia for the first time by researchers at the University of Eastern Finland.

The nutrient, which was mainly sourced from eggs and meat, was also linked to enhanced cognitive performance in the prospective study, published in the American Journal of Clinical Nutrition. Participants with the highest dietary phosphatidylcholine had a 28 percent lower risk of dementia than those with the lowest intake. Additionally, they excelled in the tests measuring their memory and linguistic abilities. The researchers are now calling for further research to enable a decisive result.

Phosphatidylcholines are a class of phospholipids and can be found in sources including egg yolks and soybeans. It is one of the various compounds that choline, an essential nutrient, can occur as. Choline is essential for the formation of the neurotransmitter, acetylcholine. Prior studies had linked choline intake and cognitive processing, with adequate intake potentially helping to prevent cognitive decline and Alzheimer's disease. The nutrient is already used in a multi-nutrient medical drink that aims to treat early Alzheimer's.

The data examined was taken from the Kuopio Ischaemic Heart Disease Risk Factor Study, KIHDS. Between 1984 and 1989, researchers recorded the general health and dietary and lifestyle habits of 2,497 dementia-free men, aged between 42 and 60. Four years later, a subset of 482 men completed five different tests to examine their memory and cognitive performance. After an



Image © iStock.com/LightFieldStudios

average follow-up period of 22 years from study onset, all the data was combined with the men's hospital records, cause of death records and medication reimbursement records. It was found that 337 men belonging to the whole cohort developed dementia.

Last year, a supplement aimed at athletes, gamers and students using phosphatidylcholine was launched. This analyses also accounted for other lifestyle and nutritional factors which could have influenced the associations. The APOE4 gene, which predisposes to Alzheimer's disease and is commonly found in the Finnish population, was accounted for and showed no significant impact. "However, this is just one observational study, and we need further research before any definitive conclusions can be drawn," says Maija Ylilauri, a Ph.D. student at the University of Eastern Finland.

Researchers were inspired to investigate the connection as moderate egg intake had been associated with improved cognitive performances in observational studies. This is potentially due to the high levels of choline, especially phosphatidylcholine, in the eggs. However, in this study, it was found that while eggs were the key phosphatidylcholine source (39 percent), intake via meat was also substantial (37 percent). The mean daily choline intake was 431mg, of which 188mg was specifically phosphatidylcholine.



Last year, research suggested that significantly higher choline intakes during pregnancy, particularly in the final trimester, may result in faster information processing for babies. Infants whose mothers consumed 930mg daily had higher information processing speeds at all ages when compared to infants whose mothers only consumed 480mg of choline each day. Despite choline being in high-demand during pregnancy, most women consume less than the recommended 450mg per day. On average, pregnant women actually consume just 319mg of choline daily.

Additionally, Summacum released a mental cognition supplement featuring Cognizin Citicoline, a catalyst for producing phosphatidylcholine. Konzentrations Booster is aimed at athletes, gamers and students. The company says that the supplement increases oxygen delivery to the brain, which may improve mental performance.

By Katherine Durrell

### Cognitive boost: Study flags lutein's potential in influencing memory performance

05 Aug 2019 Nutrition Insight

**Lutein, a carotenoid, may influence hippocampal-dependent memory performance, possibly via its antioxidant and anti-inflammatory effects.**

This is according to a University of Illinois, US, study, published in *Nutrients*. The study found that higher serum levels of lutein are linked to accuracy in object binding and inversely related to misplacement error. The

researchers note however that further research is warranted as this study does not establish a causal relationship between lutein and memory function.

Obesity has been associated with poorer cognitive function, including poorer hippocampal function. One potential mechanism related to both obesity and hippocampal function may be related to decreased intake and neural concentration of lutein – a carotenoid that accumulates in neural tissue at concentrations up to five times more than other carotenoids.

In this cross-sectional study of 94 overweight or obese adults (aged 25-45), the researchers aimed to understand whether dietary, serum or macular levels of lutein and other carotenoids were associated with relational memory function.

Relational memory is a hippocampal-dependent process that allows us to put a face with a name or retell a story in any order we choose. One way to assess relational memory is with a spatial reconstruction task, which requires participants to return objects to the locations they had previously seen them.

The study participants completed a computerized spatial reconstruction task to evaluate relational memory. They also received assessments for dietary intake of lutein, intelligence quotient (IQ), serum carotenoids, and retinal carotenoids.

The findings showed that serum beta-carotene and lutein as well as dietary beta-carotene and lutein + zeaxanthin correlated with memory

performance. However, after adjusting for covariates, the only associations that remained significant were between serum lutein and two metrics of relational memory performance: serum lutein was positively correlated with accuracy in object binding and inversely related to misplacement error.

Because of the cross-sectional design, this study cannot establish a causal relationship between lutein and memory function. Randomized controlled trials are needed to determine whether or not changes in lutein status induce changes in the hippocampal-dependent relational memory performance.

Edited by Kristiana Lalou



### Coffee fix? Intake linked to reduced risk of depression in Japanese elderly

By Gary Scattergood 23-Jul-2019 - Food Navigator Asia

**Coffee intake has been linked with a decreased risk of depressive symptoms among elderly Japanese women, according to a new multi-centre cross-sectional study.**

Almost one-in-three people in Japan is now over the age of 65, with country facing a rapidly ageing population, twinned with a diminishing birth rate.



Those aged 65 or older now make up a record 35.6 million, or 28.1 per cent of the total population, the government said last year. Meanwhile, those aged 70 or older now account for 20.7 per cent of the population, breaking the 20 per cent for the first time.

In light of this, policymakers and researchers are eager to look at nutritional solutions to maintain health and quality of life among the ageing population. This new study noted that while epidemiological evidence of the association of beverages with depressive symptoms has received considerable research attention, similar investigations on the association of coffee and green tea with depressive symptoms for the elderly population were limited.

Academics from Nakamura Gakuen University and the University of Tokyo therefore conducted a cross-sectional examination of the association of depressive symptoms with the intake of coffee, green tea and caffeine and to verify the antidepressant effect of caffeine.

#### Clear association

They assessed 1992 women aged 65–94 years. Intakes of coffee, green tea and caffeine as well as depressive symptoms were assessed with a validated brief dietary history questionnaire (BDHQ) and the Center for Epidemiologic Studies Depression Scale (CES-D), respectively. Multiple logistic regression analysis was used to calculate odds ratios (OR) and 95% confidence intervals (CI) for depressive symptoms with adjustments for potential confounders.

The findings revealed that coffee intake in particular was associated with a lower prevalence of depressive symptoms. The academics wrote: “The odds ratios of which for the fourth versus the first quartiles of intake was 0.64 (95% CI 0.46-0.88, P for trend = 0.01) in a fully adjusted model.

Caffeine intake was marginally associated with depressive symptoms, but the association was not statistically significant.”

They suggested that their findings were worthy of further investigation, especially into the specific benefits conferred by coffee. “The result suggests that the inverse association on depressive symptoms might be expected not only caffeine intake, but also some other substances in coffee or factors related to coffee intake. Because of its cross-sectional design, longitudinal studies are required to confirm the present finding.”

#### Consumption of A2 milk has positive effect on gastrointestinal system and cognition in pre-schoolers: China study

By Guan Yu Lim 08-Aug-2019 - NutraIngredients Asia

A new study has found that replacing conventional milk with A2 milk greatly reduced gastrointestinal symptoms associated with lactose intolerance in Chinese preschool children, and saw improvements in their cognitive performance.

Researchers from Australia and China's universities compared the effects of five days consumption of conventional milk (containing A1 and A2 -casein) and A2 milk (contain A2 -casein only). “Conventional milk increased serum inflammatory and immune biomarkers, as well as an increased cognitive test error rate compared with A2 milk in the pre-schoolers.” The findings were published in the Journal of Pediatric Gastroenterology and Nutrition.



Image © iStock.com/AtnoYdur

#### Assessment

The study recruited 75 children aged five and six with mild-to-moderate lactose intolerance. In a double-blind, randomised, controlled, crossover study, subjects enrolled in a 5-day phase 1 intervention of either conventional milk or A2 milk and blood samples were taken. They consumed the 250mL milk twice daily after a meal. The milk was provided by a2 Infant Nutrition Limited in Shanghai, China. Subjects then entered a nine-day washout period before switching over to the other milk product for another five days.

#### Outcome

The primary outcome of the study found consumption of conventional milk induced a significant increase ( $p < 0.0001$ ) in gastrointestinal symptoms compared to A2 milk, while A2 milk reduced biomarkers of inflammation. Researchers said, “These results are

also similar to those from a study by UIHaq and colleagues, who reported that consumption of A1 -casein induced an inflammatory response by activating the Th2 pathway in a mouse model.”

#### Faecal matters

The researchers also found that after five days of A2 milk consumption, there were significantly higher mean faecal concentrations of acetic acid, butanoic acid, and total short-chain fatty acids SCFA, when compared with consuming conventional milk. “This is relevant because SCFAs are fermentation products of gut microbiota, with reported anti-inflammatory properties, able to amplify colonic cell function,” researchers added. “These results are consistent with previous observations in adults that conventional milk reduces SCFA levels and impairs colonic health.”



In this study, consumption of conventional milk was associated with a significantly higher stool frequency and significantly higher Bristol Stool Scale scores compared with the consumption of A2 milk. They cited the similarity in adults, “The study by Jianqin and colleagues revealed longer gastrointestinal transit times, softer stools, and a greater incidence of diarrhoea, when adults consumed conventional milk. These data suggest that exclusion of A1 - casein may help alleviate adverse gastrointestinal symptoms.”

### Cognitive function

The researchers also found that the pre-schoolers performed better in a Subtle Cognitive Impairment Test after consumption of A2 milk. They noted improved accuracy and results in both automatic and attentional processes. These data suggest that consumption of A2 milk has a positive effect not only on the gastrointestinal system, but also on cognition in pre-schoolers.

### Conclusion

The researchers concluded: “We report that conventional milk induces an inflammatory state that exacerbates the symptoms of digestive discomfort associated with lactose intolerance. “Consumption of A1 -casein induces inflammation in the small intestine. A2 -casein, however, has a much slower rate of proteolytic digestion; therefore, its consumption results in a much lower yield of BCM-7. This exacerbation can be reduced by removal of A1 -casein (via replacement with A2 -casein), with subsequent improvement in gastrointestinal symptoms and aspects of cognitive function.”

### Feeling the heat: High chilli intake linked to cognitive decline in Chinese adults

By Guan Yu Lim 06-Aug-2019 - Food Navigator Asia

Chilli consumption above 50g a day has been linked to cognitive

decline in Chinese adults, according to researchers from Qatar, Australia and USA.

The 15-year study enrolled 4852 adults in China and is the first population study investigating the association between chilli intake and cognitive function. Capsaicin, the active component in chilli, has previously been found to have benefits in relation to mortality, obesity and hypertension. But its effect on long-term cognition function had yet to be elucidated in animals and humans. The researchers wrote in this current study, “High chilli intake was associated with almost doubled the risk of self-reported poor memory in Chinese adults, especially among those with normal body weight.”

### Study design

The study followed participants who were part of the China Health and Nutrition Survey between 1991 and 2006. Dietary intake data was collected in 1991, 1993, 1997, 2000, 2004, 2006 and cognition tests were conducted in 1997, 2000, 2004 and 2006. Chilli intake, which included fresh and dried chili peppers, but not sweet capsicum or black pepper, was assessed using a three-day food record during home visits. Height, weight, and blood pressure were also measured. Participants were classified into four groups: non-consumers, 1–20 g/day, 20–50 g/day and >50 g/day. It was noted that the serving size in the context of Chinese food is a Liang (1 Liang = 50 g), hence the median portion size of chili intake was 50 g.

The global cognitive score was calculated using composite scores of memory (words recall), counting back and subtraction scores. Participants were also asked to self-report on memory changes (improvement, decline, maintain) through a questionnaire.

**Chilli intake and cognitive function**  
The study found the overall cognitive score declined in all chilli intake levels between 1997 and 2006, however there was greater prevalence of self-reported poor memory and memory decline with higher chilli intake. “Compared with non-consumers, those who consumed more than 50 g/day had a lower global cognitive score. Those who ate chili 0, 1–20, 20–50 and >50 g/day had regression coefficients (95% CI) for the global cognitive score of 0, 0.17, - 0.31 and - 1.13 respectively.”

Overall, compared with non-consumers, a chilli intake higher than 50 g/day was associated with more than twice the risk of having self-reported poor memory and 56% increased risk of having self-reported memory decline. Researchers also said the effect was slightly more significant ( $p=0.046$ ) in participants with lower BMI. In a previous study, “We found chilli intake decreased the risk of obesity. In the current study, the effect of chilli on cognitive function appears to be stronger among those with normal body weight. It could be that those with normal body weight are more sensitive to chilli intake.”

Whether BMI mediates the association between chilli intake and cognitive function, further research is needed, the researchers noted. There are animal studies with conflicting results regarding the role of capsaicin in cognition function. Some suggested red peppers prevented memory deficit in rats, while others found it to be neurotoxic by denervation of sensory nerves, impacting neuronal viability and thus cognitive function.



