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MESSAGE FROM **Ms. SEEMA MODI,**

MANAGING DIRECTOR, HEINZ INDIA PRIVATE LIMITED



In 1922, Elmer McCollum tested modified cod liver oil where vitamin A had been carefully removed. He found that the modified oil cured dogs with rickets. So McCollum came to the conclusion that the factor in cod liver oil which cured rickets was distinct from vitamin A and he called it vitamin D because it was the fourth vitamin to be named. Though it was called a vitamin it does not fit into the typical definition of a vitamin because vitamin D can be synthesised by humans through exposure to UV light. Frequent exposure of the skin to sunlight promotes sufficient vitamin D synthesis without the need for supplements. Vitamin D is a secosteroid, synthesized by skin from sunlight and converted to active form by the kidney and that is what the author states as "efficient way of acquiring vitamin D is to synthesize it endogenously from skin from 7-dehydrocholesterol present in the subcutaneous fat by 30 minutes of skin exposure (without sunscreen) of the arms and face to sun."

We would want to make our readers familiar with work done by Food Safety and Standards Authority of India (FSSAI). The Food Safety & Standards Act (FSSA) was passed by the Parliament in 2006 and after five years, an additional set of regulations called Food Safety & Standards Regulations was introduced. Thus, FSSA has replaced the older PFA along with a few more ordinances, which were also dictating food standards and regulation.

Another equally interesting article is about conditions like Inflammatory Bowel Disease (IBD). IBD is becoming more common in India, especially in the wealthier sections of society. The author states that it could be directly attributed to the complete elimination of parasites such as hookworms from the guts of members of this social segment.

AN APPEAL FROM MANAGING EDITOR - REQUEST FOR EMAIL ID

All of you would appreciate the increase in cost of paper, printing and postage. In addition, **Heinz Nutrition Foundation India**, being a non-profit, non-commercial Trust would be happy to save as much money and protect the environment by not using precious resources like paper and printing ink. With the development of telecommunication and email support, it would be prudent that we send you copies of future issues of **In Touch** through email directly to your personal computer. You can also access them at www.hnfi.org. Please provide us your email ID, and we assure you that it shall not be used for any other purpose.

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VITAMIN D IN HEALTH AND DISEASE



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VITAMIN D SYNTHESIS:

Vitamin D is unique because it is a vitamin synthesised by the body and it functions as a hormone. It exists as vitamin D2 (Ergocalciferol) and D3 (Cholecalciferol). Vitamin D is a secosteroid, synthesised by skin from sunlight and converted to active form by the kidneys. Casual exposure to sunlight (wavelengths 290–315 nm) results in the cutaneous production of previtamin D3. On exposure to sunlight, the UVB photons (290–315 nm) enter the epidermis and cause a photochemical

transformation of 7-dehydrocholesterol (7-DHC) (provitamin D3) to previtamin D3. Previtamin formed is photolabile. Excessive sunlight exposure results in its photoisomerisation to at least two biologically inert products, lumisterol and tachysterol (1). Thus there is no possibility of hypervitaminosis occurring on prolonged exposure to sunlight. Thermodynamically previtamin D3 is converted to vitamin D3 (Cholecalciferol) and is transported to the liver where it is metabolised into calcidiol or 25-hydroxyvitamin D3 [25(OH)D]. Calcidiol has also got steroid-like properties. Serum 25-hydroxyvitamin D is the storage form of vitamin D. 25(OH)D is the most reliable indicator of vitamin D adequacy of an individual. Vitamin D status depicts the vitamin D stores of an individual. The production of 25(OH)D is not regulated and the serum concentration thus reflects both cutaneous synthesis and absorption from diet. This is what is tested routinely for vitamin D deficiency. Calcitriol (1,25-

dihydroxy-vitamin D3) is made from calcidiol in both the kidneys and in other tissues. It is the most potent steroid hormone derived from cholecalciferol. Calcitriol helps in calcium absorption from the intestines and builds bones.

