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# Vegetarian Nutrition

## VN: Introduction (2011)

Guideline Overview

Guideline Title

Vegetarian Nutrition (2011) Evidence-based Practice Guideline

Guideline Narrative Overview

The focus of this guideline is on Medical Nutrition Therapy (MNT) for individuals who follow or are interested in following a vegetarian dietary pattern. Thus, the guideline is not limited to individuals who currently follow this dietary pattern.

Vegetarian dietary patterns are anything but uniform or static. This guideline aims to identify a range of factors involved in vegetarian dietary patterns. A major point of consensus among the articles analyzed is that within vegetarian diets, there are wide variations in foods eaten and complexity regarding dietary practices, beliefs and motivations. Vegetarian dietary practices vary by culture, food availability, region, age and motivation. Additionally, vegetarian diets change over time as vegetarians may become either more restrictive or lenient. All of these factors may be critically important for the health care professional serving vegetarian clients or patients. The emphasis of this guideline is on patient or client *choice* rather than on advocating any one particular dietary pattern. The goal is to provide resources derived from a systematic review of research, for Registered Dietitians (RD) to enable their clients to make healthful vegetarian dietary choices.

### Treating Disease

A wealth of research highlights the importance of diet in the treatment and management of a range of diseases or conditions. A well-designed diet based primarily on a variety of plant foods (see definitions below) may be used therapeutically as an alternative to an omnivorous diet in the treatment or management of these diseases or conditions. Individuals who are vegetarian, as well as those who are not but who are interested in exploring different plant-based/vegetarian dietary options to improve their medical conditions may benefit from the contents of this guideline.

### Promoting Health

Treating disease is only one reason for following a vegetarian dietary pattern. Individuals often seek to follow a vegetarian diet in order to become or stay healthy. Thus, the goal may be to maintain health by preventing, rather than treating disease. However, simply avoiding meat or animal products is not a guarantee of a healthful diet. Just as there is no single healthful "omnivorous diet," there is no single healthful "vegetarian diet." Rather, "vegetarian" is a general label given to a wide range of dietary patterns that share an avoidance of animal or animal-derived foods. It must be assumed that individuals who describe themselves as vegetarian may not automatically eat in a healthful manner and so may also benefit from this guideline. This guideline is designed to provide evidence-based findings to aid in the design of healthful flesh-free and animal-free diets that meet the nutritional needs of a broad range of individuals.

### Facilitating Lifestyle Choices

Further research demonstrates that there are varied and complex reasons individuals follow a vegetarian dietary pattern. For many people, avoiding animal-derived foods is not merely a dietary choice, but rather one part of their larger worldview and lifestyle choice. In addition to health and disease treatment, some motivations for choosing to follow a vegetarian diet include economics, religious beliefs, environmental concerns and support for animal rights. Thus, this guideline seeks to enable the RD to help individuals identify dietary choices that not only support their client's moral, ethical or religious views, but promote optimal health as well.

### Adapting to Changing Needs

Finally, dietary needs are not static throughout the life cycle and interest in and commitment to vegetarian dietary patterns may change throughout life. Therefore, this guideline encourages the RD to maintain flexibility and acceptance to support the lifestyle choices and dynamic intake of individuals in this population. To assist the RD, this resource provides guidance on identifying specific reasons for following a vegetarian diet as well as recognizing the needs of vegetarians, particularly within specific target groups (children, adolescents and pregnant women). This resource also encourages planning appropriate nutrition interventions and formulating a personalized plan to improve or maintain health.

### Definitions

**Vegetarian:** A dietary pattern that is exclusively or almost exclusively composed of plant foods. Some vegetarians may consume specified animal products, such as eggs, milk and milk products (lacto-ovo vegetarian), and processed foods containing small amounts of animal products (whey, casein). The two most common ways of defining vegetarian diets in research and the general population are:

*Vegan diet:* Diets free from all flesh foods, eggs and dairy products; May also include avoidance of honey.

*Vegetarian diet:* Diets free of all flesh foods, but may include egg (ovo) and dairy (lacto) products.

**Ovo-vegetarian:** A vegetarian dietary pattern free from all flesh and dairy foods but includes eggs.

**Lacto-vegetarian:** A vegetarian dietary pattern free from all flesh foods and eggs but includes dairy products.

**Lacto-ovo vegetarian:** A vegetarian dietary pattern free from all flesh foods but includes eggs and dairy products.

**Fruitarianism:** A type of vegan diet that includes consumption of fruits, nuts and seeds, but no vegetables or grains, as well as no animal products.

**Vegan:** A dietary pattern free from all flesh foods, eggs and dairy products; May also include avoidance of honey.

**Semi-vegetarian:** A plant-based dietary pattern that includes occasional meat products, but seeks to limit the type and/or amount of meat. A semi-vegetarian may seek to reduce beef and pork to once or twice a week or limit their meat intake entirely to poultry and/or fish. This dietary pattern may also be referred to as a "demi-" or "quasi-vegetarian" diet and sometimes as a flexitarian diet.

**Pesco-vegetarian:** While not a vegetarian dietary pattern, this self-defined term used by some to define a semi-vegetarian plant-based eating pattern is free from red meat (beef, pork, lamb, etc.) and poultry, but includes fish and other seafood, and may include eggs and dairy products. May also be called pescetarian.