Image © iStock.com/XiXinXing

### Limitations

The researchers said one of the limitations of the study was not being able to explore the potential mechanisms due to a lack of related biomarkers. "For instance, there was a significant difference in chilli intake among people with different education levels. It is well known that level of education affects cognitive function, so it is possible that the confounding effect of education may still contribute to the relationship between chilli intake and cognitive function." They recommended: Future random control trial designs may help tease out this complicated relationship to confirm chilli intake and cognitive function.

### Keto diet claims vs reality: What the science says

By Nikki Cutler 13-Aug-2019  
NutraIngredients

The keto diet is often not the performance boosting mechanism it is claimed to be, according to an expert who plans to set the record straight at NutraIngredients' Sports Nutrition Summit next month.

The three-day event is set to investigate some of the biggest trends in the industry and answer burning questions on how different diets influence sports performance and how industry players can best meet the needs of these athletes. Dr Mark Evans, postdoctoral researcher at University College Dublin, will explain how the keto diet has been

touted as a way to take advantage of the body's large fat stores to fuel exercise for longer and improve exercise performance, however, it's important to consider how intense that exercise is going to be.

### What's the keto diet?

In a sneak preview of his take at the summit in Amsterdam, Dr Evans explains that for a person to follow a ketogenic diet they must get 80-85% of their calories from fat, consume less than 50 grams of carbohydrates per day and the remaining 15% of their calories from protein. "So it's a very restrictive diet compared to the typical Western diet which is around 45-60% carbs and 20% fat."

Dr Evans explains that the ketogenic diet is often falsely confused with a high fat diet which involves getting about 70% of your calories per day from fat but that diet is still not extreme enough to raise the levels of ketones in the body.

### Why go keto?

Dr Evans explains that some people choose to follow the ketogenic diet as it has been claimed that the body can only store a certain amount of carbs which means we have a limited amount of energy stores. Whereas if a person can reach a 'ketogenic state' then they will be able to take advantage of their fat stores and the argument is that they will have access to more energy. "For example, an athlete may have 10 kilos of fat stored as adipose tissue and you're talking 9 calories per gram of fat so that's 90,000 calories worth of total fat in the

body," he explains. "But one issue with the arguments around keto diets is there is no consensus as to how to tell when a person has

become fully adapted to a ketogenic diet. There's no biomarkers universally accepted but there are some markers that people think indicate some level of keto adaptation, such as by testing the levels of ketones in your blood through a simple finger prick test."

### The science says...

Dr Evans argues that, based on the evidence so far, reaching a ketogenic status means you might not impair your performance at lower intensities of exercise but is likely to be detrimental to high intensity performance. "When you do a high intensity workout, this is carbohydrate dependent and so if you are reducing your carb stores then you are inhibiting the pathways in the body to allow you to burn carbs. So, for sports that include intermittent or repeated high intensity efforts like team sports and endurance sports, the keto diet is not currently recommended for exercise performance."

### Why the confusion?

Dr Evans believes a lot of the studies testing the use of ketone supplements on athletic performance have been confused with studies on people following a keto diet "Our studies concentrated on raising ketone levels in the blood by supplementing the person with ketones which is very different to the person following a keto diet. They are still taking in a sufficient amount of carbs for high intensity performance but they are taking on supplements to elevate their level of ketones and this is a new way people are trying to improve performance."

One such study by Dr Evans, found that a Ketone ester may have cognitive boosting properties that enable athletes to make crucial decisions during the final stages of a match. Dr Evans will discuss this subject and his research in further detail during The Sports Nutrition Summit, in Amsterdam, next month.





## Meta-analysis supports curcumin's anti-inflammatory and metabolic benefits

By Stephen Daniells 26-Aug-2019  
-NutraIngredients Latam

Supplementation with curcumin from turmeric may boost levels of adiponectin, a protein hormone with multiple beneficial effects, including regulating blood sugar levels and anti-inflammatory action.

Despite a relatively small body of science to date, scientists from Coventry University (UK) and Tehran University of Medical Sciences (Iran) reported that data from six randomized controlled trials with human subjects showed that, compared to placebo, curcumin supplementation significantly increased adiponectin concentrations.

"Curcumin has been approved by the United States FDA and considered a 'generally recognized as safe' supplement, whilst its tolerability has been confirmed in several clinical studies," they wrote in the journal *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*. "Therefore, owing to its safety and beneficial effects on several features of metabolic syndrome, and results of the present meta-analysis, curcumin may be suggested as a routine supplement for patients with metabolic syndrome, and other metabolic disorders."

### Blockbuster

The study adds to the ever-growing body of science supporting the potential health benefits of turmeric and curcumin. According to the 2017 Herb Market Report published by the American Botanical Council (HerbalGram119), turmeric is the number one selling herb in the



Image © iStock.com/Sarah Biesinger

natural channel, with \$50.3 million (12% growth year-over-year). It is number five in the mass channel (MULO) with \$32.5 million in sales (48% growth y-o-y). The new meta-analysis focused purely on adiponectin, and included data from a total of 652 people.

### Key findings

"Adiponectin is an anti-inflammatory cytokine produced and secreted by adipose tissue. Adiponectin serum level reportedly has an inverse relationship with insulin resistance, dyslipidaemia, CVDs, and obesity, whilst decreases in adiponectin may resultantly increase the risk of atherosclerotic disease," explained the authors. "Adiponectin has a positive effect in reducing the risk of cardio-metabolic disease, which is associated with lipid and glucose metabolism, anti-inflammatory, and anti-atherosclerotic properties.

"In the present study, we were able to confirm the veracity of a number of independent studies, highlighting that curcumin supplementation, particularly when consumed for less than 10 weeks, significantly increase adiponectin levels, even when controlling for numerous biological and sociological variables."

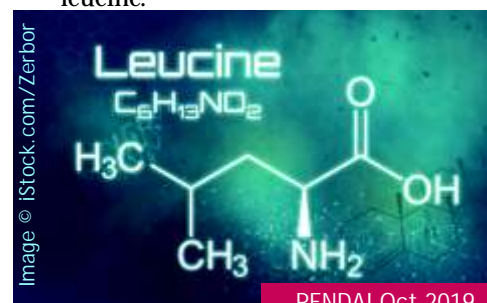
Commenting on the potential limitations of the current analysis, the authors noted that the small number of studies in the literature show that there is a need for more high-quality RCTs to strengthen the association between curcumin and adiponectin levels.

## Not all proteins are equal: Leucine triggers muscle protein synthesis more effectively than others - study

By Tingmin Koe 27-Aug-2019  
-NutraIngredients Asia

Protein supplements containing high amounts of leucine are more effective than others in triggering muscle building synthesis, a kinesiology professor has argued, citing a number of scientific studies.

Dr Stuart Phillips, a professor from McMaster University's Department of Kinesiology, was speaking at the event "Building towards Sustainable Physical Activity Behaviour" organised by International Life Sciences Institute South East Asia (ILSI-SEA) recently. In his presentation, he highlighted that the amino acid leucine was more effective in triggering muscle protein synthesis as compared to the others. "Of all the amino acids, leucine has taken on the role of prominence... This is the branched-chain amino acid that triggers the response of muscle protein synthesis," he said. Citing a number of scientific studies, he said that compared to adding branched-chain amino acids (BCAA) to whey protein, or increasing the consumption of whey protein, adding leucine was more effective in augmenting muscle protein synthesis. A study involving elderly women also showed that leucine consumption helped to stimulate muscle protein synthesis during both rest and exercise. "It is not just an added response, it is actually synergistic and it is driven by a single amino acid," he said when explaining the impact of leucine.



Supplements with good scientific evidence

As part of the International Olympic Committee (IOC), Philips pointed out that only a few sports supplements have shown good evidence for enhancing muscle protein synthesis. The IOC issued a consensus statement in March last year, stating that only a few supplements, such as caffeine, creatine, bicarbonate, nitrate, beta-alanine, and CHO drinks have shown good evidence of benefits. Philips pointed out that others such as omega-3, vitamin D, and probiotics could be categorised as “B grade hopefuls” while he argued BCAA, HMB, glutamine, arginine, and zinc need more evidence. He also said that there has been “no evidence” to show that protein supplements are better than real food, except that supplements provided an ease of convenience.

#### Intervening factors

There are a number of factors that will intervene with the amount of protein intake required for muscle protein synthesis. These factors included mobility, amount of exercise, and age, Philips said. For instance, while protein supplement could help to gain muscles, the impact is not as significant when compared to the benefits gained by going to the gym. “When you are physically active, the amount of leucine needed to trigger muscle protein synthesis drops. You can actually get away with lower doses of leucine but its transient. In other words, you have to keep exercising,” Philips said. This therefore means that when one is immobile or confined to bed rest, more leucine intake will be required to trigger muscle protein synthesis.

#### How much and when?

Besides the right type of protein, there is also the issue of consuming the right amount of protein at the right time. Philips pointed out that the ideal amount of protein intake was 0.3 – 0.5g/ kg for per meal dose, with the optimal intake per

day ranging from 1.6g/kg to 2.2g/kg. Since the rate of muscle protein synthesis is lower in elderly than in young people, the elderly had to consume a higher amount of protein. On the other hand, protein supplementation needs to take place throughout the day, ideally four times in a day, instead of consuming it once per day.

### Opinion: How to boost vitamin D levels amid findings that low levels and depression are strongly linked

By Carl Gibson 07-Aug-2019  
-NutraIngredients Asia

A recent study linked low levels of vitamin D and depression in older people writes the CEO of trade body Complementary Medicines Australia Carl Gibson.

The study came from The Irish Longitudinal Study on Ageing (TILDA) at Trinity College Dublin. It showed for the first time in Ireland that a deficiency in vitamin D is linked with a major risk for depression. Vitamin D deficiency was associated with a 75% increase in the risk of developing depression. Published in The Journal of Post-Acute and Long-Term Care Medicine (JAMDA), the results are part of the most extensive representative study of its kind. Researchers examined the vitamin D status of older adults and depression and then re-examined the individuals four years later.

Other smaller studies have linked low vitamin D levels with depression, but few studies have followed up with the same people over time. Also, other studies did not take existing depression, chronic diseases, physical activity and cardiovascular disease into account. People taking anti-depressants and vitamin D supplements were not included in the study either. The authors suggest that the findings could be due to the direct effect of

vitamin D on the brain. Ageing affects the structure and function of the brain and vitamin D may protect against these changes. Other research has linked low vitamin D status with neurodegenerative diseases such as Parkinson's disease, dementia and multiple sclerosis as well as a range of other chronic conditions. Dr Eamon Laird was the senior study author and Research



Fellow with TILDA. He said: “What is surprising is the large effect on depression even after accounting for other control variables. This is highly relevant for Ireland as our previous research has shown that one in eight older adults are deficient in the summer and one in four during the winter. Moreover, only around eight per cent of older Irish adults report taking a vitamin D supplement.”

“Given that vitamin D is safe in the recommended intakes and is relatively cheap, this study adds to the growing evidence on the benefits of vitamin D for health. It also helps to continue to impress the need on our public health bodies to develop Irish vitamin D recommendations for the general public. Up to this point, these are severely lacking.”

Vitamin D is different from other vitamins - chemically speaking it is more a hormone than a vitamin. As well as being vital for healthy bones and teeth, vitamin D also regulates cell growth, neuromuscular and immune function, and reduction of inflammation.



Unlike other vitamins, our primary source is not from food – most of our vitamin D is made by the skin when UVB light reacts with a fatty cholesterol-like substance in the skin (hence it is also called the sunshine vitamin). So, you would think that in Australia, the sunburnt country, Australians would not be short of vitamin D. But you'd be wrong. Australians and vitamin D deficiency Vitamin D deficiency is surprisingly common and affects a large proportion of Australians.

One in three Australians is deficient in vitamin D and nearly three quarters (73 per cent) had levels considered by many experts as below the optimal for musculoskeletal health. Getting enough vitamin D through safe sun exposure, diet and/or supplements is vital for general good health and to help fight off chronic diseases.

#### Who's at risk?

People at risk of low vitamin D levels include those who:

- Don't get out much in the sun
- Are obese (vitamin D is stored in fat but doesn't get out again until the fat is broken down, i.e. with when weight is lost).
- Have a medical condition that affects vitamin D metabolism.
- Have naturally dark skin (darker skin tones contain more melanin, which blocks the absorption of ultraviolet light) or cover up with clothing.
- Have very fair skin. Some research suggests that people with fair skin may be lacking in vitamin D, partly due to sunavoidance because of the fear of sunburn. Sunscreen also blocks vitamin D production as it does its important job of protecting the skin.

• Are an older Australian. According to Harvard Health, older people have lower levels of the substance in the skin that UV light converts into the vitamin D precursor and may be less efficient at producing vitamin D too.

Three tips to pass on to consumers

to boost vitamin D levels

#### 1. Take a walk

In winter, midday is the best time to get out; the energetic UV that produces vitamin D is not around in the early morning or late afternoon

#### 2. Choose vitamin D-containing foods

Around 10 per cent of vitamin requirements come from food - vitamin D rich foods include: Liver (this isn't suitable if you're pregnant or planning pregnancy as it can also contain very high levels of vitamin A). Oily fish – such as salmon, sardines and fresh tuna. Fortified foods – including breakfast cereals, eggs and milk. Full-fat milk contains the most vitamin D, and that's one reason why whole milk is best for toddlers and young children. You can now also buy mushrooms that contain higher levels of vitamin D.

