

Filling nutrient gaps in specialty diets

April 28 2016, by Linda Milo Ohr



Paleo, high-protein, low-carbohydrate, gluten-free, vegetarian, and vegan. These eating lifestyles can all be found within today's diverse consumer landscape. Whether people adopt these dietary approaches in order to lose weight or maintain overall wellness, there are often nutrients that these consumers need to ensure nutritious diets. Here is a look at the various diet patterns and some nutrients—including iron, protein, calcium, omega-3 fatty acids, and vitamins—that are important to them.

Vegetarian and Vegan

Global vegetarian and vegan product launches have surged, with a 21% increase in 2014 over 2013, according to Innova Market Insights, Arnhem, the Netherlands (innovadatabase.com). Vegetarian-oriented [consumers](#) form a significant and growing part of the consumer base worldwide, comprising as much as 20% of the global population (DSM 2013). Worldwide, there are around 1.4 billion vegetarians, and the number is increasing.

The 2015–2020 Dietary Guidelines for Americans lists a Healthy Vegetarian Eating Pattern as an example of a healthy eating pattern that individuals may choose based on personal preference. The report says this about vegetarian diets. "In comparison to the Healthy U.S.-Style Eating Pattern, the Healthy Vegetarian Eating Pattern includes more legumes (beans and peas), soy products, nuts and seeds, and whole grains. It contains no meats, poultry, or seafood, and is identical to the Healthy U.S.-Style Eating Pattern in amounts of all other food groups. The Pattern is similar in meeting nutrient standards to the Healthy U.S.-Style Pattern, but is somewhat higher in [calcium](#) and dietary fiber and lower in vitamin D, due to differences in the foods included in the protein foods group, specifically more tofu and beans and no seafood," (HHS/USDA 2016).

Mayo Clinic recommends that vegetarians pay special attention to consuming calcium, vitamin D, vitamin B12, protein, [omega-3 fatty acids](#), iron, and zinc. Vitamin B12 is necessary to produce red blood cells while iron is also a component of red blood cells and is important for oxygen transport. It also plays a role in energy metabolism and the immune system. For iron fortification of vegetarian products, Frutarom Health, Wädenswil, Switzerland (frutaromhealth.com), offers AB-Fortis, a patented encapsulated iron system. AB-Fortis is produced by a patented process to provide stable encapsulation with minimal release of

free iron into the food matrix. The spherical gelation of ferric saccharate by calcium alginate results in an encapsulated iron salt with a high (40%) iron content.

Omega-3 fatty acids are important for heart health and cognition. They are mainly found in fish, however vegetarian-sourced omega-3s are available. For example, DSM Nutritional Products, Parsippany, N.J. (dsm.com), offers algae-based omega-3 fatty acid ingredients. The line includes life'sDHA (omega-3 docosahexaenoic acid) and life'sOMEGA (omega-3 LC eicosapentaenoic acid + docosahexaenoic acid).

At this year's Natural Products Expo West show, alternative protein sources were abundant. Not only do these ingredients cater to vegetarians looking to consume adequate amounts of protein, they also address sustainability concerns. Pea proteins, soy proteins, chickpea proteins, and more were found in everything from pasta and vegetarian burgers to chips and granolas. For example, World Food Processing, Oskaloosa, Iowa (worldfoodprocessing.com), showcased PURISPea 870 pea protein in a classic chickpea hummus as well as in a pulse hummus made with PURISWhole Red Lentil Powder. PURISPea was also featured in a vegan protein shake.

High-Protein/Low-Carb/Gluten-Free

High-protein/low-carbohydrate diets, carbohydrate-free diets, and gluten-free diets put a major emphasis on eliminating or reducing carbohydrate consumption and often whole grains from the diet. Gluten-free diets are essential for those diagnosed with celiac disease, but the gluten-free lifestyle has a growing following among those who feel they are sensitive to gluten, think gluten is bad for them, or want to reduce carbohydrates in their diets.

Research from market research firm Mintel, Chicago, Ill. (mintel.com),

reveals that 25% of consumers report that they consume gluten-free foods, a 67% increase from 2013. Mintel's Gluten-free Foods U.S. 2015 report found that the gluten-free food category has experienced growth of 136% from 2013 to 2015, reaching estimated sales of \$11.6 billion in 2015. With more than one quarter (27%) of gluten-free food consumers looking for gluten-free labels on food packaging, gluten-free food sales exploded to 6.5% of total food sales in 2015 from 2.8% in 2013.

"Low-carbohydrate diets have been around for a long time," says Jim White, spokesperson for the Academy of Nutrition and Dietetics (eatright.org) and owner of Jim White Fitness & Nutrition Studios, Virginia Beach, Va. (jimwhitefit.com). "With low carbs, you are missing one of the major macronutrients, whole grains. You can end up missing out on B vitamins for energy metabolism and dietary fiber, which already as a nation we are not consuming enough of." White explains that if not enough fiber is consumed, the unique nutritional benefits aren't felt, such as satiety, transit time, and cholesterol reduction. "Initially, when you decrease carbohydrates, there will be weight loss, but most will be water weight because there are about 3 grams of water per 1 gram of carbohydrate." White notes that consumers following a gluten-free diet do have other sources of complex carbohydrates available to them, including quinoa, brown rice, and sweet potatoes.

