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- 127-136 **β -SITOSTEROL DECREASES BUT ITS INTAKE FREQUENCY HAS NO EFFECT ON PLASMA CHOLESTEROL LEVEL**
Rui Jiao, Fang-Fei Yu, Yu Huang and Zhen-Yu Chen

ABSTRACT: *It has been shown that dietary phytosterols intake is inversely related to plasma total cholesterol (TC) and low-density lipoprotein cholesterol (LDL-C) concentrations. The present study investigated effect of β -sitosterol intake frequency on plasma lipoprotein profile and the gene expression of transporters, receptors and enzymes involved in cholesterol metabolism. Thirty-three hamsters were divided into three groups with the control hamsters being gavage-administrated 3 mg cholesterol 3 times per day, whereas the second group being gavage-administered 3 mg β -sitosterol with 3 mg cholesterol 3 times per day (S-3) and the third group being gavage-administered 9 mg β -sitosterol with 3 mg cholesterol for one time and 3 mg cholesterol for the other two times per day (S-1). Results demonstrated that compared with the control group, hamsters gavage-fed β -sitosterol had a significant decrease in plasma TC and non-high density lipoprotein cholesterol (Non-HDL-C) concentration, but there was no significant difference between S-3 and S-1 groups. Real time PCR analysis revealed that the cholesterol-lowering activity of β -sitosterol was mediated by its inhibition on the intestinal cholesterol absorption with up-regulation of Niemann-Pick C1 like 1 (NPC1L1), ATP binding cassette transporters 5 and 8 (ABCG5/8) and microsomal triacylglycerol transport protein (MTP), but no significant difference was found between S-3 and S-1 groups. It was concluded that β -sitosterol was effective in reducing plasma cholesterol level and for a given dose of β -sitosterol, the administration frequency had no effect on plasma lipoprotein profiles.*

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- 137-148 **PLANT STEROLS - A DIETARY APPROACH FOR EFFECTIVE BLOOD LIPID LOWERING AS PART OF A HEART HEALTHY DIET**
Elke A. Trautwein, Isabelle Demonty and Rouyanne T. Ras

ABSTRACT: *Plant sterols (PS) are naturally occurring compounds found in foods of plant-based origin. Despite their structural similarity with cholesterol, PS are not absorbed in significant quantities; their intestinal absorption is less than 2% as compared to 30-60% for cholesterol. PS partly inhibit intestinal cholesterol absorption, which is the underlying mechanism of action responsible for their cholesterol-lowering effect. The cholesterol-lowering action of PS was already known in the 1950s and to date several meta-analyses have summarised the evidence for their total and LDL-cholesterol (LDL-C) lowering effect in intervention studies with different populations consuming a variety of plant sterol-enriched foods. The effect is dose-dependent with an intake around 2 g/day resulting in a reduction in LDL-C of about 10% on average, while doses above 3 g/day do not add much additional benefit. The cholesterol-lowering effect of PS is established within a few weeks and is maintained over longer periods as established in long-term efficacy studies lasting up to 85 months. The effect of PS is additive to that of a lipid-lowering diet and is also effective on top of treatment*

with lipid-lowering drugs like e.g. statins. PS-enriched foods can contribute to increasing the effectiveness of a heart healthy diet in lowering LDL-C and offer a valuable addition to coronary heart disease risk reduction strategies. PS and stanols, the saturated counterparts of PS, are among the first food compounds for which the European Food and Safety Authority approved a disease risk reduction health claim.

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149-156 HYDROLYSATES OF SWIM BLADDER COLLAGEN FROM MIIUY CROAKER, *MIICHTHYS MIIUY*, ENHANCES LEARNING AND MEMORY IN MICE

Xin J. Lu, Jiong Chen, Mei Z. Chen, Ji N. Lü, Yu H. Shi and Hao Y. Li

ABSTRACT: *In East Asia, the swim bladder of miiuy croaker, *Miichthys miiuy* (SBM), is a traditional functional food to enhance learning and memory, but this concept is not confirmed by scientific methods. In this study, we isolated and hydrolyzed the SBM collagen (SBMC). Hydrolysates of SBMC were orally administrated for 28 days followed by the measurement of learning and memory in the Morris water maze. Learning and memory were enhanced in the SBMC-treated mice compared with the control. However, the SBMC treatment did not change the swim speed and visual acuity for performance in the water maze of mice. The mRNA expressions of learning and memory related genes were up-regulated in hippocampus of SBMC-treated mice. This study provides a kind of new prospective food to possibly enhance cognition in human.*