FACTORS AFFECTING VITAMIN D SYNTHESIS

The previtamin D3 synthesised is affected by latitude, season and rotation of earth on its own axis (day and night)—time of day (2). Atmospheric pollution attenuates solar radiation. Dress code, skin pigmentation, and application of sun protection factor (SPF) of 15 reduce the UVB penetration into epidermis by > 95%, thereby limiting the production of previtamin D3 by the skin. With age, the cutaneous 7-DHC levels decline, reducing the skin's capacity to produce vitamin D3. With the increase in solar zenith angle in winter (sun angle becomes more oblique), more UVB photons are absorbed by the stratospheric zone,

and therefore very few of the UVB photons can penetrate to earth's surface to produce cutaneous previtamin D₃. Thus the amount of UVB radiation reaching earth's surface is a function of solar zenith angle, time of day, season of the year, amount of ozone, cloud, aerosols, and latitude and altitude—all influence the cutaneous production of vitamin D₃ (2). Dietary source of vitamin D is limited and available in very few food items. Vitamin D₃ is present in oil rich foods like salmon, macrel and herring.

ACTIONS OF VITAMIN D

Vitamin D orchestrates (coordinates) the 'Ca-vitamin D-Parathyroid hormone endocrine axis'. Besides its pivotal role in calcium homeostasis and bone mineral metabolism, vitamin D endocrine system is now recognised to sub-serve a wide range of fundamental biological functions in cell differentiation, inhibition of cell growth as well as immunomodulation (3-10). It is a steroid that regulates complex system of genomic functions and has a role in prevention of neoplastic transformation. Recent evidences from genetic, nutritional and epidemiological studies link vitamin D endocrine system with diseases like hypertension, diabetes mellitus, myopathic disorders, and proneness to infection, autoimmune disorders and cancer. Vitamin D modulates the transcription of cell cycle proteins, which decrease cell proliferation and increase cell differentiation of a number of specialised cells of the body (osteoclastic precursors, enterocytes, keratinocytes). This property may explain the actions of vitamin D in bone resorption and intestinal calcium transport. The immunomodulatory properties may explain the reported associations between vitamin D deficiency, on the one hand and metabolic diseases such as type 2 diabetes, autoimmune diseases, infections such as tuberculosis and some malignancies, on the other (3-10).

GENOMIC AND NON GENOMIC ACTIONS

The biological action of active form of vitamin D is select, in organs and tissues, through various cognate receptors. "Genomic responses" are mediated by the formation of ligand receptor complexes with super family of steroid hormone nuclear receptor (11). These types of response generally take few hours to days to fully manifest. "Rapid responses" (RR) are

responses which occur in 1 – 2 minutes; they are a thorough variety of receptors located near or associated with plasma membrane or mediated by its caveolae components. 1,25(OH)₂D₃ serves as a chemical messenger to transmit signals and RR (e.g. opening of ion channels) (12). Opening of voltage-gated Ca⁺ and Cl⁻ channels of osteoblasts and rapid migration of endothelial cells, rapid intestinal absorption of calcium (transcaltachia), secretion of insulin by pancreatic β-cells are all examples of RR. Interestingly, different tertiary structures of 1, 25(OH)₂D₃ are used for genomic response and agonist of RR (12).

DEFINITION OF VITAMIN D SUFFICIENCY

Vitamin D deficiency is defined as that level of vitamin D at which the parathyroid hormone starts rising (i.e. when secondary hyperparathyroidism sets in). Secondary hyperparathyroidism erodes bone and maintains normal serum calcium levels. (13) This occurs at a 25(OH)D levels of 20 ng/ml. The maximum calcium absorption in the gut at a 25(OH)D levels of 30 ng/ml

The immunomodulatory properties may explain the reported associations between vitamin D deficiency, on the one hand and metabolic diseases such as type 2 diabetes, autoimmune diseases, infections such as tuberculosis and some malignancies, on the other

is considered as the normal level for any given population.(14-17) Thus, the normal level of vitamin D which is 30 ng/ml and values less than 20 ng/ml is defined as vitamin D deficiency, and values between, 20-30 ng/ml is defined as insufficiency. To convert ng/ml to nmol/l multiplies by factor 2.5.(14-17).