**Macrobiotic:** A macrobiotic diet (or macrobiotic) is a strict whole-foods vegetarian or pesco-vegetarian (a diet that includes fish, but no meat or poultry) diet. The foundation of a typical macrobiotic dietary regimen includes brown rice and whole grains (50% to 60%), supplemented with other foodstuffs such as local vegetables and seaweed (25% to 30%), beans and bean soups (5% to 10%), fish, nuts, seeds, certain fruits and miso soup (5% to 20%).

Macrobiotic principles also govern food preparation and the manner in which food is eaten. For example, the principles recommend avoiding use of the microwave, chewing food completely, eating in an orderly and relaxed manner using good posture, and avoiding overeating.

**Omnivore:** A dietary pattern that includes both plant and animal products, including flesh foods.

## Guideline Development

The recommendations in the guideline were based on a systematic review of the literature. It should be noted here that the research reviewed revealed ambiguity in definitions of vegetarian diets that are prevalent in the general population at large.

Topics include:

- Types and Diversity of Vegetarian Diets
- Vegetarian Nutrition and Nutrients
  - Vegetarian Nutrition and Vitamin B-12
  - Vegetarian Nutrition and Lipids
- Vegetarian Nutrition in the Lifecycle
  - Vegetarian Nutrition in Adolescence
  - Vegetarian Nutrition in Pregnancy
- Vegetarian Nutrition and Chronic Diseases
  - Vegetarian Nutrition and Cardiovascular Disease
  - Vegetarian Nutrition and Obesity
  - Vegetarian Nutrition and Type 2 Diabetes
  - Therapeutic Diets and Attrition

The recommendations are based on the work performed by the project team. The number of supporting documents for these topics is below:

- Recommendations: Seventeen (17)
- Conclusion Statements: Thirty-nine (39)
- Evidence Summaries: Twenty-one (21)
- Article Worksheets: Ninety-five (95)

## Application of the Guideline

This guideline will be accompanied by a set of companion documents (i.e., a toolkit) to assist the practitioner in applying the guideline. The toolkit will contain materials such as the MNT protocol, documentation forms, outcomes management tools, client education resources and case studies. It is currently under development and will undergo pilot testing through the ADA's Dietetic Practice-Based Research Network prior to publication.

## Revision

The literature search will be repeated for each guideline topic on an annual basis to identify new research that has been published since the previous search was completed. Based on the quantity and quality of new research, a determination will be made about whether the new information could change the published recommendation or rating.

If a revision is unwarranted, then the search is recorded, dated and saved until the next review and no further action is taken. If it is determined that there could be a change in the recommendation or rating, then the supporting evidence analysis question(s) will be re-analyzed following the standard ADA Evidence Analysis Process (see ADA Evidence Analysis Manual).

When the analysis is completed, the expert workgroup will approve and re-grade the conclusion statements and recommendations. The guideline will undergo a complete revision every three to five years.

## Medical Nutrition Therapy and Vegetarian Nutrition

The RD plays an integral role on the interdisciplinary care team by determining the optimal nutrition prescription and developing the nutrition care plan for vegetarian individuals. An RD knowledgeable or experienced in vegetarian diet counseling is preferred.

As part of the nutrition care process, the RD applies knowledge, skills and training to first conduct a comprehensive nutrition assessment in order to determine an accurate nutrition diagnosis(es) for the patient or client.

The RD then considers the patient's or client's lifestyle preferences and other health conditions to develop the nutrition prescription, according to the Vegetarian Nutrition Guideline. The RD may also consult other relevant, evidence-based nutrition practice guidelines, such as adult weight management, disorders of lipid metabolism, hypertension and Type 2 diabetes or other guidelines that will further influence the optimal treatment. The RD skillfully blends the macronutrient and micronutrient mix to achieve the appropriate diet prescription without compromising individual health needs and therapeutic goals.

During MNT intervention, the RD and the patient or client plan the course of action and the RD educates or counsels the patient

or client on the appropriate diet, behavior and lifestyle changes in a manner and sequence that best meet the patient's or client's needs. Use of motivational interviewing or other proven strategies can further enhance adherence. Following the initial intervention, the RD monitors and evaluates progress over subsequent visits to determine whether the goals are being met and provides ongoing support and adjusts the nutrition prescription as needed.

### Populations to Whom This Guideline May Apply

This guideline applies to people who follow or are interested in following a [vegetarian dietary pattern](#).

### Other Guideline Overview Material

For more details on the guideline components, click an item below:

- Scope of Guideline
- Statement of Intent
- Guideline Methods
- Implementation of the Guideline
- Benefits and Harms of Implementing the Recommendations [↪](#)

### Contraindications

Clinical judgment is crucial in the application of these guidelines. Careful consideration should be given to the application of these guidelines for patients with significant medical problems.

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# Vegetarian Nutrition

## VN: Scope of Guideline (2011)

Below, you will find a list of characteristics that describe the **Scope** of this Guideline.

### Guideline Category

Assessment of Therapeutic Effectiveness, Counseling, Evaluation, Management, Treatment

### Clinical Specialty

Cardiology, Endocrinology, Family Practice, Internal Medicine, Nutrition, Obstetrics and Gynecology, Pediatrics

### Intended Users

Registered Dietitians, Advanced Practice Nurses, Health Care Providers, Nurses, Nurse Midwives, Physician Assistants, Physicians, Students

### Guideline Objective(s)

#### Overall Objective

To provide [MNT](#) guidelines for individuals who follow or are interested in following a [vegetarian](#) dietary lifestyle.