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157-160 THE LONG-LASTING ACTION OF DOCOSAHEXAENOIC ACID AMELIORATES INFLAMMATION IN PREADIPOCYTES MORE EFFECTIVELY THAN A SHORT-LASTING ACTION – IMPACT ON CROHN’S DISEASE

Jan Hošek, Veronika Závalová, and Peter Kollár

ABSTRACT: *The aim of this study was to compare the long-lasting and short-lasting effects of docosahexaenoic acid (DHA) on TNF α transcription at lipopolysaccharide (LPS)-stimulated preadipocytes 3T3-L1 and its usage in Crohn’s disease treatment. 3T3-L1 preadipocytes were pre-treated with DHA for either 1 or 24 hours, and then LPS was added. TNF α transcription was measured by quantitative PCR. After a 1-hour pre-treatment, cells decreased TNF α transcription by 31% ($p < 0.05$) and the 24-hour pre-treated cells decreased TNF α transcription by 94% ($p < 0.001$). In preadipocytes stimulated with LPS, the long-lasting action of DHA exerted a stronger effect when compared with the shorter-lasting treatment. However, in both cases DHA significantly reduced TNF α transcription.*

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161-168 BIOLOGICAL EFFECTS OF MISWAK (*SALVADORA PERSICA*)
Yaghma Masood, Mohd Masood, Mohamed Ibrahim Abu Hassan and Fouad Hussain MA Al-bayaty

ABSTRACT: *Miswak (Salvadora persica) is one of the oldest known shrubs, being used by millions of people in various parts of the world as an oral hygiene tool. The reason for its wide use is not only its excellent mechanical plaque-removing efficiency but also its broad range of Biological properties. Most importantly, it has good antibacterial and antifungal effects that are responsible for maintaining good oral health including prevention of dental caries and periodontal disease. It also raises the plaque pH and stimulates salivary flow, which play synergistic effect in caries prevention. Besides this, it has protective effect on human leukocytes, inhibitory effect on platelets aggregation induced by thrombin or collagen, increases cell proliferation and promotes wound healing. Some studies have demonstrated its good analgesic, anticonvulsive and sedative effects. Another study also claimed that miswak affects adversely on male and female reproductive system in mice. The purpose of the present article is to provide an overview of various biological effects that will help to understand the importance of this plant and offer suggestions for future research.*

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169-172 **CEREAL BARS, MOOD AND MEMORY**
Andrew P. Smith and Christopher Stamatakis

ABSTRACT: *Research has shown that breakfast cereal consumption leads to a more positive mood and improved memory. The present study investigated the acute effects of having a fibre cereal bar for breakfast on mood and memory. Twenty volunteers (15 male, 5 female; mean age 22 years) were tested at 09.00 following an overnight fast. They carried out a free recall task involving recall of a list of 20 words and rated their mood using bi-polar visual analogue scales. The volunteers then had a 40 minute break and half of the volunteers consumed cereal bars (37g; 606KJ/144KCal; 26g carbohydrate, 1.5g protein; 3.74g fat and 1.5g fibre) at the start of the break whereas the others abstained from eating. Following the break the volunteers repeated the memory task and mood rating. The results showed that consumption of the cereal bar led to a more positive mood (greater alertness; being more happy/sociable; and being calmer). Recall of the list of words was also significantly greater in the cereal bar condition. Overall, the results extend previous findings and show that acute benefits of breakfast can be identified following consumption of a fibre cereal bar.*

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173-184 **CITRUS AS FUNCTIONAL FOODS**
Pilar Codoñer-Franch and Victoria Valls-Bellés

ABSTRACT: *Recent studies have documented a number of health benefits associated with the consumption of citrus. These fruits are predominantly composed of water and have a very low energy density. However, they are some of the most important nutrient-dense foods available. In effect, citrus fruits contain a range of key nutrients such as vitamin C, folate, dietary fiber, minerals (potassium) and phytochemicals, which confer them the health-promoting properties. In recent years, there has been increasing interest in the anti-oxidant capacity of foods. Vitamin C is a major contributor to the anti-oxidant capacity of citrus. However, the major contribution of citrus anti-oxidant activity comes from the combination of phytochemicals and from their synergistic*

action with vitamin C. The major phytochemicals in citrus fruits are the terpenes and phenolic compounds, which possess anti-inflammatory and anti-carcinogenic activity. Carotenoids and limonoids are terpenes that are released in the processing of juices. Citrus is the main source of specific nutrients such as flavanones (hesperetin and naringenin, usually present as glycosides) and the carotenoid cryptoxanthin, which are not present in other fruits in significant quantities. Flavonoids also have a role in cardiovascular protection, inhibiting the formation of atheroma in many steps of its pathogenesis.