VITAMIN D AND SUNSHINE

It has been a general belief that rickets

and vitamin D deficiency are uncommon problems in India because of abundant sunshine (18). There is, however, now increasing evidence that this is not true. The FAO/WHO Expert Consultation stated that in most locations in the world around the equator (between latitudes 420 N and 420 S), the most physiologically relevant and efficient way of acquiring vitamin D is to synthesise it endogenously from skin from 7-dehydrocholesterol present in the subcutaneous fat by 30 minutes of skin exposure (without sunscreen) of the arms and face to sun (19). The time required to obtain recommended UV dose for adequate vitamin D synthesis is "1 Standard Vitamin D Dose" (SDD) (20). Throughout the year 1 SDD for skin type V (Asians) at 11.50 N is 10-15 minutes, and at 290 N is 10-45 minutes at solar noon, with longer duration in winter. SDD for skin types is collected on MED (Minimal Erythema Dose) (21). Exposure of an adult in a bathing suit to an amount of sunlight that causes a slight pinkness to the skin is known as a 1 MED. It is equivalent to ingesting approximately 20,000 IU of Vitamin D. Clouds, aerosols and thick ozone can reduce vitamin D synthesis and force "Vitamin D winter" even at equator. India is located 8.4 and 37.6° N (22).

VITAMIN D AND BONE HEALTH

Nutrition and bone health is a tale of two nutrients: calcium and vitamin D. Adequate calcium intake along with vitamin D helps to maintain bone mineral mass attained at the end of growth period (peak bone mass). During infancy, childhood and adolescence, increasing dietary calcium intake favours bone mineral accrual. Adequate nutrition and sufficient activity provide mechanical impetus for bone development which may be critical in attaining bone growth potential. Vitamin D and calcium status correlate with increased bone mineral density and have the potential to increase the peak bone mass. Increasing bone mineral content during periods of rapid growth (childhood and adolescence) increases "peak bone mass" and may effectively prevent osteoporosis at later age (23-25).

VITAMIN D STATUS OF INDIAN POPULATION

The summary of various studies on Vitamin D status on Indian population is as follows(25,26):

- All studies from India uniformly point to low 25(OH)D levels in the population despite abundant sunshine in our country
- All studies have uniformly documented low dietary calcium intake compared to Recommended Daily/Dietary Allowances (RDA) by Indian Council of Medical Research (ICMR)
- The vitamin D status of children is very low in both urban and rural population, as per studies. Some of the studies clearly showed that the 25(OH)D levels were directly proportional to the duration of exposure to sunlight. This is evident from the vitamin D status of rural population who were agricultural workers and had their chest and tarso exposed to sunlight compared to the urban population who were white-collared workers. Hence exposure to sunlight has positive effect on the vitamin D status of individuals
- Pregnant women and their new born had low vitamin D status
- Residents of northern tip of India in Kashmir valley had low 25(OH)D levels
- Indian paramilitary forces who had dietary calcium well above the RDA and daily exercises in sunlight in the morning hours had better 25(OH)D levels compared to the civilian counterparts
- Dietary calcium supplementation had positive effect on 25(OH)D levels
- The effect of a single course of loading doses of vitamin D (60,000 IU) doesn't have a lasting effect and a maintenance dose is needed on a long-term basis. There is a need to evolve an Indian therapy protocol which is cost-effective. Vitamin D analogues have a narrow therapeutic window (should be avoided), while agents like cholecalciferol sachets or bolus vitamin D injection have a wider therapeutic window (are more economical). Situations of hypervitaminosis D should be avoided
- Low 25(OH)D levels has its implications of lower peak bone mass and lower BMD compared to west

MEASURES TO IMPROVE VITAMIN D STATUS OF AN INDIVIDUAL

Until more data is available on regulation of fortification of food with vitamin D the following preventive measures could be adopted (25,26).

- Direct exposure to sunlight, at least 30



- minutes/day
 - Good dietary calcium intake (equivalent to one liter of milk and milk products)
 - Supplementation of calcium and Vitamin D to lactating mothers
 - Artificial fortification of infant food products
 - Making daily physical training to children in schools compulsory
 - If on supplements, check for optimum dosage
 - Artificial fortification of food product may have to be considered. The major limitation before making a decision on this issue is on economics and regulation. Considering the huge cost involved, it would be wise to propagate and advocate direct exposure to D-litful sunlight and fortify the food with calcium
 - Food fortification through the nutritious mid-day meal scheme
 - Preventive use of sun screens with SPF greater than 6
 - Outdoor activities of the elderly and aged
- Studies from Pune (Latitude 18.31° N and longitude 73.550 E) have shown that toddlers exposed to sunlight (playing outside) for more than 30 min a day exposing more than 40% of their body surface area have a normal vitamin D status (M: 91.6 nmol/L and F: 67.7 nmol/L)