#### Specific Objectives

- To define evidence-based vegetarian nutrition recommendations for [RDs](#) that are carried out in collaboration with other healthcare providers
- To guide practice decisions that integrate medical, nutritional and behavioral strategies into the overall medical management of people choosing or interested in a [vegetarian dietary pattern](#)
- To reduce variations in practice among RDs
- To provide RDs with data and insight to make recommendations to adjust MNT or recommend other therapies and strategies to achieve desired outcomes for treatment or prevention of disease
- To enable RDs to help individuals identify dietary choices that not only support their clients' moral, ethical or religious views, but promote optimal health as well
- To provide evidence-based findings to aid RDs in the design of healthy flesh-free and animal-free diets that meet the needs and interests of a broad range of individuals
- To provide resources, derived from a [systematic review](#) of research, for RDs to enable their clients to make healthful vegetarian dietary choices
- To promote self-management strategies that empower the patient to take responsibility for day-to-day management and provide RDs with data to make recommendations to adjust MNT or to recommend other therapies to achieve clinical outcomes
- To enhance the quality of life for individual vegetarians, utilizing customized strategies based on the individual's preferences, lifestyle and goals
- To develop content for interventions that can be tested on clinical outcomes
- To define the highest quality of care within cost constraints of the current healthcare environment.

### Target Population

Pre-school Child (2 to 5 years), Child (6 to 12 years), Adolescent (13 to 18 years), Adult (19 to 44 years), Middle Age (45 to 64 years), Aged (65 to 79 years), Advanced Aged (80 years and over), Male, Female

### Target Population Description

Children, adolescents and adults who follow or are interested in following a vegetarian dietary lifestyle.

## Interventions and Practices Considered

This guideline is based on ADA's Nutrition Care Process and Model, which involves the following steps:

- Nutrition Assessment
- Nutrition Diagnosis
- Nutrition Intervention
- Nutrition Monitoring and Evaluation.

This guideline addresses topics that correspond to the following areas of the Nutrition Care Process. Please refer to the Algorithms in this guideline for a more detailed view of the recommendations and their application within the Nutrition Care Process.

- I. Referral to an RD
- II. MNT.

### A. Nutrition Assessment

Below you will find the nutrition assessment terms related to effective MNT in the vegetarian nutrition from International Dietetics & Nutrition Terminology Reference Manual. Standardized Language for the Nutrition Care Process. Third Edition.

1. Client history
  - Medical/health history
  - Medication and supplement history
  - Social history
  - Personal history.
2. Biochemical data—relevant laboratory values
3. Anthropometric measurements
  - Height, weight and BMI, waist circumference
  - Weight change rate.
4. Food/nutrition history
  - Food intake
  - Nutrition and health awareness
  - Physical activity and exercise
  - Food availability
  - Psychosocial and economic issues impacting nutrition therapy
  - Consideration of co-morbid conditions and need for additional modifications in nutrition care plan.
5. Physical examination findings

### B. Nutrition Diagnosis

Below you will find the nutrition diagnoses related to effective MNT in the vegetarian nutrition from International Dietetics & Nutrition Terminology Reference Manual. Standardized Language for the Nutrition Care Process. Third Edition.

### C. Nutrition Intervention (Planning and Implementation)

Below you will find the nutrition interventions related to effective MNT in the vegetarian nutrition from *International Dietetics & Nutrition Terminology Reference Manual. Standardized Language for the Nutrition Care Process.* Third Edition.

Individualized prescription based on:

1. Food/Nutrition Intervention
2. Physical activity Interventions
3. Behavioral Interventions
4. Pharmacotherapy, when indicated.

### D. Monitoring and Evaluation

The monitoring or progress, measuring of outcomes, and evaluating of outcomes against criteria to determine changes in specific indicators of MNT outcomes.

Below you will find the nutrition monitoring and evaluation terms related to effective MNT in the vegetarian nutrition from *International Dietetics & Nutrition Terminology Reference Manual. Standardized Language for the Nutrition Care Process.* Third Edition.

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# Vegetarian Nutrition

## VN: Statement of Intent (2011)

### Statement of Intent

Evidence-based nutrition practice guidelines are developed to help dietetic practitioners, patients and consumers make shared decisions about health care choices in specific clinical circumstances. If properly developed, communicated and implemented, guidelines can improve care.

While they represent a statement of best practice based on the latest available evidence at the time of publishing, they are not intended to overrule professional judgment. Rather, they may be viewed as a relative constraint on individual clinician discretion in a particular clinical circumstance. The independent skill and judgment of the health care provider must always dictate treatment decisions. These nutrition practice guidelines are provided with the express understanding that they do not establish or specify particular standards of care, whether legal, medical or other.

### The Role of Patient Preference

This guideline recognizes the role of patient preferences for possible outcomes of care, when the appropriateness of a clinical intervention involves a substantial element of personal choice or values. With regard to types of evidence that are associated with particular outcomes, Shaughnessy and Slawson (1-3) describe two major classes. Patient-oriented evidence that matters (POEM) deals with outcomes of importance to patients, such as changes in morbidity, mortality or quality of life. Disease-oriented evidence (DOE) deals with surrogate end-points, such as changes in laboratory values or other measures of response. Although the results of DOE sometimes parallel the results of POEM, they do not always correspond.

When possible, ADA recommends using POEM-type evidence rather than DOE. When DOE is the only guidance available, the guideline indicates that key clinical recommendations lack the support of outcomes evidence.