#### 3. Select a supplement

Supplements can raise blood vitamin D levels when deficiency is moderate. Cholecalciferol (vitamin D3) 1000 IU or 25 micrograms is the supplement most commonly used; multivitamin supplements that contain 32–200 IU per unit don't provide enough vitamin D to treat or prevent vitamin D deficiency. If levels are very deficient (individuals should ask their doctor for a blood test to find out), vitamin D injections may be needed to raise blood levels quickly.

As mentioned, the sun is the primary source of vitamin D. However, for those who have a diagnosed deficiency exposing themselves to the amount of sun that may be needed to raise vitamin D levels could pose a health risk. A GP may recommend vitamin D supplements, which should be taken strictly as directed. Once low vitamin D is treated, the affected person will need to maintain normal vitamin D levels; healthcare practitioners can provide tailored advice.



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### Pomegranate juice shows promise for baby brain development

By Nikki Hancocks23-Aug-2019  
-NutrIngredients

Consuming pomegranate juice daily during pregnancy may protect brain development and brain connectivity in growth restricted babies, a new pilot study has revealed.

In ongoing investigations, clinical researchers are exploring whether pomegranate juice intake during pregnancy can have a protective effect. In a paper appearing in PLOS One, the team presents its preliminary findings from a clinical trial of expectant mothers whose babies were diagnosed with intrauterine growth restriction (IUGR). The exploratory study, supported by National Institute of Health Grants, The Foundation for Barnes-Jewish Hospital and an unrestricted gift from POM Wonderful, paved the way for a second, larger clinical trial is currently underway at the Brigham to validate these findings. "Our study provides preliminary evidence suggesting potential protective effects for newborns exposed to pomegranate juice while in utero," said senior author Terrie Inder, MBCHB, chair of the Department of Pediatric Newborn Medicine at the Brigham. "These findings warrant continued investigation into the potential neuro-protective effects of polyphenols in at-risk newborns, such as those with hypoxic-ischemic injury."

### Polyphenol potential

Polyphenols, which include tannic acid and ellagitannins, are part of a class of antioxidants found in many foods and beverages, including nuts, berries, red wine and teas.

Pomegranate juice is a particularly rich source of these molecules.

Polyphenols are known to cross the blood-brain barrier, and studies in animal models have demonstrated protective effects against neurodegenerative diseases. To date, no clinical studies had evaluated the potential effects of giving pregnant women pomegranate juice to protect the brains of at-risk newborns.

### Method

The current randomized, controlled, double-blinded study enrolled 78 mothers from Barnes-Jewish Hospital obstetric clinic in St. Louis with IUGR diagnosed at 24-43 weeks' gestation. Women were randomized to receive 8 ounces of pomegranate juice daily or a taste/calorie matched placebo that was polyphenol free. Women drank the juice daily from enrolment until delivery. The team measured several aspects of brain development and injury, including infant brain macrostructure, microstructural organization and functional connectivity. While the team did not observe differences in brain macrostructure, they did find regional differences in white matter microstructure and functional connectivity.

"These measures tell us about how the brain is developing functionally," said Inder. "We saw no difference in brain growth and baby growth, but we did see improvement in cabling network and brain development measured by synchronous blood flow and visual development of the brain."

The authors note that the findings warrant the need for a larger, rigorously designed clinical trial to allow continued investigation into the potential neuro-protective effects of polyphenols. Such a study is now

underway at the Brigham. "We plan to continue investigating these exciting findings," said Inder. "While the preliminary evidence shows promise, additional study and replication is needed."

### IUGR

In cases of IUGR, a baby in the womb is measuring small for its gestational age, often because of issues with the placenta, which brings oxygen and nutrients to the growing fetus. One out of every 10 babies is considered to have IUGR. The process of birth itself can further decrease blood flow or oxygen to the baby, including to the baby's brain. If this is very severe, it can result in a condition known as hypoxic-ischemic injury, which contributes to almost one-quarter of new born deaths worldwide.

### Researchers examine performance, recovery effects of a prebiotic + protein food bar

By Adi Menayang 14-Aug-2019  
-NutraIngredients

Carbohydrate-loading is a popular way for athletes to energize and recover. New study suggests that different types of carbohydrates may have different effects.

Most commercially available carbohydrate-rich energy drinks, gels, and bars have a relatively high glycemic index, argued researchers from Texas A&M University, and therefore may not be suitable for individuals who are glucose intolerant, diabetic, or susceptible to hypoglycemia during exercise. Hence, the goal was to investigate whether replacing the carbohydrates found in traditional sports nutrition bars with a different composition (in this case whey protein and a plant-

derived fiber called isomaltoligosaccharide) might confer performance and recovery benefits. According to the researchers, isomaltoligosaccharides are a fiber that can be classified as a prebiotic—in other words, it is a carbohydrate that has been observed to stimulate activity of bacteria in the gut.

In their study of 12 men with experience in weight lifting, they found some evidence that the novel food bar of whey protein and the prebiotic can "positively affect glucose homeostasis, help maintain workout performance, and lessen perceptions of muscle soreness," they reported in their paper, published yesterday in the Journal of the International Society of Sports Nutrition.

They came to this conclusion by comparing the participants' exercise performance and questionnaire



responses after ingesting the whey and prebiotic bar (NutraBolt's Fit Joy, which has since been reformulated) versus a carbohydrate matched dextrose gel, which had the same amount of carbohydrates but a different overall nutritional profile. "Research has shown that different types of carbohydrate and protein can have varying effects on substrate availability, exercise metabolism, performance, and/or recovery," they wrote.



### Building on previous research

The same team had previously examined the bar's effects on glycemic and insulin response in a trial with four women and six men, and found that the bar increased insulin to a greater degree while maintaining blood glucose to a better degree than the control. Building on this previous knowledge, the researchers hypothesized that ingestion of this whey protein food bar containing the prebiotic would promote a low to moderate glycemic response with a similar insulin response during exercise, help athletes maintain exercise performance capacity during an intense training session, and hasten recovery. "Results revealed that ingestion of this food bar promoted a more favourable glucose and insulin profile in response to intense exercise," they added.

In terms of performance and recovery, the researchers reported no significant interactions, but added that an analysis of changes from the beginning of the trial revealed that leg press and total lifting volume was maintained when participants consumed the protein and prebiotic bar compared to dextrose. "While it is understandable that athletes/experienced lifters may not be able to maintain 70% of one repetition maximum for each exercise during an intense workout due to fatigue, this finding provides some evidence that ingestion of the food bar helped maintain the quality of the resistance-exercise training session."

The study was a crossover trial, which means each participant ingested one type of food bar during one clinic visit, and after a seven-day 'wash-out' period, they ingest the other type of bar and perform the same exercises. Researchers collect and compare data from both visits. The twelve men consumed either a carbohydrate matched dextrose comparator as a control or Nutrabolt'sFitJoy, containing 20 g

of whey, 25 g of the prebiotic isomalto-oligosaccharide, and 7 g of fat.

The intervention food items were consumed 30-minutes before, mid-way, and following intense exercise, which consisted of 11 resistance exercises and agility and sprint conditioning drills. Researchers collected blood to assess catabolic and inflammatory markers and rated perception of muscle soreness. The study was open label, which meant that both participants and investigators knew which food intervention was being consumed, leaving the possibility of so-called placebo effect especially when rating muscle soreness. "With that said, the major strengths of this study were the randomized and crossover experimental design and assessment of a typical intense training bout used in the strength and conditioning of athletes."

### Smokers and drinkers benefit more from flavonoid-rich diet's protective effect

3By Will Chu 19-Aug-2019  
-NutraIngredients

Dietary intake of the kinds of flavonoids found in apples and tea may ward off certain types of cancer and heart-related disease, a Danish cohort study finds, especially for smokers and heavy drinkers.

Data from the Danish Diet, Cancer and Health cohort finds that those consuming 500 milligrams (mg) of total flavonoids a day had the lowest risk of a cancer or heart disease-related death. Total flavonoid intake and its link to mortality rates appear stronger in smokers than in non-smokers, as well as in heavy versus low-moderate alcohol consumers.

"It's important to note

that flavonoid consumption does not counteract all of the increased risk of death caused by smoking and high alcohol consumption," says lead researcher Dr Nicola Bondonno. "By far the best thing to do for your health is to quit smoking and cut down on alcohol. It's important to consume a variety of different flavonoid compounds found in different plant based food and drink," adds Bondonno, a post-doctoral research fellow at Australia's Edith Cowan University (ECU). "This is easily achievable through the diet: one cup of tea, one apple, one orange, 100 grams (g) of blueberries, and 100g of broccoli would provide a wide range of flavonoid compounds and over 500mg of total flavonoids."

### Anti-inflammatory effects

An estimated 7.8 million premature deaths worldwide in 2013 is attributable to a fruit and vegetable intake below 800 g/day. While, flavonoids show anti-inflammatory effects and improvements to blood vessel function, emerging evidence suggests they may offer greater protection to those with harmful lifestyle habits.

Flavonoids may also protect against some of the detrimental effects that these factors have on nitric oxide bioavailability, endothelial function, blood pressure, inflammation, blood lipids, platelet function, and/or thrombosis. In the prospective cohort study, researchers from ECU and Herlev & Gentofte University Hospital in Denmark followed 56,048 Danish participants for 23 years, recording 14,083 deaths.



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Data analysis found a moderate habitual intake of flavonoids was inversely associated with all-cause, cardiovascular- and cancer-related mortality. This association appeared to plateau at intakes of around 500 mg/day. In addition, the inverse associations between total flavonoid intake and mortality outcomes were considered stronger and linear in smokers than in non-smokers,

This observation was also true for heavy (more than 20 grams per day (g/d)) versus low-moderate (less than 20 g/d) alcohol consumers. "These findings are important as they highlight the potential to prevent cancer and heart disease by encouraging the consumption of flavonoid-rich foods, particularly in people at high risk of these chronic diseases," says Dr Bondonno. "We know these kinds of lifestyle changes can be very challenging, so encouraging flavonoid consumption might be a novel way to alleviate the increased risk, while also encouraging people to quit smoking and reduce their alcohol intake."

**Gut microbiome influence?**  
Writing in the *Nature Communications* journal, the team think the findings could contribute to optimising dietary guidelines in those engaging in harmful dietary habits. Here, the study's observations could help ensure flavonoid intake is adequate considering these populations may benefit more from higher intakes. Equally, the team point to the inverse association between flavonoid intake and mortality as usually weaker in obese participants.

The findings go against the team's hypothesis that flavonoids would be more protective in obese individuals as they have higher levels of inflammation, oxidative stress, and vascular dysfunction. This is difficult to interpret; the team say, as there is evidence that flavonoids influence body composition. Here the gut microbiome may be significant as studies have shown its

role in flavonoid metabolism and therefore bioactivity and is dissimilar in obese individuals.

### Sodium citrate supplements may boost tennis performance: Brazilian study

By Stephen Daniells 22-Aug-2019 - NutraIngredients

Shot accuracy and muscle performance during games of tennis may be increased by sodium citrate supplementation, says a new study in nationally ranked young Brazilian tennis players Writing in the *Journal of the International Society of Sports Nutrition*.

Scientists from the University of Campinas and the University of Sao Paulo report that 0.5 grams of sodium citrate (SC) per kg of body mass led to greater shot consistency and a greater amount of games won in simulated matches.

"Importantly, no players reported any significant GI discomfort following SC supplementation," they wrote. "Practically, it appears that SC supplementation can be safely and effectively utilized in tennis players to enhanced skilled performance. Although, it cannot be known from these results if SC supplementation would be beneficial in long lasting matches, previous data has shown SC to be effective for up to 30 km of cycling, thus it is possible that SC could be beneficial in matches lasting for multiple hours. Importantly, if SC is utilized in training sessions, training volume could be increased to allow for greater duration of quality skill practice."

#### "A mixed bag"

Commenting independently on the study's findings, Dr Chad Kerkick,



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director of the Exercise and Performance Nutrition Laboratory at Lindenwood University in Missouri, told us that previous work on sodium citrate has been a "mixed bag of outcomes with many initial null outcomes may being due to inappropriate study designs", before noting that the new study used a randomized, double-blind, placebo-controlled crossover design, which he described as "always a good start to developing a sense of trust for their outcomes".

Dr Kerkick also said that the use of trained athletes was a positive, but the fact that tennis was investigated does hinder its external validity. "Their measured outcomes were realistic and suitable for what they intended to investigate," he added.

#### Study details

The researchers recruited 10 Brazilian nationally-ranked young male tennis players to participate in their study. The players were randomly given either placebo or 500 mg of SC per kg of body mass of sodium citrate two hours before skill tennis performance tests (STPT) and repeated-sprint ability shuttle tests. These tests were followed by a one hour simulated match. Results showed that the sodium citrate group experienced increases in all metabolic parameters, including pH, from the start of the study to pre-match and then post-match. Pre- and post-match increases were greater



compared to placebo, said the researchers.

“[T]he current study not only noted superior shot consistency (%) in STPT and a greater amount of games won in the simulated match in SC compared to [placebo], but also a positive correlation between pH level and games won,” wrote the researchers. “Therefore, it seems that SC was able to prolong muscle contractile capabilities.

“Theoretically, prolonging muscle force production would enhance an athlete’s ability to perform training volume, which is the training variable most closely and positively associated with muscle performance adaptations.”