Ingredient suppliers and food manufacturers offer several options for gluten-free and low-carb flours. At the Natural Products Expo West show, Pereg Natural Foods, N.Y. (pereg-gourmet.com), debuted a line of gluten-free flours for retail purchase, including almond flour, banana flour, buckwheat flour, chickpea flour, and coconut flour.

With 2016 being declared the International Year of Pulses by the 68th United Nations General Assembly, pulse flours and pulse proteins will continue to grow in popularity for gluten-free and vegetarian lifestyles. Not only are pulses gluten-free and plant-based, they are also nutritional

powerhouses of protein, fiber, resistant starch, vitamins, and minerals.

Ingredion, Westchester, Ill. (ingredion.com), works with AGT Food and Ingredients, Regina, Saskatchewan, Canada (agtfoods.com), to offer the HOMECRAFT line of pulse-based flours, including pea, lentil, chickpea, and faba bean varieties. The flours contain high-quality protein—about twice as much protein as cereal grains—and are high in soluble and insoluble dietary fiber and resistant starch. At the Natural Products Expo West show, HOMECRAFT Pulse faba bean flour was featured in an ancient grain jerky bar along with the company's VITESSENCE Pulse faba bean protein.

Paleo

The Paleo diet, often referred to as the Caveman diet, advises consumers to return to the eating habits of our ancestors. The basic diet consists of lean meat, fish/seafood, nuts, fruits, vegetables, and healthful oils (olive, walnut, flaxseed, macadamia, avocado, and coconut). What is cut out of the diet are grains, legumes, dairy products, and foods high in refined sugar and salt, processed foods, potatoes, and refined vegetable oils.

The Paleo (short for Paleolithic) lifestyle is growing. According to Innova Market Insights, a surge has been seen over the past five years when looking at the use of the word "paleo" in launch activity, from single figures in 2010 to more than 300 in the 12 months to the end of September 2015. Although this remains very small in terms of global launch activity totals, it is nearly three times the number recorded in the previous 12-month period.

The Paleo diet is popular for weight loss as well as athletic performance because of its focus on lean protein consumption. Manheimer et al. (2015) demonstrated that the Paleo diet resulted in greater short-term improvements on metabolic syndrome components than did guideline-

based control diets. The researchers conducted a systematic review of randomized controlled trials (RCTs) that compared the Paleo nutritional pattern with any other dietary pattern in participants with one or more of the five components of metabolic syndrome. Four RCTs that involved 159 participants were included. The four control diets were based on distinct national nutrition guidelines but were broadly similar. Paleo nutrition resulted in greater short-term improvements than did the control diets for waist circumference, triglycerides, systolic blood pressure, diastolic blood pressure, HDL cholesterol, and fasting blood sugar.

With its focus on lean proteins and elimination of grains and dairy, those following the Paleo lifestyle need to consider [nutrients](#) they may not be getting adequate amounts of. It is recommended that people should supplement with folate, B vitamins, calcium, and vitamin D. "With many diets, especially Paleo and dairy-free, we are seeing people not getting enough calcium and vitamin D," observes White.

Products marketed as Paleo-friendly include novel ingredients in their formulations. For example, Paleo Thin Crackers from Julian Bakery, Oceanside, Calif. (julianbakery.com), are made of blanched almond flour, cassava flour, flax, and spices. The company also sells various Paleo Breads that contain almond flour and/or coconut flour.

With the elimination of cereal grains, the door is open to manufacturers to find novel, Paleo-approved sources of flour. In more and more Paleo snacks, you will find blanched almond flour on ingredient statements. Other approved flours include tapioca flour and coconut flour. Blue Diamond Almonds, Global Ingredients Division, Sacramento, Calif. (www.bdingredients.com), introduced a line of almond flours last year, including Extra Fine Natural, Extra Fine Blanched, and Fine Blanched. Each 1/4-cup serving contains 6 g of [protein](#), 3.5 g of fiber, and 75 mg of calcium. Almond flour is also high in monounsaturated fat and a great

food source of vitamin E. Not only can almond flour be used in bakery applications, it can also help crackers stay crispy longer and be used as coatings for fish and chicken.

It is important to note that with any diet or eating lifestyle, White recommends looking for long-term solutions, sustainability, and adherence. "As registered dietitians, motivational interviewing is very important," he says. "As a dietitian, we don't want to tell people what they should do. We honor their beliefs, social values, budgets, and goals. We take that and design a fair, nutritious meal plan or behavior modification that is more realistic and will keep weight off in the long run."

Provided by Institute of Food Technologists

Citation: Filling nutrient gaps in specialty diets (2016, April 28) retrieved 3 May 2024 from <https://medicalxpress.com/news/2016-04-nutrient-gaps-specialty-diets.html>

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