### References

1. Slawson DC, Shaughnessy AF. Becoming an information master: using POEMs to change practice with confidence. Patient-Oriented Evidence that Matters. *J Fam Pract.* 2000 Jan; 49 (1): 63-67. Erratum in: *J Fam Pract.* 2000 Mar; 49 (3): 276.
2. Slawson DC, Shaughnessy AF, Ebell MH, Barry HC. Mastering medical information and the role of POEMs--Patient-Oriented Evidence that Matters. *J Fam Pract.* 1997 Sep; 45 (3): 195-196.
3. Shaughnessy AF, Slawson DC. POEMs: patient-oriented evidence that matters. *Ann Intern Med.* 1997 Apr 15; 126 (8): 667.

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## Vegetarian Nutrition

### VN: Guideline Methods (2011)

#### General and Specific Methods for Vegetarian Nutrition Guideline

Below are links to both the general methods that ADA has put in place for evidence analysis and creating the guidelines, as well as the specific search methods and criteria for each question.

#### General Methods

[Click here](#) to view a description of the ADA's process of evidence analysis and guideline creation.

#### Methods for Specific Topics

To view descriptions of search criteria and findings for each topic covered in this guideline, select Specific Methods from the Introduction section.

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### VN: Specific Methods (2011)

#### Search Criteria and Results for Specific Topics

Each evidence analysis topic has a link to supporting evidence, where the **Search Plan and Results** can be found. Here, you can view when the search plan was performed, inclusion and exclusion criteria, search terms, databases that were searched and the excluded articles. Below are a list of the recommendations and the related evidence analysis questions, with the link to each search plan. Some recommendations are supported by multiple conclusion statements and therefore have multiple search plans listed.

Vegetarian Nutrition (VN) Evidence-Based Nutrition Practice Guideline

#### Assessment

VN: Assessing Food and Nutrient intake of Child and Adolescent Vegetarians

[Search Plan and Results: Vegetarianism and Vitamin B12 Status - 2010](#)

[Search Plan and Results: Vegetarianism and Adolescence - 2008](#)

VN: Assessing Knowledge, Beliefs and Motivations of Adult, Child and Adolescent Vegetarians

[Search Plan and Results: Types of Vegetarian Diets - 2008](#)

[Search Plan and Results: Vegetarianism and Adolescence - 2008](#)

VN: Assessing for Signs of Eating Disorder Behaviors of Adolescent and Young Adult Vegetarians

[Search Plan and Results: Vegetarianism and Adolescence - 2008](#)

VN: Assessing Biochemical Data of Adult, Child and Adolescent Vegetarians

[Search Plan and Results: Vegetarianism and Vitamin B12 Status - 2010](#)

[Search Plan and Results: Vegetarianism and Adolescence - 2008](#)

VN: Assessing Food and Nutrient intake of Adult Vegetarians

[Search Plan and Results: Vegetarianism and Vitamin B12 Status - 2010](#)

VN: Assessing Food and Nutrient Intake of Adolescent and Adult Vegetarians During Pregnancy

[Search Plan and Results: Vegetarianism and Vitamin B12 Status - 2010](#)

[Search Plan and Results: Vegetarian Micronutrient Intake During Pregnancy - 2006](#)

[Search Plan and Results: Vegetarian Nutrition and Macronutrients During Pregnancy - 2006](#)

## **Intervention**

VN: Dietary and Micronutrient Intake of Child and Adolescent Vegetarians

[Search Plan and Results: Vegetarianism and Adolescence - 2008](#)

[Search Plan and Results: Vegetarianism and Vitamin B12 Status - 2010](#)

VN: Diet Diversity for Adult, Child and Adolescent Vegetarian Diets

[Search Plan and Results: Types of Vegetarian Diets - 2008](#)

[Search Plan and Results: Types of Vegetarian Diets - 2008](#)

VN: Macronutrient Intake of Adult, Child and Adolescent Vegetarians

None.

VN: Micronutrient Intake of Adult Vegetarians

[Search Plan and Results: Vegetarianism and Vitamin B12 Status - 2010](#)

VN: Nutrition Counseling to Support a Therapeutic Vegetarian Diet for Adults

[Search Plan and Results: Vegetarian Nutrition and Type 2 Diabetes - 2008](#)

[Search Plan and Results: Vegetarian Nutrition and Cholesterol Intervention - 2008](#)

[Search Plan and Results: Vegetarian Nutrition and Obesity/Overweight Treatment - 2008](#)

[Search Plan and Results: Vegetarian Nutrition and Triglycerides \(Intervention Studies\) - 2008](#)

[Search Plan and Results: Strategies - 2007](#)

[Search Plan and Results: Counseling Theories - 2007](#)

VN: Macronutrient Intake in Adolescent and Adult Vegetarians During Pregnancy

[Search Plan and Results: Vegetarian Nutrition and Macronutrients During Pregnancy - 2006](#)

VN: Micronutrient Intake in Adolescent and Adult Vegetarians During Pregnancy

[Search Plan and Results: Vegetarian Micronutrient Intake During Pregnancy - 2006](#)

## *Treating Diseases with a Vegetarian Diet*

VN: Hyperlipidemia Treatment with a Vegetarian Diet for Adults

[Search Plan and Results: Vegetarian Nutrition and Cholesterol Intervention - 2008](#)

VN: Overweight/Obesity Treatment with a Vegetarian Diet for Adults

[Search Plan and Results: Vegetarian Nutrition and Obesity/Overweight Treatment - 2008](#)