### Sports Nutrition Summit: ‘Food first approach over supplement use,’ ESSNA recommends

By Will Chu 13-Aug-2019 - NutraIngredients

Daily exposure to social media and other media outlets alongside an ever-expanding market, places an overemphasis on the use of dietary supplements for the general consumer.

Those thoughts will be discussed in greater detail by Ross Austen, vice chair of the European Specialist Sports Nutrition Alliance (ESSNA), at this year’s NutraIngredients Sports Nutrition Summit (SNS).

In his presentation Austen, an expert in performance nutrition, presents a case for a ‘food-first approach’ for both elite and leisure athletes, with highly selective supplementation as a last resort to fill clearly identified gaps. He also points to the dubious marketing strategies of some brands that tout their supplement as a ‘magic bullet’

aiding fat loss, building muscle etc.

“The foundations for a healthy eating regime, eating the appropriate macros/micros around your training plan must be the first port of call when looking for performance gains,” he explains. “The fine tuning of this regime and supplementing areas, which would otherwise be lacking is indeed appropriate and often necessary but I believe the greater gains can first be found in addressing the basics.”

#### Caffeine, creatine et al

ESSNA’s vice chair since 2018, Austen’s thoughts about a food-first approach align closely with those of The International Association of Athletics Federation (IAAF). In its updated guidelines for athletes, The Federation highlights caffeine,

creatine, nitrate/beetroot juice, beta-alanine and bicarbonate as the only supplements with evidence pointing towards their contribution to

performance. “Currently there are only a handful of products that show performance improvements and so more research is required,” said Austen. “That being said the placebo effect has been shown to be pretty powerful resulting in a positive impact on performance. Therefore, if the individual whole heartedly believes the products are assisting their performance, so long as they are not causing any untoward harm and the risk of inadvertent doping is being managed, I would lean towards suggesting that the athletes and nutritionists should have the autonomy to make that call.”

#### Supplementation for elderly

Despite Austen’s preference for

whole food consumption, he does think supplementation has its place particularly in the older athlete, where doctors may prescribe supplements to address iron deficiency or where eating whole foods prove physically difficult. “I 100% agree the aging population are suffering from sarcopenia (muscle loss) as a result of anabolic resistance and a decline in exercise activity,” says Austen. “Anabolic resistance can be counteracted by a higher intake of protein over the course of a day. “Therefore the use of nutritional shakes or boosting meals with protein powders can go a long way to reach the desired levels,” he adds.

In summing up his thoughts, Austen believes supplement providers can do more to remain relevance to athletes alongside providing hard evidence, collaborative research and honesty. “There is a real risk of inadvertent doping to athletes,” Austen says. “It is integral for supplement providers to ensure they carry out the necessary testing via programmes such as Informed-Sport to provide assurances to athletes and end consumers.

### Study reveals health benefits of personalised advice

By Nikki Hancocks 22-Aug-2019 - NutraIngredients

Personalised advice may evoke more health benefits than generic advice in elderly people, according to an analysis executed as part of a collaborative research project between TNO and Wageningen University and Research.



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sufficient to achieve health benefits. Behavioural change techniques can be used to motivate individuals to actually change their lifestyle. Our study was the first that attempted to combine all these aspects in one integral nutrition advice system."

The nine-week intervention study found that personalised advice (PA) on nutrition and exercise had a positive impact on the health of people aged 60 and above, including a reduction in body fat percentage and hip circumference.

Results revealed that, overall, seniors receiving lifestyle advice over a period of nine weeks, either personalised or generic, improved physical function. However, PA participants also showed a reduction in body fat percentage and hip circumference, whereas these parameters increased in the generic advice (GA) group. Resilience and motivation slightly improved only in the PA group, whilst mental health and energy showed slight improvement only in the GA group.

Iris de Hoogh, research scientist at TNO who helped carry out this study, points out that this is one of the first studies using a holistic approach towards personalised nutrition.

"Personalised nutrition and health is still a relatively young and emerging field of research. Most studies so far took a fairly mono-disciplinary approach towards personalised nutrition, by focusing only on a few personalisation factors (e.g. only genetics) or health outcomes (e.g. glucose response to foods).

"We believe that true personalisation requires taking into account an individual's health status, as well as their current lifestyle, preferences and personality. Additionally, just providing advice may not be

A total of 59 independently living participants (22 males, 37 females) with a mean age of  $67.7 \pm 4.8$  years were included in the study. All participants were at least 60 years old; reported sedentary behaviour for at least 10 hours a day; were in good health and had a self-reported BMI of 20–30 kg/m<sup>2</sup>. Participating seniors were not informed about the purpose of the study (single-blind). Participants were randomly allocated to either the intervention group or the control group balanced for gender, muscle health (i.e. hand grip strength) and socio-psychological factors.

Before and after the intervention period, self-perceived health was evaluated as parameter of wellbeing using a self-perceived health score (single-item) and two questionnaires. Additionally, anthropometry and physical functioning were assessed. The generic advice for improving muscle health was based on the national food-based dietary guidelines as published by the Netherlands Nutrition Centre. Participants were provided with a leaflet contained guidelines on the consumption of five categories of basic food products as well as generic guidelines for an active lifestyle, meaning at least 30 min of physical activity per day.

The PA group received the same leaflet as well as personalised advice through an online portal. The PA promoted muscle health among seniors and was in line with national

and international recommendations provided by the Health Council of the Netherlands, the Netherlands Nutrition Centre and International expert groups. The PA involved nine elements, of which seven focused on diet and two focused on physical activity. The content of the nine PA for each participant was determined with underlying decision trees incorporating biological and genetic (SNP) personalisation factors.

Previous studies have demonstrated beneficial effects of personalised nutrition advice, but it remains unclear whether personalisation of advice based on genotype or phenotype has additional value compared to personalisation based on dietary intake alone. Personalised Nutrition & Health programme TNO and Wageningen University & Research have taken on a Personalised Nutrition & Health Programme initiative aiming to help individuals to be able to adopt an eating pattern precisely attuned to their needs Hoogh says that this study helped with their aims of designing a personalised advice system.

"The (small) additional health benefits of personalised advice as compared to generic advice in a population of elderly people not only provide backing to continue our research and our search for effective components in personalised health. Also, the knowledge and experience we gained in designing our personalised advice system and performing the study are very valuable in optimising our system and translating this to other target groups.

"Within the Personalised Nutrition & Health research consortium we use these lessons learned in developing and validating the technology and knowledge needed to make personalised food and health advice possible on a large scale, and enabling consumers to make their healthy choice."



## The vegan athlete: Opening opportunities

By Nikki Cutler 14-Aug-2019 -  
NutraIngredients

The number of vegan athletes is growing and so are the opportunities for vegan supplement sales, according to a sports nutritionist who will reveal the biggest industry opportunities at NutraIngredients' upcoming Sports Nutrition Summit.

Giving a preview of his scheduled talk in Amsterdam next month, Phil Woodbridge, human performance exercise and wellbeing technical support officer at Buckinghamshire New University, points out that the number of vegans in Great Britain is growing fast.

In fact, that number quadrupled between 2014 and 2018. In 2018 there were 600,000 vegans - 1.16% of the population. And the sporting community is very much in-line with this overall trend, in fact, Woodbridge says Vegan Runners UK membership is up to more than 4,000.

### The good and the bad

Yet scientific research into how the vegan diet impacts athletic performance has so far have been sparse and equivocal.

Those studies that have revealed a higher likelihood of nutritional

deficiencies in vegan athletes have collectively suggested that the most likely vegan diet deficiencies will be in; protein, calcium, vitamin b12, serum D3, zinc, iron, iodine, selenium and Vitamin D.

The nutritional benefits of a vegan diet that have been noted are the high CHO and fibre intake and better fat profile of the vegan diet and these reason are partly why it is often assumed to be healthier to go vegan.

Woodbridge says: "One of the widespread myths is if you go vegan you will be healthier but there's a lot of processed vegan foods so there's good and bad vegan diets and you still need to get the balance right."

### Opportunities

As well as the listed nutrition deficiencies above, Woodbridge points out that another issue that vegan runners can struggle with is energy. In fact, Woodbridge says this is the main issue that vegan runners come to speak to him about and this can even lead to a suppressed immunity. He says this is a big opportunity for the supplements industry. "There's an opportunity here for energy dense plant-based products that are ethical."

In terms of other opportunities for NPD in this market, Woodbridge points out that Vitamin B12 is generally one that vegans know to

supplement with and many plant-based milks are fortified with calcium and riboflavin so these are of smaller concern.

Two other lesser known vegan diet deficiencies that have been noted in scientific literature are creatine and beta alanine.

"We don't get them in a plant based diet so supplementing these in vegans may have more of an impact on performance than it will in meat eating runners."

The Sports Nutrition Summit, brought to you by NutraIngredients is back for a second year!

Bringing together industry and research professionals in the active and performance nutrition space, the Sports Nutrition Summit aims to bridge the gaps between cutting edge science, business strategy and key regulatory developments to shine a light on the key consumers in the sports and active nutrition industry, and what you can do to meet their needs.

Challenging you to know your market the 2019 programme will explore the latest scientific and product developments across the consumer spectrum - looking at active sports nutrition consumers by category, life stage and by geography.

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# & FOOD SCIENCE TECHNOLOGY NEWS

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## Thinking out of the lunchbox: How do school meals and snacking impact children's nutrition?

29 Aug 2019 Nutrition Insight

As the summer season draws to a close, children around the world prepare to go back to school. Among the preparations, and beyond pencils and notebooks, healthy meals and snacking at school are a parent's proverbial headache.

Childhood obesity is a constant concern, driven by high-sugar snacks and junk food marketing aimed at children. With the demand for clean label products and natural ingredients rising, NutritionInsight examines the effect school meals can have on children's nutrition. Moreover, what are the popular snacking trends among schoolchildren and what role does policy play in promoting healthy meal options?

School is a huge part of children's lives and what they consume during the school day is of crucial importance and may shape their nutritional habits later in life. Lunchboxes prepared at home may seem the easiest way to control a child's nutrition but parents' busy lifestyles often prevent them from preparing food. For this reason,

convenient snacking options and cafeteria meals remain popular choices among schoolchildren.

Recognizing this market, the industry has taken steps to appeal to those parents who may not have ample time to prepare food for their children, but still want them to eat nutritiously dense foods. Innova Market Insights reports a compound average annual growth rate (CAGR) of 11 percent in food and beverage launches with a school claim from 2013 to 2017, which includes "at school," "school lunches" and "after school."

The market researcher further notes that "No Additives/Preservatives" is a growing claim among food and beverage products with a school claim, seeing a CAGR of 36 percent in the period from 2013 to 2017.

Convenience drives NPD

Some recent examples of launches targeting school snacking include KIND's Breakfast Probiotics bar line which boasts 500 million CFU

probiotic cultures. The bars are available in three flavours, Apple Cinnamon, Orange Cranberry and Peanut Butter Dark Chocolate.

In the same space and founded by a group of popular actors including Kristen Bell, This Bar Saves Lives is a brand of children's cereal bars that is boasting a nutritious content as well as a social impact. For every bar purchased a child in need is fed, via the company's collaboration with several NGOs.

Lunchables remain a popular option, however they are criticized for their often poor nutritional value. In the same genre, Sargento Foods has launched Sunrise Balanced Breaks. Within the refrigerated snacks category, the launch combines nutritious natural cheese and other ingredients like walnut oat granola, quinoa clusters or maple pumpkin seeds.

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of obesity, according to research from the University of California San Francisco (USCF) Benioff Children's Hospital. Nutrition programs and policy role

School-based nutrition programs and recommendations promote healthier eating habits and result in a lower body mass index (BMI) among middle schoolers, found a study by the Yale School of Public Health.

The findings indicated the importance of promoting health in schools to help mitigate childhood obesity. Schools that didn't receive support to implement nutritional policies and programs showed a three to four percent increase in BMI across their student body compared to schools that had enhanced support in implementing such policies and programs.

Noting the importance of school lunches on children's nutrition, in 2010 the Obama administration spearheaded change via a set of nutrition rules for US school meals. Championed by former first lady Michelle Obama, the "Healthy, Hunger-Free Kids Act" reduced school lunch calorie limits, cut sodium and trans fats and added more fruits, vegetables and whole grains to the menu.

However, in December 2018, the Trump administration urged the US Department of Agriculture (USDA) to amend the nutrition rules meaning that white bread and low-fat, flavoured milk are back on the menu. The move drew ire from nutrition advocates and think tanks but was framed by US Secretary of Agriculture Sonny Perdue as "empowering" and giving "flexibility" back to school cafeterias.

The Safe Snack Guide is a resource that seeks to keep allergens out of the classroom and the home. Meanwhile, in Canada, it was found that children do not eat enough vegetables, fruit or dairy products during school hours, causing them to fail to reach several daily dietary recommendations on school days. This issue was compounded by the fact that intake of less nutritious foods like sugar-sweetened beverages, salty snacks and candies was relatively higher during school hours. The University of British Columbia (UBC) research findings highlight the importance of policy in promoting healthy meal options during school hours, as opposed to unhealthy snacks.

In the UK, obesity-prevention charity Sugarwise flagged that British children are consuming high levels of sugar at school due to a lack of limits being in place. Its new certification scheme that curbs the over-consumption of sugar launches in June in over 500 schools who have limited the sugar content in their foods to become certified Sugarwise ahead of the national scheme's official launch. Schools in Ireland, Germany and Belgium, who also have no sugar limits for children, will also jump aboard the scheme later this year.

