February 2019

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Cognition Prefers Early-Life Stability Yet Enjoys Variety and Challenge

In order to best your opponent, best understand him, right? Many theories of cognitive aging have been considered over the centuries, and we have learned quite a lot about the different ways humans of different ages learn. For instance, biological aging affects working memory and the speed with which we access knowledge and integrate new information (“fluid intelligence”), general knowledge is mostly maintained through life, and measures of “crystallized intelligence” like comprehension and vocabulary tend to peak at a later age. Aging can also impact how we group types of information and decide what is or isn’t relevant to the task at hand—though personal experience may also come into play. Cognitive science investigates how perception and information processing influence one another, and how lifestyle habits and behaviors affect both.

One interesting study examined measures of cognition in participants at ages 11, 79, 83, 87, 90, and 92—yes, the same surviving individuals at these different ages. While education and socioeconomic status were critical early cognitive building blocks, after filtering out effects from smoking and alcohol, activities such as social outings and reading protected cognition during middle age, and, at more advanced age, perspiration-inducing physical exertion and spending time outdoors were key to maintaining cognitive abilities. Physical activity earlier in life has also been seen to predict later cognition, emphasizing the need to keep body and mind harnessed to optimize cognitive performance. Some researchers have also suggested that hearing, vision, and capacity for sustained attention are particularly important for maintaining intellect and brain plasticity during aging.

Beyond dietary strategies for optimizing cognitive and immunometabolic aging, it appears that life-long learning experiences that involve physical activity, social
interaction, sensory stimulation, and mental and emotional challenges are the prime way to maintain dynamic cognitive health.

One-Seventh Vegetarian: Thursday is Veggie Day

For several years now, Ghent, a meat-loving city in meat-loving Belgium, has given it up for one day each week. How was a city of over half a million convinced to go one-seventh vegetarian? The main reasons were to improve health, reduce carbon emissions, and to eat in a more environmentally sustainable fashion. This venerable place of castles, cathedrals, and Flemish Masters has even taught children about these different costs of meat, realizing that behavior modification at the community level is an excellent way to secure their economic future.

Semi-vegetarian eating is a way of garnering many of the benefits of a vegetarian diet without being wholly vegetarian, and while not rigidly defined, may constitute restricted consumption of flesh foods, of red meat, or of all animal foods either at all times, at certain meals, or on certain days. Though this eating plan and studies on it are both relatively new, emerging research suggests weight and metabolic benefits intermediate between those of vegan and ovo-lacto vegetarian patterns, with preliminary indications that it may also be helpful in inflammatory bowel disease. A European nutritional analysis of vegan, vegetarian, and omnivorous diets found that vegan eating patterns scored highest according to both 2010 Healthy Eating Index and Mediterranean Diet criteria, and that:

- Omnivorous eating patterns provided the highest sodium, energy, cholesterol, alcohol, fat, and saturated fat levels and the least fiber and polyunsaturated fats, and this group showed the highest prevalence of overweight and obesity
- Vegan eating patterns provided the least sodium, energy, cholesterol, alcohol, fat, and saturated fat and the most fiber and polyunsaturated fats, but tended to be low in calcium (while surprisingly adequate in vitamin B12, probably due to European food fortification with this nutrient)
- Vegetarian, semi-vegetarian, and fish-vegetarian eating patterns showed nutritional characteristics intermediate between vegan and omnivorous patterns, but were generally found to be nutritionally adequate and balanced

While the semi-vegetarian eating approach appears to be more readily adopted by women than by men, it provides a wide degree of freedom to select foods according to preference, with the understanding that the more one leans towards vegetarianism, the greater the accrued environmental and metabolic benefits. A 2012 JAMA-published analysis found that daily consumption of just one serving of red meat (either processed or unprocessed) increased overall mortality as well as risks for cancer and cardiovascular disease. This study concluded that replacing one serving of red meat daily with another protein source (like nuts, beans, grains, fish, dairy, or poultry) could reduce overall mortality by up to 19 percent and that restricting red meat intake to an average of less than half of a serving daily could reduce premature deaths by 10 percent. Thus, even on a semi-vegetarian eating plan, one can still enjoy steak or corned beef on occasion.

Metabolomic research increasingly distinguishes among the metabolic end-products of those with different eating patterns, particularly in levels of fat and protein metabolites such as glycerophospholipids (lipoprotein precursors), sphingolipids (which influence cell membrane dynamics), creatinine, and amines. Some research suggests that variations in amino acid metabolites produced by different eating patterns may mediate their effects and explain some of the cardiometabolic benefits associated with plant-based diets. Genetic research, including genome-wide association surveys, is discovering gene variants associated with metabolism of meat (especially red meat) that may predispose individuals to greater health risk for cardiovascular illness, lung cancer, and digestive cancers at higher intakes. These findings, especially combined with personalized health and lifestyle evaluation, may help guide consumers in deciding if and to what degree
they may wish to restrict meat intakes. Though meat-eating remains a personal choice, the tools of precision medicine enable better estimation of the risks and benefits it presents.

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**SNiPpets**

How significant to health are particular single nucleotide polymorphisms, also known as SNPs? SNiPpets is a ongoing exploration of this topic. This column is produced by Jeffrey Bland, PhD and the Personalized Lifestyle Medicine Institute.

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**This SNP May Boost Immunologic Effects of Processed Meat**

Habitual meat intake, especially of red or processed meat and with lower consumption of plant foods, influences risk for certain cancers, but genetic variations can further tip the scales. The GATA3 gene codes for binding proteins that influence how T-helper immune cells mature and specialize, and the expression of this gene is known to modulate risks for breast, lung, prostate, and colorectal cancers as well as ulcerative colitis. Recent research has uncovered discovered minor variants at GATA3 that, in conjunction with particular dietary patterns, can substantially increase some of these.

A genome-wide association survey (GWAS) found that, compared to individuals with the major GG genotype at the rs4143094 locus near this gene, despite eating comparable amounts of processed meats, those with a TT genotype (a double SNP) show a 39 percent increased risk for colorectal cancer while a TG genotype (single SNP) confers a 20 percent greater risk. This study also found that those eating more processed meats ate less in the way of vegetables, fruits, and plant fiber. For these reasons, individuals with SNPs in the region of the crucial immune-related GATA3 gene may wish to reduce their meat consumption and discuss plant-based dietary approaches with a Functional Medicine practitioner.

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**2018 Thought Leaders Consortium Videos are Now Online!**

Great Minds Share the Stage

Registration for our Seventh Annual Thought Leaders Consortium in Seattle, WA is **NOW OPEN**. The dates are October 11-12, 2019. We hope you will join us because we're planning another amazing conference this year. To better understand the scope, scholarship, and clinical relevance of PLMI’s annual TLC program, please view and enjoy this clip from one of last year's most popular panel discussions.

We are very excited to announce that the video collection from our 2018 event is now available to stream online in PLMI's free education portal. In Arizona, we
brought together experts from the fields of aging research, Big Data analysis, and lifestyle medicine. When you explore our growing archive of video presentations, you'll find dynamic presenters, powerful information, and Dr. Jeff Bland's unique style of synthesis at the touch of your fingertips. Would you like to view additional preview clips? Click HERE for more highlights.