VN: Type 2 Diabetes Treatment with a Vegetarian Diet for Adults

[Search Plan and Results: Vegetarian Nutrition and Type 2 Diabetes - 2008](#)

## Monitoring and Evaluation

VN: Monitoring Adherence to Vegetarian Diet Prescriptions for Adults

[Search Plan and Results: Vegetarian Nutrition and Type 2 Diabetes - 2008](#)

[Search Plan and Results: Vegetarian Nutrition and Cholesterol Intervention - 2008](#)

[Search Plan and Results: Vegetarian Nutrition and Obesity/Overweight Treatment - 2008](#)

[Search Plan and Results: Vegetarian Nutrition and Triglycerides \(Intervention Studies\) - 2008](#)

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# Vegetarian Nutrition

## VN: Implementation of the Guideline (2011)

Implementation of the Guideline

This publication of this guideline is an integral part of the plans for getting the ADA MNT evidence-based recommendations for vegetarian nutrition to all dietetics practitioners engaged in, teaching about or researching the topic. National implementation workshops at various sites around the country and during the ADA Food Nutrition Conference Expo (FNCE) are planned. Additionally, there are recommended dissemination and adoption strategies for local use.

The guideline development team recommended multi-faceted strategies to disseminate the guideline and encourage its implementation. Management support and learning through social influence are likely to be effective in implementing guidelines in dietetic practice. However, additional interventions may be needed to achieve real change in practice routines.

Implementation of the guideline will be achieved by announcement at professional events, presentations and training. Some strategies include:

- **National and Local Events** – State dietetic association meetings and media coverage will help launch the guideline
- **Local Feedback Adaptation** – Presentation by members of the work group at peer review meetings and opportunities for CEUs for courses completed
- **Education Initiatives** – The guideline and supplementary resources will be freely available for use in the education and training of dietetic interns and students in approved Commission on Accreditation of Dietetics Education (CADE) programs
- **Champions** – Local champions will be identified and expert members of the guideline team will prepare articles for publications. Resources will be provided that include PowerPoint presentations, full guidelines and pre-prepared case studies.
- **Practical Tools** – Some of the tools that will be developed to help implement the guideline include specially designed resources, such as clinical algorithms, slide presentations, training and toolkits.

Specific distribution strategies include:

*Publication in full:* The guideline is available electronically at the ADA Evidence Analysis Library website and announced to all ADA Dietetic Practice Groups. The ADA Evidence Analysis Library will also provide downloadable supporting information and links to relevant position papers.

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# Vegetarian Nutrition

## VN: Benefits and Risks/ Harms of Implementation (2011)

Benefits and Risks/Harms of Implementing the Recommendations

Safety issues must be reviewed carefully for each individual. General benefits and risks associated with implementation of the guideline are addressed for each recommendation.

Potential Benefits

A primary goal of implementing these recommendations includes improving a person's ability to achieve optimal nutrition through healthful plant-based food choices and a physically active lifestyle.

Although costs of medical nutrition therapy (MNT) sessions and reimbursement vary, MNT is essential for improved outcomes. Medical nutrition therapy education can be considered cost effective when considering the benefits of nutrition interventions on the onset and progression of comorbidities vs. the cost of the intervention.

## Risk/Harm Considerations

When using these recommendations:

- Review the patient's age, [socioeconomic status](#), cultural issues, health history, and other health conditions
- Consider referral to a behavioral specialist if psychosocial issues are a concern
- Consider a referral to social services to assist patients with financial arrangements if economic issues are a concern
- Use clinical judgment in applying the guidelines when evaluating [vegetarian](#) patients or clients and pregnant [adolescents](#) and [adults](#)
- Some individuals who take [calcium supplements](#), particularly calcium carbonate, might experience gastrointestinal side effects including gas, bloating, and constipation. To alleviate these symptoms, consideration for another form of [calcium](#) may be warranted, as well as spreading out the calcium dose throughout the day and taking the supplement with meals (Office of Dietary Supplements).
- Since the optimal ratio of [EPA](#) and [DHA](#) are not known for vegetarians, very high levels of EPA and DHA may be contraindicated; over-supplementation should be avoided. The US Food and Drug Administration advises that consumption of more than three [grams of omega-3 fatty acids](#) per day may cause gastrointestinal symptoms.
- Care should be taken that pregnant patient or client micronutrient intake from all sources is not above the tolerable upper intake level ([UL](#)). Supplementation is only encouraged after assessment of dietary intake and supplementation intake.

In addition to the above, a variety of barriers may hinder the application of these recommendations.

- A [vegetarian dietary pattern](#) encompasses wide variations in foods eaten and complexity regarding dietary practices, beliefs and motivations. The RD should maintain flexibility and acceptance to support the lifestyle choices in working with this population. See the Guideline Overview for a more detailed explanation of the complexity of vegetarian dietary patterns.
- In some cases, there may be increased cost associated with the selective use of vitamin and mineral supplements
- Accessibility and costs of biochemical parameter testing should be considered.

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# Vegetarian Nutrition

## VN: Executive Summary of Recommendations (2011)

### Executive Summary of Recommendations

Below are the major recommendations and ratings for the Academy of Nutrition and Dietetics Vegetarian Nutrition (VN) Evidence-Based Nutrition Practice Guideline. More detail (including the evidence analysis supporting these recommendations) is available on this website to Academy members and EAL subscribers under Major Recommendations.