Shifting responsibility onto school administrators, SnackSafely.com, publisher of the Safe Snack Guide, a resource that seeks to keep allergens out of the classroom and the home, announced a new feature that allows teachers and school nurses to tailor custom snack guides to match the allergen restrictions of their students.

Lastly, the Center for Disease Control and Prevention (CDC) recently released a set of "health hacks for back-to-school success." Among the suggestions are limiting sugary drinks consumption, eating healthy and maintaining an active lifestyle.

By KristianaLalou

Homemade meals and parental influence

Homemade meals and snacks, however, are the choice that parents with less hectic schedules may prefer. Lunchboxes packed with fruit, vegetables, nuts and whole grains are a good way to assist in what children consume at school and ensure that they keep away from indulgent temptation. The dietary habits of children are significantly influenced by the environment they grow up in and the eating habits of their parents.

Damon Korb, M.D., a fellow of the American Academy of Pediatrics, supports that, children over nine years old should prepare their own school lunches. Korb says this move may help kids get themselves to take on more of their own responsibilities. In addition, it will teach them more about nutrition and how to make healthy food choices.

Nevertheless, not all parents follow healthy eating patterns. The dietary habits of children are significantly influenced by the environment they grow up in and the eating habits of their parents. Every child has its own specific nutritional needs and while all parents want their children to be nutritiously fed; dietary habits can almost be "hereditary." Children from families with obese parents are at a significantly higher risk of obesity compared to children with normal-weight parents. A child with one obese parent has a 50 percent chance of being obese.

When both parents are obese, their children have an 80 percent chance

## Trending in nutrition: Healthy aging, dairy innovations and personalization top the list

14 Aug 2019 Nutrition Insight

Trends may be pegged as fleeting but they have the lasting ability to shape the industry and promote innovation. NutritionInsight speaks to industry experts on the nutrition trends of the moment, as well as upcoming ones.

Healthy aging, personalized nutrition, dairy innovation, natural ingredients and better-for-you positionings, in addition to elimination diets, are topping the list. Consumers have become more aware of what is best for their health and have corresponding demands for clean label, natural and health-promoting ingredients. "People are more and more aware of the value of nutrition for health. At the same time there is a growing concern over the lack of transparency from many food and beverage companies. People are looking for healthy foods they know they can trust," says Nard Clabbers, Senior Business Developer Personalized Nutrition at the Netherlands Organisation for Applied Scientific Research (TNO).

"With a wealth of information readily available at their fingertips, individuals nowadays have a better understanding of their own health needs and, as a result, the ways in which consumers are engaging with their wellbeing are evolving," says Stephane Vouche, Marketing Manager, Consumer Health & Nutrition at Lonza. Customers are also increasingly aware of the importance of gut health on overall health and cognitive function, as the science of the human microbiome develops. This is driving demand for products that improve digestive wellness including dairy-derived probiotics, says Stephen Gregory, Head of Technical Innovation,



Image: iStock.com/RossHelen

NZMP Medical Nutrition and Healthy Ageing at Fonterra.

To identify current trends within the

nutrition industry, DSM conducted the Global Health Concerns Study 2019. The survey interviewed over 17,000 people across 23 countries worldwide and revealed that energy is now the number one health concern across Europe, the Middle East and Africa (EMEA), with 67 percent of consumers saying they are worried about tiredness. With a wealth of information readily available at their fingertips, individuals nowadays have a better understanding of their own health needs. "These results indicate a clear shift in consumer concerns and perceptions of their nutritional and health requirements since 2017, when weight management was found to be the top concern for consumers," says Maria Pavlidou, Head of Marketing Communications EMEA, DSM Nutritional Products Human Nutrition & Health.

### Healthy aging and dairy

Life expectancy has expanded and the global population is fast growing older. This is contributing to consumers being increasingly aware of the importance of healthy aging and disease prevention. Bone health and mobility are also rising concerns that several industry players have identified as a crucially important market. "There is an opportunity to provide solutions for this diverse group of consumers that align to current nutritional trends, which include preservation of muscle mass with quality protein, as well as an increasing focus on digestive wellness," says Gregory.

"Bone health and mobility is also important to our senior consumers

to maintain their independence into later life, and this is well served with dairy with its naturally-present calcium and complete protein. With an aging population, comes an increase in disease prevalence, with consumers wanting to increase their 'health span' as opposed to their life span. Malnutrition and sarcopenia (age-related muscle loss) are both prevalent amongst the older population and are linked with poor quality of life and worse health outcomes," Gregory notes. He says that this presents a good opportunity for dairy to strike the balance between providing compact nutrition, and having a taste and texture that is enjoyable, particularly for the ageing palate.

NZMP Medical Nutrition pegs dairy as a key protein source that remains strong in terms of quality nutrition and application flexibility. "The naturally present branched-chain amino acids are proven to stimulate muscle protein synthesis in the body," Gregory explains. "While as recently as five years ago, demand for more protein in diets was linked primarily to bodybuilders and elite athletes, in recent years we have seen a significant 'mainstreaming' of healthy, active lifestyles and with it, demand for protein-fortified foods across all customer segments," he adds. There is a lot of opportunity to provide fortified normal foods as well as supplements with functional ingredients which can be derived from dairy, Gregory notes. "Dairy, and especially fermented dairy, has shown to be associated with health benefits in many studies. Dairy is simply a high quality food," says Clabbers. "On the other hand, not all people realize that dairy, which is always seen as the healthy and 'vegetarian' option, is also associated with challenges in animal welfare."

### Lactose-free market

Dairy may also be an allergen source for some, which is partly driving the lactose-free dairy market. Nicolas Touillon, Business



Director Dairy, DSM Food Specialties, says that the market for lactose-free products is growing at a rapid pace. The perceived health benefits of lactose-free dairy are playing an increasingly prominent role in the strong growth of this category. "In light of the rapid market growth, it is important that lactose-free dairy producers differentiate themselves to stand out in an increasingly competitive category. There are a number of avenues manufacturers can explore to do so; the perception that lactose-free products are healthy, for instance, makes them the ideal candidate for fortification and additional health claims," Touillon notes.

Dairy may be an allergen source for some, which is partly driving the lactose-free dairy market. Particularly in medical nutrition, many diseases and medications can cause temporary or chronic lactose intolerance. For this reason it's important to provide high protein, low lactose, whey-dominant options for a well-supported recovery, Gregory notes. Recognizing this need, NZMP has developed a low-lactose dairy protein range which includes a highly functional, heat and acid-stable whey protein ingredient for medical applications, as well as a milk protein ingredient with heat stability properties and a creamy flavour, he says. "Both ingredients are a renovation from a patient-led perspective to ensure we provide digestive comfort to our consumers, whether they are sensitive to lactose, or just prefer low-lactose options."

Personalization and demand for natural, sustainable ingredients Personalization is becoming particularly prominent in the health and nutrition industry, says Vouche. A Lonza commissioned survey found that the millennial generation is largely open to the opportunities that personalization presents to learn more about their bodies. Respondents were particularly

receptive to wearable devices to help manage weight or monitor physical activity or sleep. Across all age groups, over half of those surveyed would be interested in a DNA or home blood test to determine their likely nutritional needs and identify any potential nutrient deficiencies. "We are getting better at measuring the health effects of food so that, for the first time, people can actually measure what food does for them instead of having to wait to see the effects," says Clabbers. "I expect that all this would lead to consumers buying more foods that are known to be healthy. The three most important aspects of food (price, taste and convenience) will always remain important but health will also grow. I definitely see a lot of opportunity for product development in those that I would call 'processed for health' or 'convenient fresh.'"

Clabbers says that whole food, less processed products and more plant-based offerings are leading the way in nutrition trends. "There is a dichotomy between wanting less ultra-processed and more meat alternatives. The latter are very often highly-processed. We probably need new heuristics to determine what we eat, to help people make the 'right' choice. Many people are struggling to balance all the aspects that come together in food, like health and sustainability. People could be assisted in that choice based on individual preferences and needs," he says.

#### What's next

Consumers are becoming more aware of the health benefiting foods and ingredients they can opt for. Nutrition trends are centered around consumer demands for clean label, naturally sourced choices. However certain sectors, such as dairy, maintain their classic appeal due to their significant nutritious benefits. Personalization and sustainability however have an impact across the board. By KristianaLalou

## The rise of personalized nutrition: Experts call for a "tailored approach" to push the needle

02 Aug 2019 Nutrition Insight

Personalization in nutrition is rapidly gaining momentum. Industry is seeing the trend rise with bespoke NPD and nutritional services becoming increasingly mainstream. From tailored gut testing to gene testing and wearable technology, the methods and techniques surrounding personalization are growing.

However, while digital advances have made it possible for people to track their physical activity, personalized nutrition in its truest form has yet to be fully addressed. There is, of course, a basic understanding that a clean diet and regular exercise will lead to weight loss, a one-size-fits-all approach may not work for everybody. Macro- and micronutrient intake may differ among individuals. Each body is different and in-depth analysis can provide a clearer picture of what needs to be done. "We are entering an age of personalized nutrition where science and technology can dictate which food is right for us. It's not only for weight management but more importantly to manage our overall health and well-being," says Sandeep Gupta, Chief Founder and Director of the Expert Nutraceutical Advocacy Council (ENAC). Gupta – who will be speaking at the forthcoming Vitafoods Asia 2019 Conference in September – also explains that consumers are constantly finding ways to monitor their health status. "Not long ago, we believed our genetic makeup was pre-determined and a biological reality," he says.

Image © iStock.com/ronstik



“The emergence of epigenetics, which is the study of mechanisms that switch genes on and off, has shed light on the fact that our genes are fluid and can be shaped by various internal and external factors.”

#### Personalized nutrition players

Personalized nutrition companies can now collect and analyze biodata, after which, they customize nutrition plans that help meet their clients' health goals – be it weight management or disease prevention. Biodata is collected in various ways, including wearable devices that can collect rudimentary information such as an individual's rate of physical activity or height and weight. Home testing kits collect specialized data such as DNA, nutrient levels in blood, blood types and even gut microbiomes.

NutritionInsight has been closely following the developments within the personalized nutrition space including business partnerships, NPD and a swathe of start-up and well-established corporations entering the market. Personalized nutrition companies can now collect and analyze biodata to customize nutrition plans. The Quisper Project is a Belgian start-up developing and testing a digital platform that will offer personalized nutrition services within Europe. Quisper has developed an app that allows businesses to connect with independent and scientifically validated services designed for use by companies, healthcare services, researchers and professionals who want to provide improved personalized nutrition advice.

Late last year, Persona, a personalized nutrition platform, also launched Vitamin Packs Pro, a portal for nutritional assessment and dietary supplement analysis. The portal enables healthcare practitioners to quickly cross-reference and assess over 650 prescription medications to gain insights into how to avoid drug-

nutrient interactions, according to the company. Royal DSM partnered with digital health provider Panaceutics to bring to the market “affordable” products geared specifically towards health and wellness. The collaboration will see DSM exclusively market and sell Panaceutics Nutrition personalized products in multiple markets across the Americas, Europe and Asia, strengthening DSM's position in the personalized nutrition field

Last year, DSM also acquired a majority stake in personalized nutrition start-up Mixfit. The combination of DSM's customized solutions and Mixfit's advanced technology means consumers can analyze and receive the nutrients they need at the time they need them and from the convenience of their own homes, DSM reports. Mixfit's Intelligent Nutrition Assistant (Mina) is the Artificial Intelligence (AI) that analyzes a person's genetic makeup, alongside their diet, lifestyle and health goals, to create and dispense beverages containing a customized mix of DSM's Quali Blends with vitamins and minerals throughout the day. Earlier this week, Mayo Clinic and Viome – a company transforming health through personalized nutrition based on individual and microbiome biology – joined forces to better understand the role of nutrition in disease. The collaboration will explore the potential of Viome's AI-driven personalized diets in helping to manage disorders such as sleep apnea and obesity. The two companies hope to acquire a better understanding of how nutrition affects chronic diseases and to explore the effectiveness of personalized nutrition as a strategy to help in treatment, and possibly even the prevention of these diseases.

#### Personalized nutrition in different territories

Europe and the US are at the forefront of personalized nutrition.

It is also a growing trend in Asia, with developed countries such as Japan, South Korea and Singapore seeing the most activity. Some examples in Asia include Singapore's Imagen Labs, which formulates supplements and fitness solutions according to DNA; and Nestlé Japan's partnership with Genesis Healthcare and Halmek Ventures, both of which are DNA labs based in Japan, designed to provide personalized nutrition advice for seniors. The partnership has garnered over 100,000 participants since its announcement last May.

#### Large corporations can boost start-up innovation

Personalized nutrition can help in the prevention front, by uncovering the genetic qualities of those who are predisposed to develop diabetes. Disease prevention is a key aim of personalized nutrition. For instance, diabetes can be prevented through dietary improvements. Type 2 diabetes, the more common form of the disease, afflicts nearly half a billion people around the globe. Hayes adds that the global cost of diabetes is estimated to be almost US\$1 trillion per year; the bulk of this cost is spent on managing the complications that arise from diabetes, rather than treating the disease itself.