(three times more) compared with the toddlers who were indoors for most part of the day (M: 32 nmol/L and F: 21.1 nmol/L) (27). Similarly, another study on toddlers in Delhi slums (latitude 28.350 N and longitude 71.120 E) demonstrated that those toddlers who were exposed to sunlight had better Vitamin D levels (~ 100 nmol/L) compared to those who were not (~20 nmol/L). Interestingly, authors of this study also identified (albeit retrospectively) that those families whose toddlers were exposed to sun were given educational material by the local healthcare workers explaining the benefits of sunshine (28). The 25 OHD levels in South Indian subjects are relatively higher compared with the subjects from North India, from the various studies published in literature. From the same data, a strong inverse correlation between the 25 OHD levels and latitude ($r = -0.48$; $p < 0.0001$) has been established clearly proving the effectiveness of equatorial closeness (smaller zenith angle) to natural Vitamin D synthesis (26).

DIETARY CALCIUM

Even though Vitamin D surveys from rural south India (Tirupati) have similarly demonstrated higher Vitamin D levels in agricultural workers who are exposed to long hours of sunlight as part of their work (~24 ng/mL Vs 19 ng/mL) compared to urban dwellers (29), measured vitamin D levels were significantly lower than expected for the duration of sunlight exposure. Rather interestingly same group studied dietary habits in the area (30) and have demonstrated calcium deficiency in diet and evidence of high phytate consumption. Similar calcium deficient diet has been demonstrated by other groups in the country (31). The average dietary calcium intake from most studies in India of children is 430 + 180 and adults are 560 + 310 mg/day (25).

Low calcium intake increases parathyroid hormone (PTH) which increases conversion of 25(OH)D to 1,25-dihydroxyvitamin D. In addition, 1,25-dihydroxyvitamin D induces its own destruction by increasing 24-hydroxylase (32). This probably explains the low 25(OH)D concentrations in persons on a high-phytate or a low-calcium diet underlining the importance of dietary calcium for not only maintaining good bone health but in interpretation of 25(OH)D levels and subsequent therapy. Hence calcium

supplementation should be an integral part of vitamin D supplementation therapy in India.

RECOMMENDED DIETARY ALLOWANCES FOR INDIANS

Recently, the expert group of the Indian Council of Medical Research 2009, gathered to revise and update our knowledge on the human nutrient requirements and recommend the Dietary Allowances (RDA) for Indians, based on their dietary style and composition. The committee released the 2010 RDA draft document (<http://www.ninindia.org/DietaryguidelinesforIndians-Finaldraft.pdf>). The RDA (mg/day) of calcium for children 1-9 years of age is 600; children 10 – 18 years age is 800 (both genders); adults (men and women) is 600; and for pregnant and lactating women is 1200.

The committee felt that the recommendations (by international agencies) for populations living in advanced countries, where exposure to sunlight is limited, hence the need to obtain vitamin D from fortification of diet and supplementation. The committee felt that outdoor physical activity is a means of not only achieving adequate vitamin D but also controlling overweight and obesity in Indian population. The committee retained the recommendation of 400 IU (10 µg) per day.

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CHANGE IN FOOD LAWS:



PROF. JAGADISH PAI

There has been a lot of criticism of Prevention of Food Adulteration, for quite some time. There was a need for a new law to address some of the new issues as well as to harmonise with the International laws, especially, the Codex Alimentarius. There has been a tremendous increase in the international trade, and the food industry is no exception. Many food products are being imported and exported. Countries where they are marketed have their respective laws but there needs to be harmony to avoid problems in international trade. The new food law therefore needed to minimise these conflicts and also address the needs of the present day.

Consumers have started expecting much more than just the jams, jellies, ketchup, soft drinks and juices, bread and biscuits of some decades ago. Many new foods are appearing with varieties in flavours, colours and appearance to suit the individual consumers' aspirations. There is a large increase in processed foods not only to meet these expectations but also to ensure supply of ever-increasing population in cities while foods are grown in places far away from the cities. More people including women are now working and have to depend on convenience of food products that could be easily prepared and conveniently consumed.

There have been many developments in science with the discovery of many new ingredients and substances from plants that have some effects on health. Many have been observed to reduce the risk of several diseases. Although they are not medicines, their inclusion in foods needs a new set of regulations, which will ensure their safe and beneficial use in food products.