To see a description of the Academy Recommendation Rating Scheme (Strong, Fair, Weak, Consensus, Insufficient Evidence), [click here](#).

The Vegetarian Nutrition Recommendations are listed below. (Note: If you mouseover underlined acronyms and terms, a definition will pop-up.)

- [Nutrition Assessment](#)

#### **VN: Assessing Knowledge and Beliefs of Adult, Child and Adolescent Vegetarians**

For [adult](#), child and adolescent [vegetarians](#), the Registered Dietitian (RD) should assess knowledge and beliefs about a vegetarian diet. Research indicates that vegetarian [dietary patterns](#) vary and fluctuate over time. Even within types of vegetarian diets, individuals may not always include a variety of healthful foods in their diet. Vegetarians who are on highly restrictive diets resulting from unhealthful food choices, may be at nutritional risk. Specific nutrient considerations may need to be addressed in some vegetarian dietary patterns for optimal nutrition.

#### **Strong Imperative**

#### **VN: Assessing Motivations that Influence Vegetarian Dietary Lifestyle for Adults and Children**

For [adult](#), child and adolescent [vegetarians](#), the Registered Dietitian (RD) should assess reasons for following a vegetarian lifestyle. Research indicates that the motivations for being vegetarian (e.g., health, ethical, environmental, cultural or religious, etc.) influence dietary practices which may impact nutrient intake. [Dietary patterns](#) based on health beliefs may be more flexible than dietary patterns based on religious or moral convictions.

#### **Strong Imperative**

#### **VN: Assessing for Signs of Disordered Eating Behaviors Among Adolescent and Young Adult Vegetarians**

In [adolescent](#) (13-18) and young adult (19 to 30 years) [vegetarians](#), the Registered Dietitian (RD) should assess for problem behaviors such as dieting. Research finds that a subset of vegetarian adolescents and young adults shows higher patterns of unhealthful dieting practices than [omnivores](#) or more health conscious vegetarians of the same age.

#### **Fair Imperative**

#### **VN: Assessing Micronutrient Needs in Pregnant Adolescent and Adult Vegetarians**

For pregnant [adolescent](#) and [adult vegetarians](#), the Registered Dietitian (RD) should assess the patient's/client's intake of all micronutrients, particularly folate, [vitamin B-12](#), iron, and zinc to ensure the [Dietary Reference Intakes](#) (DRI) are met. Research indicates that pregnant vegetarians did not meet dietary requirements for at least one of these micronutrients. Two high quality studies report that pregnant vegetarians had significantly lower serum B-12 concentrations than pregnant non-vegetarians. In addition, research studies measuring [methylmalonic acid](#) (MMA) levels, showed that the prevalence of vitamin B-12 deficiency among healthy, non-pregnant adult vegetarians ranged from 30% to 86%. When [vegans](#) and [lacto-ovo vegetarians/ lacto-vegetarians](#) (LOV/LV) were analyzed separately, vegans had even higher proportions of vitamin B-12 deficiency (43% to 88%).



### Strong Conditional

#### **VN: Assessing Macronutrient Needs in Pregnant Adolescent and Adult Vegetarians**

For pregnant adolescent and adult vegetarians and vegans, the Registered Dietitian (RD) should assess for adequate protein from a variety of complementary mixtures of plant proteins consumed throughout the day, compared to the Dietary Reference Intakes (DRI) in pregnancy. While research indicates that pregnant vegetarians typically had lower protein intake than pregnant omnivores, they met or exceeded the national standards for protein intake for pregnant women in the populations studied.

### Strong Imperative

#### **VN: Assessing Essential Fatty Acid Intake of Pregnant Adolescent and Adult Vegetarians**

For pregnant adolescent and adult vegetarians, the Registered Dietitian (RD) should assess dietary intake of essential fatty acids (EFA). Some research suggests that blood and tissue eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) levels may be sub-optimal among patients who follow a vegetarian dietary pattern.

### Consensus Imperative

#### **VN: Assessing Biochemical Data of Adult, Child and Adolescent Vegetarians**

For adult, child and adolescent vegetarians for whom dietary assessment reveals inadequate intake, the Registered Dietitian (RD) should assess the biochemical data, medical tests and procedures including, but not limited to complete blood count (CBC), serum iron, ferritin, transferrin, vitamin B-12, zinc, vitamin D and essential fatty acids (EFA). Research suggests that intake and/or bioavailability of these nutrients may be of special concern for vegetarian or vegan adults, adolescents and children. Assessment of these factors is needed to effectively determine nutrition diagnoses and plan the nutrition interventions. Inability to achieve optimal nutrient intake may contribute to poor outcomes.

### Consensus Imperative

#### **VN: Assessing Vitamin B-12 Status of Adult, Child and Adolescent Vegetarians**

For adult, child and adolescent vegetarians, the Registered Dietitian (RD) should assess for dietary adequacy of vitamin B-12 intake. If dietary intake of vitamin B-12 is inadequate, then the RD may recommend using methylmalonic acid (MMA) if available, as a functional indicator of deficiency. Two research studies measuring MMA levels showed that lacto-ovo vegetarian and lacto-vegetarian (LOV/LV) or omnivorous adolescents (9 to 15 years) who had followed a very restrictive vegetarian diet (macrobiotic) early in life, may be at risk for vitamin B-12 deficiency (41% of adolescents had MMA >290 nmol/L and 21% had MMA >410nmol/L). In addition, research studies showed that the prevalence of vitamin B-12 deficiency among healthy, non-pregnant adult vegetarians ranged from 30% to 86%. When vegans and LOV/ LV vegetarians were analyzed separately, vegans had even higher proportions of vitamin B-12 deficiency (43% to 88%). Among children (10 months to 11.7 years) and older adults (>55 years), the prevalence of vitamin B-12 deficiency was 55 to 85% and 46.9% to 68%, respectively.