Personalized nutrition can help in the prevention front, by uncovering the genetic qualities of those who are predisposed to develop diabetes. Genetics can be a valuable source of data input in forming personalized nutrition recommendations and products for diabetes prevention. This, however, needs more scientific backing. “It can be challenging to design effective and efficient personalized nutrition services for different individuals and getting the technology in sync with parameters like individual dietary preferences, age group, health conditions, and so on. Doing this is costly and companies may face growth constraints as a result,” Gupta says.



Furthermore, the data needs to be extra secure to ensure it does not end up in the wrong hands, he says. To resolve these issues, personalized nutrition start-ups could partner with large corporations to offset the high costs of research and customization.

Edited by Kristiana Lalou

### As plant-based alternative sales soar, brands & retailers must address challenges facing sector

By Elizabeth Crawford 20-Aug-2019 - Food Navigator USA

Americans' love affair with plant-based meat likely will continue to heat up in the coming year with the vast majority of consumers who have tried them reporting that they intend to continue to buy them, even though many prefer eating animal-based meat, according to the market intelligence firm Numerator.

To take full advantage of this potential, though, Numerator says retailers and plant-based meat manufacturers must overcome several major hurdles, including making the products easier to find, increasing the variety and offering more affordable options. Based on data from Numerator's InfoScoutOmniPanel, which tracks purchases of more than 450,000 Americans, 80% of US shoppers intend to replace some or all real meat with plant-based meat alternatives in the next year.

While only 36% say they will replace a "small portion" of animal-based meat with plant-based alternatives, 23% say they will replace a significant portion and 21% say they will replace all. This doesn't include the 11% who report they already don't eat animal meat, according to Numerator. These rates are slightly higher than last year – when Numerator found half of meat eaters ate more alternatives and nearly 40% ate less real meat. This suggests the shift towards plant-

based at the expense of animal-based will continue. This shift also is notable because it also represents a sacrifice by many Americans.

According to Numerator, about half of the people who tried plant-based products prefer animal-based meat, with 21% reporting that they strongly prefer it and 28% saying they only slightly prefer it. On the opposite end of the spectrum, 29% said they either slightly or strongly preferred plant-based meat, according to Numerator. But this doesn't mean most people are "dissatisfied" with plant-based alternatives to animal products. Rather, 62% said they were very or extremely satisfied, 83% said they would recommend them to someone else and 81% said they would try other types of plant-based meat alternatives, according to Numerator.

Plant-based dairy alternatives are also on the rise. The shift towards plant-based products isn't limited to meat alternatives. Numerator also found more Americans reaching for plant-based dairy alternatives than in prior years. According to the data, 47% of shoppers consumed more plant-based dairy alternatives compared to last year, while 43% said they were consuming the same amount. Some dairy stakeholders say they are not threatened by the trend because consumers are still buying their products, and the option to buy plant-based options is in addition to animal-based purchases. However, the data from Numerator questions whether this remains true. It found 29% of shoppers consumed less animal-based dairy this year compared to last and only 53% consuming about the same amount.

#### Increase availability and access

While the plant-based alternative industry appears to have the wind at its back, it still must overcome several hurdles to take full advantage of consumer interest in its products. For example, finding

plant-based alternatives is still a struggle for a quarter of buyers who say they can't find them at their usual grocery store, according to Numerator. Another hurdle is the price-point for many plant-based alternatives to red meat, according to the data which found "many triers ... concerned about the cost of these products," according to the intelligence firm.

These challenges also reveal opportunities for manufacturers and retailers. Numerator notes that "brands wanting to jump onto this movement need to do a few things," including "investing in product innovation as consumers have communicated an openness to branching out to other plant-based meat alternatives like fish and chicken."

It also recommends that brands continue to promote the 'likeness' of plant-based alternatives to animal meat as well as the health and environmental benefits. On the retail said, Numerator recommends stores place plant-based alternatives to animal meat more prominently so that they are easier to find. If they do so, they likely will be rewarded by higher basket rings and better store-wide performance across categories, as consumers who buy plant-based meats tend to spend about 13% more on groceries annually.

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## Danish Crown launches 50/50 concept

By Aidan Fortune 22-Aug-2019 - Food Navigator

Danish Crown has launched a new range of meat products that are supplemented with vegetables. Set to be launched next week in REMA 100 and MENY stores, half of the meat content has been replaced by vegetables.

Danish Crown is targeting shoppers who want to cut consumption a little without losing the taste of the good Danish meat. "The concept is called 50/50, and is being launched in both a beef and pork variant. 50% of the content is meat of the same high quality that the Danes know from Danish Crown's products, while the remaining 50% are vegetables, which are of course also high quality," said Finn Klostermann, CEO of Danish Crown Beef.

Kamilla Wetke, senior brand manager at Danish Crown, and has been close to developing the products, explained the different variants. "There is a taste variation on beef and pork, which is why the vegetables have to compliment the different flavours. In Grønt & Gris we have added carrots, peppers and chickpeas, while we have replaced the carrots with kidney beans in Grønt & Okse. In addition, both variants are also keyhole labelled with only 6% fat, so they match consumers' desire for lean and low-salt products." Klostermann added that despite this innovation, Danish Crown's focus will remain on meat. "It is important to emphasize that

our core product is meat. That being said, we must also keep in mind that consumers are increasingly demanding alternatives to meat, and of course we would like to be able to offer them. At Danish Crown we have the equipment and expertise to develop these products so that they sit right in the closet - the first time." In July, Danish Crown announced the launch of a plant steak before the end of the year. It already supplies a number of hybrid beef products to individual retail chains under the chains' own brands, but these products only contain between 20-30% vegetables.

## Protein in yeast: Taiwan firm develops patented technology for producing MT

By Tingmin Koe 20-Aug-2019  
-NutraIngredients Asia

Taiwan-based Formosa HMT Biotech has developed a technology for producing metallotionein (MT) protein in yeast, and plans to sell the ingredient for use in nutraceuticals by the end of this year.

MT is naturally found in the skin and upper gastrointestinal tract for regulating stomach acid pH, taste, and texture discrimination of the tongue. Studies have shown that it can protect against oxidative stress, free radicals, and heavy metals. Managing director of HMT Biotech Tony Henry told NutraIngredients-Asia that yeast was used as a medium as it helped to provide a higher yield of MT. "Production of artificial MT in yeasts allows to obtain a very pure and active product in sufficient amounts for market supply. "Yeasts have some features that make them an ideal system for production of human proteins, they are eukaryotes, like humans, and are able to produce complex proteins with the correct necessary modifications.

"Also, yeasts have been used for centuries by humans in the production of bread and beer and they are easy to cultivate, totally safe and well known," Henry said. The production technology was granted patent in Taiwan in 2017, in the EU last year, and pending patent in the US and China. The firm is partnering Taiwanese supplement firm Grape King Bio in the actual production of MT and the trial production was completed recently. The production is carried out in fermenters and the MT produced will be purified from the culture medium using chromatographic techniques. "We are now using 200L fermentation which could be considered pilot-run scale, however we have to produce at least three to four batches, and we will also be producing at one ton which should be considered commercial scale within the next four to six weeks."

## Seniors' market

The senior population is one of the target consumer groups, since the level of MT in the body would decrease along with age. The firm hopes to sell the ingredient for use in nutraceutical products in the B2B market by the end of this year. Henry said that the firm had been in touch with leading US supplement brands for commercial partnerships. However, before further developments could take place, the firm would need to go through the New Dietary Ingredients (NDI) notification process with the US FDA. He also said that securing NDI would also help the firm market its MT to the Asian markets. "We will need to get the NDI from the US FDA. Once we have that, it is also easier to enter the Asian markets," he said.



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## Scientists create butter-like spread with 80% water

By Mary Ellen Shoup 21-Aug-2019  
-Food Navigator

Cornell University food scientists have created a low-calorie butter-like spread that consists of 80% water and minuscule drops of vegetable oil and milk fat, mimicking the look and texture of dairy butter without the use of artificial stabilizers.

A tablespoon of the low-calorie spread contains 2.8 grams of fat and 25.2 calories. By comparison, butter is typically 84% fat and about 16% water, and has about 11 grams of fat and nearly 100 calories per tablespoon. Low fat spreads have approximately 40% and reduced fat spreads contain typically 60% fat. "Imagine 80% water in 20% oil and we create something with the consistency of butter, with the mouthfeel of butter and creaminess of butter," said food science professor and senior author of the study (published in the journal ACS Applied Materials & Interfaces), Alireza Abbaspourrad.

Abbaspourrad acknowledges that emulsifying water and oil is nothing new but the specific technique researchers used is different. To create the water-based buttery spread, scientists used high-internal phase emulsions (HIPE) by which "we keep adding water to that oil until the final composition is 80% water and 20% oil," said Abbaspourrad. "It's a completely different formulation. Since the HIPE technology features high water-to-oil ratios -- while simultaneously delivering unique texture and functionality -- it can play a role in providing healthier

solutions for consumers," added lead author of the study Michelle C. Lee, a doctoral candidate in Abbaspourrad's research group.

### Is there still a market opportunity for spreads?

Consumers have been embracing fats in a variety of formats including whole-fat dairy products and butter, increasingly turning their backs on low-calorie alternatives such as margarine. Margarine/spreads sales were down -4.5% in 2017 and declined another -3.1% in 2018, according to IRI Total U.S. MULO sales data. These declines can largely be attributed to the processed nature and artificial ingredients associated with many margarine and spreads products, attributes consumers are avoiding, John Crawford IRI VP of client insights, dairy, previously noted.

The low-calorie butter spread developed by the team of Cornell University's food scientists can appeal to consumers' desire for shorter ingredient decks as the spread contains just a few ingredients (water, vegetable oil, and milk fat) and is free from artificial preservatives and stabilizers typically used in spreads products, noted researchers.

In addition, the water-based spread contains a low saturated fat content compared to whole-fat butter and other oils. "Essentially, we can create something that makes it feel like butter -- and instead of seeing a lot of saturated fat, this has minute amounts," said Abbaspourrad.

### But is fat back?

Despite the catchy headline that 'fat is back', many leading nutrition experts argue that saturated fat still carries nutritional baggage that should not be ignored. As Dr David Katz, MD, MPH, FACPM, FACP, FACLM, founding director of Yale University's Yale - Griffin Prevention Research Center, and

president of the American College of Lifestyle Medicine said at the 7th International Congress on Vegetarian Nutrition (ICVN) last year: "Saturated fat has never been exonerated." Dr Katz cited the American Heart Association's presidential advisory, which concluded that "lowering intake of saturated fat [butter, lard, beef tallow, palm oil, palm kernel oil, coconut oil] and replacing it with unsaturated fats, especially polyunsaturated fats, will lower the incidence of cardiovascular disease," Katz said. Despite this, butter volume sales increased 5% last year, according to IRI data. Possibility for plant-based and fortified formulations Abbaspourrad added that food chemists can adjust for taste, preferences, and health. "We can add milk protein or plant-based protein, and since the water acts like a carrier, we can adjust for nutrition and load it with vitamins or add flavours," Abbaspourrad said.

## Smart speakers and voice shopping 'set to drive the next wave of grocery e-commerce'

By Katy Askew 19-Aug-2019 -Food Navigator

The digital commerce space is evolving at pace. Smart speakers like Google Home and Amazon Echo are 'set to drive the next wave of FMCG and grocery e-commerce', according to new research.

New data reveals that 60% of UK smart speaker owners have used them to make a purchase in the past year. In fact, the survey commissioned by AI data-driven



agency Artefact revealed almost a quarter said they had done so in the past week. The research also found that around one-third of smart speaker owners interact with brands via their device. The companies that people say they have interacted with are dominated by tech brands, especially Amazon. But people also reported communicating with takeaway services such as Dominos and – significantly for FMCG – supermarkets like Sainsbury's. 'This represents a huge opportunity' While the technology is still in its relative infancy, ownership of smart speakers is no longer the niche preserve of early adopters. Indeed, four in 10 UK households already own smart speakers. "This represents a huge opportunity," Sarah De Martin, managing director at Artefact, told FoodNavigator. "Voice gives brands a unique opportunity to interact with and engage with consumers on a one-to-one basis." De Martin said that currently voice isn't something any food or beverage brand has 'really cracked'. However, she suggested it will prove a 'real differentiator' for those who get it right. This means thinking about how to integrate voice tech into a broader cross-channel strategy. In particular, De Martin warned against jumping on the bandwagon with a 'gimmicky voice skill'. "If you're giving your brand a literal 'voice' for the first time you need to make the right impression and offer something that's genuinely useful in supporting and supplementing other channels in the marketing mix," she stressed.

Artefact worked on developing a 'shopping list assistant' for French supermarket Monoprix. "It feeds into the multi-channel offer to recommend additions to customers' basket based on their previous purchases and behaviour. It was a significant undertaking. It not only involved sophisticated voice recognition and AI algorithms, but also meticulous cross-referencing and mapping of the entire

Monoprix inventory at SKU level. "We also needed to work closely with the brand owner to define what the service would sound like, the tone, the gender, the accent. It would be an even bigger job if we'd needed to localise it across market. Developing a truly useful voice service requires a huge commitment – a multi-disciplinary team, time and dedication. However, it's time well spent and Monoprix saw a significant uplift in attracting new customers." Rob Carpenter, founder and CEO at Valyant AI, also believes the potential of voice tech for brands is transformative. "The opportunities are massive; everything from optimising overhead, increasing average order size, employee stability, reducing costs related to hiring and firing, reducing fraud, bringing data driven approaches to marketing and up-sells. Voice technology and, more broadly, digital employees are going to be akin to opening up Pandora's box in terms of challenges and opportunities."