All this necessitated the Food Safety & Standards Act (FSSA) being passed by the parliament in 2006 and after five years, we now have a set of regulations called Food Safety & Standards Regulations. FSSA has replaced the older PFA along with a few more ordinances, which were also dictating food standards and regulation.

The original intention of the act was to

replace the arbitrariness in the earlier law with evidence-based safety standards and specifications, and allowing new innovative products using the new knowledge in health and nutrition. However, as the situation is seen today, the application of the act in the form of rules and regulations is yet to see the light of the day.

One of the biggest problems created by the regulatory machinery is Product Approval. Nowhere else do we have product approval but they all approve either additives or ingredients if it is a novel ingredient and whose use in food is new. Authorities must ensure safety of both additives and ingredients. If there is any safety uncertainty at higher levels, then

Our enforcement agency has started product approval for proprietary foods simply because they do not have any standards prescribed by the law.

that additive or ingredient may be given an upper limit so as to restrict its intake.

Our enforcement agency has started product approval for proprietary foods simply because they do not have any standards prescribed by the law. There are food products which have been in the market for decades, but the government is asking them to produce proof of safety. Even when one uses common ingredients which have been used in standardised foods, if it is a proprietary food item, then it must get product approval.

Even after a product is approved, if there is some minor change in one of the ingredients, then the new formulation must have fresh product approval. For example, in a beverage mix, if maltodextrin or salt quantity is reduced, then they consider it as a new product and one must seek approval. This has not only affected innovation but also posed a challenge for small business operators as each product

approval is charged at Rs 25000.

The second unique aspect of the act is, a lot of ingredients with physiological activity are being permitted. Earlier, these would go into drugs and medicine but now many Nutraceuticals and Functional Foods can be prepared and sold as foods. These are substances with the ability to reduce the risk of a disease but not able to cure the disease itself. An example would be omega-3 fatty acids like DHA and EPA which when consumed would control cholesterol. There are carotenoids including lutein and zeaxanthin which can reduce the risk of age-related Macular Degeneration (AMD) which affects eyes in old age. Probiotics are being used for many benefits including immunity and gut health.

There are many herbs and botanicals being used in products which are called health supplements. Such products are now being allowed by law but regulations are in the making. The use of these products will reduce the risks of heart disease, cancer, AMD and many more.

There are some products in the market that contain ginseng, guarana, brahmi, ashwagandha etc. which are aimed at improving vigor, memory and other faculties. The market for such products is increasing rapidly. Western markets are already worth billions of dollars and even though the Indian market is currently small, it is growing rapidly. Like the cliché goes, prevention is better than cure.

Many imported products are now being assessed for safety. These products must not only have additives and ingredients that are safe but also they must have sufficient shelf life at the time of import so they will not go beyond best before date or the expiry date during their distribution and sales in Indian markets.

Once the initial hiccups in the new law subside, then hopefully the law will enable new and better products that are safe and boast international quality. People are now aware of better nutrition and benefits of some of the nutrients and nutraceuticals. They have started buying products with omega-3, probiotics, dietary fibre etc.

Advertising for such products have also played a big role in educating consumers. However, there are also exaggerated claims to tempt consumers to buy certain products. So Authority intends to regulate claims as well.

Earlier even when one reduced a miniscule amount of sugar or salt from products a claim of 'reduced' was possible but now there are guidelines. Even for

making claims of fresh, natural etc. there are guidelines which have been drafted and soon they may become regulations. This will certainly prohibit, misleading consumers by putting claims on label which could not be supported by scientific evidence.

There are also clauses of traceability included in new regulations which will enable easy recall of unsafe foods. This is necessary for exporting to some countries

such as in European countries. There is also incorporation of safety systems such as HACCP introduced in new law so rather than rejecting the unsafe food after it is produced, the system would try to ensure that only safe foods are produced.

It is expected that the new regulations will be on par with international standards and will enable safe foods being marketed in domestic and international markets. ■

AMAZING CURES- WORMS AS OUR FRIENDS



NEELANJANA SINGH,
Nutrition Consultant, Heinz Nutri
Life Clinic

There is a saying prevalent in my part of the world, which in translation implies that a person's good fortune is not necessarily due to what may seem to be the apparent reason; in fact his well-being may be due to actions of individuals who may seem to be unconnected or even unwanted. This is certainly true of the startling and recent discovery that the hitherto undesirable hookworms that can infest human

intestines actually generate very interesting health benefits while residing in a human's intestines.