### Fair Imperative

#### **VN: Assessing Micronutrient Intake of Adolescent Vegetarians**

For adolescent vegetarians, the Registered Dietitian (RD) should assess micronutrient intake, particularly iron, zinc, vitamin C and vitamin B-12. Research from a limited number of Western countries indicates that adolescent vegetarians or semi-vegetarians (11 to 19 years) may have lower intake than national standards for micronutrients such as iron, zinc and vitamin C. In addition, two studies measuring methylmalonic acid (MMA) levels showed that lacto-ovo vegetarian/ lacto-vegetarian (LOV/LV) or omnivorous adolescents (9 to 15 years) who had followed a very restrictive vegetarian diet (macrobiotic) early in life, may be at risk for vitamin B-12 deficiency (41% of adolescents had MMA >290 nmol/L and 21% had MMA >410nmol/L).

### Strong Imperative

#### **VN: Assessing Dietary Intake of Adolescent Vegetarians**

For adolescent vegetarians, the Registered Dietitian (RD) should assess intake of foods rich in calcium (e.g., dairy products, kale, broccoli, fortified soy milk, etc.). Research indicates that although dietary patterns differ among countries, adolescent vegetarians (11 to 19 years) tended to consume fewer dairy products.

### Strong Imperative

#### **VN: Assessing Micronutrient Intake of Vegetarian Children**

For vegetarian children, the Registered Dietitian (RD) should assess micronutrient intake, particularly vitamin B-12. Research studies measuring methylmalonic acid (MMA) levels, indicate that small children (10 months to 11.7 years) of parents who follow a macrobiotic diet, had a high prevalence of vitamin B-12 deficiency (55 to 85%).

### Weak Imperative

#### **VN: Assessing Macronutrient Intake of Child and Adolescent Vegetarians**

For child and adolescent vegetarians, the Registered Dietitian (RD) should assess intake of protein and essential fatty acids (EFA). While meeting protein requirements is typically not an issue with vegetarian diets, the RD can recommend that children and adolescents include complementary mixtures of plant proteins. This can be achieved by consuming a varied diet throughout the day. In addition, some research suggests that blood and tissue eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) levels may be sub-optimal among patients who follow a vegetarian dietary pattern.

### Consensus Imperative

#### **VN: Assessing Micronutrient Intake of Adult Vegetarians**

For adult vegetarians, the Registered Dietitian (RD) should assess micronutrient intake, particularly vitamin B-12. Research studies measuring methylmalonic acid (MMA) levels, showed that the prevalence of vitamin B-12 deficiency among healthy, non-pregnant adult vegetarians ranged from 30% to 86%. When vegans, lacto-ovo vegetarians/ lacto-vegetarians (LOV/LV) were analyzed separately, vegans had even higher proportions of vitamin B-12 deficiency (43% to 88%). Among older adults (>55 years), the prevalence of vitamin B-12 deficiency was 46.9% to 68%.

### Fair Imperative

#### **VN: Assessing Protein Intake of Adult Vegetarians**

For adult vegetarians, the Registered Dietitian (RD) should assess intake of protein. While meeting protein requirements is typically not an issue with vegetarian diets, the RD can recommend that adults include complementary mixtures of plant proteins. This can be achieved by consuming a varied diet throughout the day.

## Consensus Imperative

### VN: Assessing Essential Fatty Acid Intake of Adult Vegetarians

For adult vegetarians, the Registered Dietitian (RD) should assess dietary intake of essential fatty acids (EFA). Some research suggests that blood and tissue eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) levels may be sub-optimal among patients who follow a vegetarian dietary pattern.

## Consensus Imperative

### • Nutrition Intervention

### VN: Treating Hyperlipidemia with a Vegetarian Diet for Adults

If consistent with patient or client preference, the Registered Dietitian (RD) may recommend and educate on the benefits of a vegetarian diet for adults seeking treatment to lower total cholesterol (TC) and low-density lipoprotein-cholesterol (LDL-C) levels, or if appropriate, to reduce weight. Research shows that various types of vegetarian diets (e.g., vegetarian Ornish, Portfolio diet, ovo-lacto vegetarian and vegan) lower TC from 7.2% to 26.6% and lower LDL-C from 8.7% to 35% (with five of the eight studies that provided comparison data showing a decrease between 10% and 20% for both TC and LDL-C). Vegan diets lower both TC and LDL-C more than other types of vegetarian diets.

## Strong Conditional

### VN: Micronutrient Intake in Pregnant Adolescent and Adult Vegetarians

For pregnant adolescent and adult vegetarians, the Registered Dietitian (RD) should design a nutrition prescription to ensure the Dietary Reference Intakes (DRI) for all micronutrients are met. If unable to meet the DRI for recommended levels of micronutrients, particularly iron, folate and zinc, the RD should recommend supplementation to ensure adequate intake. Research indicates that pregnant vegetarians did not meet dietary requirements for at least one of these micronutrients.