#### Voice search: boost or bust?

Search optimisation that reflects natural speech patterns will become vital for brands, which will come under more pressure than ever to come out on top of the search page. This can potentially favour bigger brands. "Voice plays to our natural speech patterns. If you go into a cafe, you're much more likely to ask for something specific – a coke, rather than a soda. Alternatively, we would ask what soft drinks they offer. If you're Coca Cola you'd want to be at the top of that list and search optimisation for voice will become an increasingly significant consideration," De Martin explained. At the same time, voice search also presents a significant threat to brands. Carpenter suggested voice tech will effectively shrink the shelf space available to grocery brands and restrict their ability to convey information to consumers. "Voice search is potentially one of the bigger threats facing brands over the next decade.

Customers are generally turning to voice to have their needs met in a quick and efficient manner. With online search, customers can review an entire page of products and will make purchase decisions based on things like pictures, reviews, shipping times, etc. With voice, customers likely only want one to three options presented, and they'll making buying decisions based on extremely quick sound bites. "In essence, the shelf-space shrinks from dozens on a physical store shelf, to half a dozen on a web page to only two or three with voice. How to be ranked in these two or three options and what to say is going to be extremely important to brands in the near future," he predicted.

#### Voice is a 'viable channel'

While voice might not be the defining channel for consumer communications or purchases today – chances are that in the very near future it will be. The rapid development and rollout of the tech means brands risk falling behind if they adopt a 'wait and see' approach. "Everyone needs to start thinking seriously about voice as a viable channel. An analogy would be brands that didn't embrace mobile quickly enough - you can't afford to play catch-up," De Martin warned. She also expects fast uptake among key consumer groups such as Gen Z and Millennials: "You also need to bear in mind that voice search launched on mobile devices a decade ago. A generation is growing up with voice and what might seem 'unnatural' to older people will inevitably become a standard means of interaction with the digital world." Brands that are preparing for an increased adoption of voice tech still face a number of technical hurdles, Carpenter added. First and foremost, speech-to-text – or the ability to understand what a customer has said is not 'solved'. "It's critical that brands test how adept the major speech-to-text platforms are at accurately transcribing each their product names. Businesses should test their



brands on the major platform and look at their accuracy with accents, colloquialisms and various languages. If their accuracy isn't great, brands should consider building their own language models, and then making them available to developers, just like brand identity items," he suggested.

### Three strategies for the Indian nutrition industry to secure success in face of limited consumer contact

By Pearly Neo 17-Jul-2019  
-NutraIngredients Asia

Stronger scientific evidence for products, a focus on regionalisation and the education of both consumers and the medical sector are three key factors for success in the nutrition industry in India.

Convening at our second Healthy Ageing APAC Summit in Singapore, these were the views shared by Amit Srivastava (CEO of government-linked incubation hub Bio Valley), K.V. Rambabu (CEO, Pulsepharma), Raktim Chattopadhyay (Founder, Esperer Bioresearch) and Dr Vivek Srivastav (Director, Development Centre Enteral Nutrition, NESEA, Fresenius Kabi India). The session was chaired by Koe Ting Min, Editor of our sister title NutraIngredients-Asia. Here are the key takeaways from the discussion:

#### Stronger scientific evidence

According to Rambabu, nutraceutical manufacturers in India are constrained by the fact that they need to access consumers through the medical sector as a result of local consumption trends. "Many consumers are unwilling and averse to taking pills for supplementation, [so] we have to sell through the medical sector where doctors will balance between drug therapy and [supplementation] therapy," he said. "It is very difficult because we do not have direct access to the consumers. We end up having to



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educate the doctors to prescribe, but they have their own constraints as they can't prescribe too many pills – consumers are averse to that as well." Srivastava added that as compared to other countries like China, which depend a lot on social media to promote new nutraceuticals, Indian consumers require much more scientific evidence to back up a product before putting any faith in it. "Based on a consumer study we did, the top two sites that Indian consumers consult whenever they see new products were the National Center for Biotechnology Information (NCBI) and the Indian Council of Medical Research (ICMR)," he said. Both sites mentioned are platforms that mainly carry scientific research papers, showing that these consumers place a great deal of importance on scientific evidence from such channels.

#### Regionalisation

Regionalisation or localisation was also mentioned as an important factor to draw the market, as well as to obtain approval for products. "Regionalisation is very important in the Indian nutraceutical markets, no matter what segment you are looking at targeting – often, government regulators will ask specifics about what will happen if such and such a product is applied in the Indian market," said Srivastava. This is also important in terms of ingredient utilisation – the panel revealed that companies are encouraged to use ingredients of Indian origin, as well as those which

have results that are already on record locally. "An example is one of our energy drinks – because we found caffeine to have limited benefits for the human body, we regionalised these drinks by using an alternate ingredient, the Indian ginseng ashwagandha to provide energy," said Rambabu. "We found Indian ginseng to not only be as effective as caffeine, but also adaptogenic and capable of handling stress, so we intend to target these drinks at corporate working world consumers who face high levels of work stress," he claimed.

#### Education and strategy

Despite the challenges, the panel also cited several examples of nutraceutical brands that have managed to achieve success based on the current common model of selling through the medical sector. "Revital first built their endorsement through medical professionals, and later successfully pushed this through to selling directly to consumers after confidence had been built up in their products," said Srivastava. Rambabu mentioned one infant formula brand as having a similar story in the country, which is now selling direct to consumers after having seen successful endorsement by doctors in the country. "There is much to be done in terms of education, and [based on this model], we need to mostly still educate the doctors for now, and not so much the consumers yet," he added. According to Rambabu, the importance of consumer education was still a major factor that should not be ignored. "In India, the challenge is not so much the availability of nutrients, but the consumer knowledge of what to eat and what not to eat," he said. Srivastava on the other hand felt that it would be most important to convince dietitians in hospitals about the relevant products to achieve success. "If the dietitians are convinced of the product, 75% of your issues are solved," he claimed.

# REGULATORY NEWS

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## Microplastics pose minimal health threat, but more effective studies are needed, stresses WHO

22 Aug 2019 Nutrition Insight

The long-awaited findings of the World Health Organization's (WHO) assessment of microplastics in the environment have been published, with the organization indicating that the impact on human health appears to be minimal at current levels.

At the same time, WHO has

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stressed that it was working from “limited information” and that there is a pressing need to establish more standardized methods for measuring microplastic particles in water; more studies on the sources and occurrence of microplastics in freshwater; and the efficacy of different treatment processes.

According to WHO's analysis, which summarizes the latest knowledge on microplastics in drinking water, microplastics larger than 150 micrometers are not likely

to be absorbed in the human body and uptake of smaller particles is expected to be limited. Absorption and distribution of very small microplastic particles, including in the nano-size range may, however, be higher, although “the data is extremely limited.”

The WHO assessment was launched in response to a study published by New Orb Media in May last year, which found potentially harmful plastic particles in the water bottles of 11 leading global brands, including Dasani (Coca-Cola), Epura (PepsiCo), Aqua (Danone) and Nestlé Pure Life and San Pellegrino (Nestlé). Exclusive testing was conducted on more than 250 bottles from nine different countries, with 93 percent found to have contained plastic debris the size of the width of a human hair, including polypropylene, nylon, and polyethylene terephthalate (PET).

Although there is insufficient information to draw firm conclusions on the toxicity related to the physical hazard of plastic particles, no reliable information suggests it is a concern. “We urgently need to know more about the health impact of microplastics because they are everywhere, including in our drinking water,” says Dr. Maria Neira, Director, Department of Public Health, Environment and Social Determinants of Health at WHO. “Based on the limited information we have, microplastics in drinking water don't appear to pose a health risk at current levels. But we need to

find out more. We also need to stop the rise in plastic pollution worldwide.”

The potential hazards associated with microplastics come in three forms: physical particles, chemicals and microbial pathogens as part of biofilms. Based on the limited evidence available, chemicals and biofilms associated with microplastics in drinking-water pose a low concern for human health, according to WHO. Although there is insufficient information to draw firm conclusions on the toxicity related to the physical hazard of plastic particles, particularly for the nano-size particles, no reliable information suggests it is a concern.

Microplastics, everywhere Alistair Boxall, Professor in Environmental Science at the University of York, UK, tells PackagingInsights that he is not surprised by the findings. “We know microplastics are everywhere, even in the arctic, so I think it is inevitable that they will find their way into drinking water and food. Recent work has also detected microplastics in human feces showing that we are exposed,” he says.

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In October of last year, Boxall published an investigation into the published literature on microplastics, indicating “significant gaps in our understanding of the effects” of the less than 5mm size plastic particles on the environment. Boxall and study co-author, Emily Burns, called for “better quality and more holistic monitoring studies alongside more environmentally realistic effects studies on the particle sizes and material types that are actually in the environment.”

“There is a very large amount of research on microplastics, but most of this to date has focused on marine systems. Only recently have scientists started to look at other systems such as rivers, soils and drinking water. One of the big challenges we have is with how to analyze these things.

Current methods only get down to a few microns in size so we are probably missing all the smaller particles, for example, nanoplastics that are likely to be present and are also of greater toxicological concern,” Boxall explains.

WHO is calling for a further assessment of microplastics in the environment and their potential impacts on human health, following its release of an analysis of current research related to microplastics in drinking water. The organization also calls for a reduction in plastic pollution to benefit the environment and reduce human exposure.

This week, plastic fibers were identified in rainwater samples from the rural Rocky Mountain National Park, US, further highlighting the ubiquitous nature of plastic fibers

and particles.

Microplastics in drinking water: How does it happen?

Microplastics may enter drinking water sources in several ways: from surface run-off (for example, after

a rain event), to wastewater effluent (both treated and untreated), combined sewer overflows, industrial effluent, degraded plastic waste and atmospheric deposition, WHO explains. Surface run-off and wastewater effluent are recognized as the two main sources, but better data are required to quantify the sources and associate them with more specific plastic waste streams.

On the issue of how microplastics are entering bottled water, Boxall believes that it is still “a bit of an unknown. It will depend on where the source water is obtained and the packaging process,” he says. “For bottled waters, some particles could be slipping through the treatment process used on the source water and there might be inputs from the packaging process and the bottle itself.” Microplastics are ubiquitous in the environment and have been detected in a broad range of concentrations in marine water, wastewater, fresh water, food, air and drinking water, both bottled and tap water.

In the opinion of Jeroen Dagevos, Head of Programs at the Plastic Soup Foundation, plastic bottles and caps that are used in bottled water may indeed be a source of microplastics in drinking water. “PET and PP were the most found plastics in bottled water and the bottle and cap are made of these,” he tells PackagingInsights. “I suspect though that, in Europe at least, drinking water might not be the main contributor to what gets into the body but food and airborne exposure (for example, when you open the door of a tumble drier you will likely get a dose) are probably more important. In regions with

poorer drinking water treatment it could be a much more important exposure route,” Boxall adds.

Where do we go from here? WHO recommends drinking-water suppliers and regulators prioritize removing microbial pathogens and chemicals that are known risks to human health, such as those causing deadly diarrhoeal diseases. This has a double advantage: wastewater and drinking water treatment systems that treat fecal content and chemicals are also effective in removing microplastics.

Wastewater treatment can remove more than 90 percent of microplastics from wastewater, with the highest removal coming from tertiary treatment such as filtration, WHO suggests. Conventional drinking water treatment can remove particles smaller than a micrometer. A significant proportion of the global population currently does not benefit from adequate water and sewage treatment. By addressing the problem of human exposure to faecally contaminated water, communities can simultaneously address the concern related to microplastics.

Meanwhile, WHO is calling for significant improvement in the quality control of future microplastic studies after its commissioned study concluded that present studies are not fully reliable. Results should therefore be interpreted with caution. For example, in two drinking-water studies and for a subset of smaller particles in a third study, no spectroscopic analysis was conducted to confirm that the particles identified were plastic.

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Four of the 52 studies that scored highest for quality were published in 2017 and 2018, indicating some improvements in quality control. The quality control areas requiring the most improvement include sample treatment, polymer identification, laboratory preparation, clean air conditions and positive controls.

In addition to improved quality control on microplastic studies, WHO is also calling for a crackdown on plastic pollution. Irrespective of any human health risks posed by exposure to microplastics in drinking water, measures should be taken by policymakers and the public to better manage plastics and reduce the use of plastics where possible, to minimize plastics released into the environment because these actions can confer other benefits to the environment and human well-being, WHO stresses.

How can a reduction in plastic pollution be achieved? According to Boxall, the simple answer is to phase out single-use plastics and develop improved recycling systems for multi-use plastics. "We should also look to develop ways in which can catch particles at source, for example, filters on washing machines to collect particles generated by clothing and filtration systems on highways to remove tire particles." Plastic bottles and caps that are used in bottled water may be sources of microplastics in drinking water.

In May, the Council of the EU officially adopted measures proposed by the European Commission to tackle marine litter by banning the 10 single-use products most commonly found on European beaches. This includes cotton bud sticks, cutlery, plates, straws and stirrers and also incorporates abandoned fishing gear and oxo-degradable plastics. The Member States will now have two



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years to transpose the legislation into their national law.