This new approach that uses parasites for health benefits should not really come as a surprise. We humans have co-existed and co-evolved with many parasites over millions of years and probably have a synergistic relationship with them. Humans became accustomed to having these bugs and worms in their bodies. These ►



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CONFUSING PARADOX IN REAL-LIFE SITUATIONS

This issue of In-Touch brings you a mix of topics with discussions on existing paradox in real-life situations. Dr Harinarayan describes the paradox of high prevalence of vitamin D deficiency in Indian population in all age groups, in spite of abundant sunlight. What we lack is the exposure and it is important that we spend at least 30 minutes under the sun. Ms Neelanjana Singh brings forth another paradox while discussing how hookworms could be our friends that help maintain immune balance. Scientists have been debating the role of infections to avoid auto-immune disorders but the most recent work is not published yet. Dr Jagdish Pai has addressed an issue of food laws, which is important, but we are mostly ignorant about it. I am sure this mix will offer readers an interesting reading with thought-provoking articles.

▶ Old friends of ours probably had a role in setting the immune regulatory system within us. Without such immune regulation, it is now being speculated that the immune system sometimes attacks very insignificant allergens or even the body itself leading to auto immune disorders. Hookworms secrete proteins that allow it to evade the actions of the human body's immune systems so that they survive in the host's intestines. The ultimate goal of hookworm therapy is to identify these proteins. These proteins could in the future be used as agents to treat a range of auto-immune disorders.

In the last century, great efforts were expended on generating medical therapies to eliminate intestinal parasites from the human system. Health researchers believe that this may be responsible for the upsurge of many immunity related illnesses such as Celiac disease, Crohn's disease, Ulcerative Colitis, asthma and hay fever. When these parasites are removed from the environment, people become self-reactive which is why there is an onset of auto-immune disorders. The aim of current research is to identify and assess the value of human hookworms in suppressing the inflammation associated with some diseases of the gut especially if there is an underlying immune disorder.

There are two diseases of the gut where hookworm therapy seems to have

made significant headway in clinical trials: Inflammatory Bowel Disease (IBD) and Celiac Disease. As stated above, in both these problems there is an uncontrolled overreaction of the immune system.

Australian researchers are keenly looking and with some success using hookworms to stimulate the immune system of the people suffering from gluten sensitivity (Celiac disease) so that they become more tolerant of the allergy causing substance.

IBD is a lifelong disorder where some part of the digestive tract becomes inflamed. Although the immune reaction is initiated by a trigger (infection/diet/environment), the immune system fails to turn off once the trigger is removed. Thus there is uncontrolled inflammation and the attack continues on the normal cells lining the intestines.

It is distressing to note that IBD is becoming more common in India, especially in the wealthier sections of society. I believe that this is directly attributable to the complete elimination of parasites such as hookworms from the guts of members of this social segment. Rising incomes, with better standards of hygiene as well as regulated food industries did not allow the protective role of worm infestation to take place.

To buttress what I have said above it will be worthwhile to look at the recent and interesting case of a 35-year-old man with

ulcerative colitis. Having to choose between surgery and immune suppression therapy, he chose to get infected with human whipworm. A dramatic improvement was seen in his condition and he remained in remission for three years. When a flare up occurred then he swallowed more worm eggs and his symptoms subsided. Studies are on to identify the parasite derived molecule that led to beneficial results.

In this context, I am reminded of a study which indicated that rats living in sewer lines had a very sturdy immune system in comparison to the others living in relatively cleaner environments. The exposure to germs (bacteria) in small doses primes the immune system and also helps it guard against these infections in the future. This works very much on the principle of how vaccines work in the human body.

My idea is by no means to propagate poor sanitary conditions. However, it may be a good idea to recognise the role of a natural environment rather than a sterile one. For this reason trying to be squeaky clean could get to be counterproductive. However, it may be a while before we could start to re-introduce worms into our guts. The concerns, risks and complications involved in hookworm therapy need to be eliminated before it can be labeled as a therapeutic procedure. The wait may be for several years! In the meantime, celebrate eating healthy food with no pesticides! ■

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