"We could also introduce tertiary treatments on wastewater treatment plants – this would not only remove the microplastics but also the many other micropollutants that occur in the environment that are probably more toxic," Boxall explains. "There is talk about moving towards biodegradable plastics – while this will help exposure in the oceans, I am not convinced that it will help rivers and drinking waters – we will just see other polymers in our drinking water," he adds. Dagevos also highlights the need to not add microplastic to products intentionally. "This is still happening with, for example, cosmetics, cleaning agents and agricultural products."

"We need to avoid the degradation of plastics into the environment. Microfibers from clothes are a big source – on average 9 million fibers per 5 kg wash. Let's develop better yarn, pre-wash and use protecting coatings," he advises. Given that humans can be exposed to microplastics through a variety of environmental media, WHO has initiated a broader assessment of microplastics in the environment. A future report will characterize the potential human health risks due to total microplastic exposure from the environment, including through food and air.

By Joshua Poole

Aging is not always healthy

Healthy aging consumers are either looking to grow older with their health intact or are looking to address concerns that arise in later

life years; both need substantiated, truthful information on product benefits.

Jim Lassiter Aug 19, 2019 Natural Products Insider

Consider the two aspects to healthy aging and the soft dividing line along a time continuum: Those who aim to prevent unhealthy aging and those looking to correct damages of the past when their bodies start to react to the aging process. Time has given us advanced knowledge of the foods that offer potential benefits, and smarter food choices are more available. Younger consumers are more likely to be open to a variety of positive-health foods that set the stage for healthy ageing. You are what you eat, as they say.

The second leg of this walk down the aging timeline may start with stiffness in joints and other benign but bothersome occurrences, like random aches. Key or additional nutrients also help in this stage. The roles some of these nutrients play in slowing down the inevitable (not preventing) should be adequately communicated now, so as the population continues to age, more will benefit. These challenges are both historic and emerging. The historic challenge remains in the communication of truthful information of the potential benefits of these nutrients.



The desire from time immemorial is to sell herbal drugs. However, drug claims are not an option for supplements in today's regulatory landscape. The requirements and limitations for claims for conventional foods are even more limiting. The ability to deliver the message has always been hampered, and no amount of formula registration or other approval process is going to stem that constriction.

Here's the encapsulation of it all. The population can be divided into a couple of basic groups: those who are old, and those who will be old. These different markets have different needs. The younger market needs to be informed about the long-term benefits of continual consumption of healthy foods and supplements. The younger segment of the population should be encouraged to start now. Brands should consider that this market will be more concerned about long-term benefit than short-term results. For marketing to those approaching the distant horizon, brands should describe the conditions common in ageing in broad terms. Tell them of the support the ingredients offered have for their immediate needs, and presto: the product becomes an illegal drug. The opportunities for claims regarding those who have already aged are fewer than for those just starting to embark on aging. Good science supports a variety of age-related claims, but bad science also exists. Brands should evaluate data they intend to use to support claims. Armed with that information, it is only a matter of effectively communicating to the different segments of the market. The regulatory challenges are mitigated with proper review of the substantiation and science behind the claims, and provision of the claims in a manner that fits inside the boundaries of current regulatory allowance.

As chief operating officer, Jim Lassiter oversees all consulting

operations at REJIMUS ([rejimus.com](http://rejimus.com)). He has more than four decades of experience in quality control (QC), and government and regulatory affairs throughout the pharmaceutical, dietary supplement and natural product industries with organizations such as Nutrilite, Robinson Pharma, Irwin Naturals, Chromadex, the American Herbal Products Association (AHPA) and the Council for Responsible Nutrition (CRN). A respected author and speaker, Lassiter has served on numerous industry and trade boards.

### Hazard reduction: FSSAI mandates compulsory third-party food safety audits in six 'high-risk' categories

By Pearly Neo 27-Aug-2019 - Food Navigator Asia

The Food Safety and Standards Authority of India (FSSAI) has issued a formal order mandating compulsory third party food safety auditing for all food companies that deal in 'high-risk' product categories in hopes of reducing the need for frequent government inspections.

According to the order document, the agency has designated six such 'high-risk' food categories: Dairy, meat, fish, eggs, foods for nutritional uses (e.g. infant nutrition), prepared foods and products related/sourced from these. "The food businesses subject to mandatory food safety auditing [in these categories] shall get the business audited by a recognized auditing agency at intervals as specified by FSSAI," said FSSAI Executive Director (Compliance Strategy) Dr Shobhit Jain, who issued the order. "This is in accordance with the Food Safety and Standards (Food Safety Auditing) Regulations, 2018."

FSSAI added that these food safety audits would help to 'reduce the regulatory Food Safety Inspections

conducted by Central or State Licensing Authorities'. "Satisfactory audits will lead to less frequent regulatory inspections by Central or State Licensing Authority, except for regulatory sampling. This will strengthen food safety surveillance system and encourage self-compliance," said the agency. "In the case of complaints against the companies, or when it comes to the knowledge of the Food Authority (FSSAI) that public health and safety is at risk, the Food Authority shall have the discretion to undertake more frequent inspections."

### Audit frequencies

According to the FSSAI Auditor Manual released earlier this year, the frequency intervals for each company would differ according to product categories, and further varied based on the Audit Score Range they achieved during each audit. For example, a dairy company that scores an Audit Score Range of 81% to 100% would be subject to a food safety audit once every 12 months, but 51% to 80% would mean an audit once every nine months, and anything less than 50% would mean an audit every six months. The same applies to companies that fall under any of the six categories classified as 'high-risk', but the intervals are generally longer

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(18 months, 12 months, six months) for all other categories, e.g. spices or non-dairy beverages. Need-to-know audit details for food firms FSSAI also published a separate list of 23 government-recognised auditing agencies located throughout the country, 21 of which were licensed to conduct audits 'all over India'. "Agencies that wish to apply to be recognised by FSSAI as an auditing agency will be prescribed a fee of INR30,000 (US\$419) for a period of three years," added FSSAI.

However, despite the now-compulsory implementation of food safety audits for the food companies mentioned above, there is no controlled auditing fee structure for either the food firm or auditors to adhere to. "The audit fee will be as per mutual agreement between the auditing agency and the food company," said FSSAI. "However, guidelines regarding the fee structure may be issued as and when required."

### Increased 'health claims' on children's food belies products' poor nutritional quality, study reveals

By Elizabeth Crawford 15-Aug-2019 - Food Navigator Asia

The percentage of children's products making front-of-pack nutritional and 'better-for-you' claims has increased significantly in the past decade, as has the use of 'fun appeals,' but the nutritional quality has not, according to a recent study that prompted researchers to call for stricter marketing guidelines for children's products.

Nearly a decade after the World Health Organization developed guidelines restricting products marketed to children based in part of sugar, fat and salt content, a systematic review published Aug. 9 in the journal *Nutrients* found 88% of products marketed to children in 2017 do not meet WHO's 2010 standards. This is the same

percentage as in 2009, according to the study which compared products marketed to children in Canada in 2009 to 2017.

A closer look at the products' nutritional values show that not only did the percentage of products failing to meet WHO standards fail to improve, but that the amount of sugar actually increased, while fat stayed the same and sodium decreased. "By far, the most common nutrient threshold exceeded was sugar, with 72.9 and 77.3% of products having excess sugar in 2009 and 2017, respectively," and 16% of the products qualified as high in fat in each data set, the researchers note. "Products with excess sodium per serving side dropped over time, and this was statistically significant, with 12.1% of products in 2009 to 5.3% of products in 2017," they added.

The researchers also pointed out that some companies changed products so that they appeared to be more nutritional, but in fact were not. For example, six of the 14 identical products in each data set had smaller serving sizes in 2017 than 2009 but this changes "was always accompanied by an increase in at least one sugar, sodium or fat per 100 g even if the respective nutrient content per serving size did not change or decreased."

### Appealing to parents

While the nutritional quality of the products overall remained the same or were less healthy, changes in the front of pack claims tell a different story. The study found products with front of pack nutrition claims "increased dramatically" from 31.4% in 2009 to 85.6% in 2017 – likely in an effort to appeal to parents' desire to offer their children something that they perceive as healthy. However, many of the added claims did not reflect the actual healthfulness of the products. Rather, both gluten-free and peanut/nut-free

claims were four times more common in 2017 than 2009, while claims of no artificial flavors or colors also "jumped significantly" from 11.6% to 35.3%.

Alternatively, the study reveals that "source of" claims, such as vitamin D or calcium, and organic claims became less common in 2017. Nutrient content claims remained stable between 1 and 3%, it added. Other claims that implied a product is healthy but which are not connected to nutritional value, such as "better" and "good," also increased in 2017. These claims, such as Kellogg's Simply Good! Claim or Dare's Made Better! Claim, appeared on more than one of every three products in 2017, the study reports.

### Appealing to kids

Claims and marketing tactics that likely would attract children also increased significantly from 2009 to 2017, according to the report. For example, it found "child-appealing fonts increased from 86.4 to 94.7%" and cartoon images on the front of the package jumped from 69.2 to 85.6% from 2009 to 2017, the study reported. Other tactics designed to appeal to children seem to have fallen out of favor, though, according to the study. It found kid-sized packages and the use of games or activities decreased. Reflecting on the study's findings, the researchers concluded there is a "critical need to consider the regulation of packaging – both in Canada and internationally – as part of the strategy for creating an 'enabling food environment' for children" that encourages consumption of healthier products.

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## Providing clarity about the new wave of GMOs

Dana Perls, Aug 19, 2019 Natural Products Insider

A new wave of GMO (genetically modified organisms) ingredients is already making its way onto the market. Agribusiness companies are trying to rebrand genetic engineering with terms such as synthetic biology, CRISPR, gene editing and gene silencing. These terms all describe new methods of genetically engineering crops, animals and ingredients that producers are rushing to get onto the market.

Despite claims from the biotechnology industry, these products are anything but natural, healthy or sustainable. Consider genetically modified apples designed to never brown, but which require more pesticides. Or the Impossible Burger, which claims to be environmentally beneficial, but which is made with GMO proteins and GMO Roundup Ready soy, both risky to our health and the environment. Calyso soybean oil self-proclaims to be non-GMO, but has been genetically engineered with new gene editing techniques. The market trends are clear. Consumers want healthy, toxin-free organic foods, and they want to know exactly what they are eating. Many brands are listening and have taken steps to clean up their supply chains and replace GMOs with natural ingredients. But these newer genetically engineered items are not labeled, and many have found their way into supply chains and onto grocery shelves. While some well-meaning companies may truly not know that they are sourcing these new GMOs, the giants of the

agribusiness industry know what they are doing.

That's why they are paying for sophisticated PR campaigns to cover up the science about GMOs and pesticides. The industry is deceiving consumers to maintain their vice grip on our food system and protect their corporate profits. These new GMOs are unpredictable and largely untested. Studies show that genetic engineering, particularly new techniques like CRISPR, cause surprise genetic errors and problems for organisms and ecosystems. Once in the environment, these new genetically engineered organisms are uncontrollable and could cause irreversible ripple effects. Many of these new GMOs may rely on toxic pesticides linked to cancer and be responsible for destroying bee populations around the world. There are holes in the science about health impacts for consumers, and antiquated federal health assessments cannot adequately determine safety. Many new GMO products are intended to replace plant-based commodities, such as vanilla, stevia, coconut and cannabinoids. Not only do people's livelihoods around the world depend on growing these valuable crops, but many of the crops are culturally important and ecologically critical.

Companies interested in providing people with real non-GMO and organic ingredients are uniquely positioned to lead on this issue. They can help lead the fight for a more sustainable and healthy food system and protect people's right to choose what they are eating. The Non-GMO project and the USDA organic standards already exclude ingredients derived from genetic engineering. But for non-certified ingredients, companies need to demand transparency and ask questions at every step of the supply chain. We need to see clearly who this technology is benefiting.

These unlabeled new GMOs may already be in the supply chain, so it's critical that companies hold themselves accountable and protect the integrity of the natural foods industry by ensuring they know what they are sourcing. Companies interested in avoiding the potential risks of new GMOs should be asking their suppliers detailed questions. For example: Are any ingredients derived from genetic engineering, including new gene editing techniques like CRISPR? Are any ingredients produced using fermentation or bioengineering? Are any ingredients derived from yeast, algae or enzymes? Does the supplier know from where the ingredients are originally sourced? Would the supplier sign an affidavit confirming the ingredients are produced through processes that do not use genetic engineering techniques?

If a supplier cannot confirm that an ingredient or product was made without genetic engineering processes, the company should ask for more information or source an ingredient that is traceable back to its origin and preferably organic. Companies need to ensure the authenticity of their products and claims and should build public confidence in their roles as champions of transparency, authenticity and safe, sustainable products.

If we are serious about climate change, health and sustainability, we need to look holistically at our food system and stay focused on sourcing real, truly natural and organic ingredients that consumers want. We are at a crossroads within our food system. The direction we choose to take will have profound effects on the future of food—how ingredients are made and what people eat. By listening to consumers, thoroughly screening for these new GMOs and sourcing organic, companies can lead the fight for a healthy and transparent food system and protect the integrity of what's truly natural.

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