## Fair Conditional

### VN: Vitamin B-12 Intake in Pregnant Adolescent and Adult Vegetarians

For pregnant adolescent and adult vegetarian or vegan patients or clients, the Registered Dietitian (RD) should design a nutrition prescription to ensure vitamin B-12 requirements are met by diet and/or supplementation, including prenatal supplements. Two high quality studies report that lacto-ovo vegetarian pregnant women are less likely than non-vegetarian pregnant women to meet dietary requirements for vitamin B-12 intake, and two high quality studies report that pregnant vegetarians had significantly lower serum B-12 concentrations than pregnant non-vegetarians. In addition, twelve studies measuring methylmalonic acid (MMA) levels, showed that the prevalence of vitamin B-12 deficiency among healthy, non-pregnant adult vegetarians ranged from 30% to 86%. When vegans and lacto-ovo vegetarians/lacto-vegetarians (LOV/LV) were analyzed separately, vegans had even higher proportions of vitamin B-12 deficiency (43% to 88%).

## Fair Imperative

### VN: Nutrition Counseling to Support Therapeutic Vegetarian Diets for Adults

If a vegetarian diet is proposed as a therapeutic diet according to stage in the life cycle and disease state for adults, the Registered Dietitian (RD) should employ a variety of counseling approaches and strategies to promote adherence to the diet. Research shows that intensive support (e.g., frequent encounters, cooking demonstration, incentives, etc.) can improve nutrition-related outcomes when using a vegetarian diet therapeutically; and nutrition counseling strategies such as motivational interviewing, can improve adherence to recommendations and diet-related outcomes.

## Strong Conditional

### VN: Diet Diversity of Vegetarian Diets for Children, Adolescents and Adults

If the adult, child or adolescent patient or client is on a highly restrictive vegetarian diet with a narrow range of food choices, then the Registered Dietitian (RD) should educate them on the importance of including a variety of foods within their diet to meet their nutritional needs. When appropriate, vitamin and/or mineral supplements may be indicated. Research shows that vegetarian dietary patterns vary and fluctuate over time. Even within types of vegetarian diets, individuals vary in the extent to which they include a variety of plant-based foods. Vegetarians who are on highly restrictive diets resulting from unhealthful food choices, may be at nutritional risk.

## Strong Conditional

### VN: Protein Intake of Pregnant Adolescent and Adult Vegetarians

For pregnant adult and adolescent vegetarians and vegans, the Registered Dietitian (RD) should develop a nutrition prescription and offer comprehensive nutrition education and skill development on planning a diet which provides adequate protein from a variety of complementary mixtures of plant proteins consumed throughout the day. While research indicates that pregnant vegetarians typically had lower protein intake than pregnant omnivores, they met or exceeded the national standards for protein intake for pregnant women in the populations studied.

## Weak Imperative

### VN: Essential Fatty Acid Intake of Pregnant Adolescent and Adult Vegetarians

For the pregnant adolescent or adult vegetarian, if nutrition assessment of intake or blood levels of eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) reveals a potential deficiency or lower than optimal levels, the Registered Dietitian (RD) should counsel the patient or client to increase EPA and DHA levels by any of the following methods (as appropriate based on RD clinical judgment):

- Increasing intake of foods rich in EPA and DHA
- EPA and DHA supplementation
- Increase endogenous synthesis of essential fatty acids (EFA) by decreasing intake of omega-6 fatty acid as well as reducing the amount of saturated fat and trans fat in the diet.

## Consensus Conditional

### VN: Treating Type 2 Diabetes with a Vegetarian Diet for Adults

If consistent with patient or client preference, the Registered Dietitian (RD) may recommend and educate on the benefits of the therapeutic use of a vegetarian diet for adults seeking treatment for Type 2 diabetes. Research indicates that a vegetarian diet may decrease or maintain blood glucose levels; a vegan diet may decrease hemoglobin A1c (A1c), as well as, or better than an omnivorous diet. Additionally, a vegetarian diet may reduce diabetes-related co-morbidities (e.g., cardiovascular disease, obesity, and hypertension).

## Fair Conditional

### VN: Treating Overweight and Obesity with a Vegetarian Diet for Adults

If consistent with patient or client preference, the Registered Dietitian (RD) may recommend and educate on the benefits of the therapeutic use of a vegetarian diet for adults seeking treatment for overweight or obesity. Research indicates

that the therapeutic use of a vegetarian diet is effective for treating overweight and obesity in both the short term (less than one year) and longer term (greater than one year), and may perform better than alternative omnivorous diets for the same purpose. Percent weight loss ranged from 3.2% to 9.3% at 12 months across studies.

### Strong Conditional

#### **VN: Micronutrient Intake of Adolescent Vegetarians**

For adolescent vegetarians, the Registered Dietitian (RD) should specifically plan foods rich in micronutrients, such as iron, zinc, vitamin C and vitamin B-12 into the diet to meet the Dietary Reference Intakes (DRI). When appropriate, vitamin and/or mineral supplements may be indicated to prevent or resolve nutrient deficiency. Research from a limited number of Western countries showed that adolescent vegetarians or semi-vegetarians (11 to 19 years) may have lower intake than national standards for micronutrients such as iron, zinc and vitamin C. In addition, two studies measuring methylmalonic acid (MMA) levels showed that lacto-ovo vegetarian and lacto-vegetarian (LOV/LV) or omnivorous adolescents (9 to 15 years) who had followed a very restrictive vegetarian diet (macrobiotic) early in life, may be at risk for vitamin B-12 deficiency (41% of adolescents had MMA >290 nmol/L and 21% had MMA >410nmol/L).

### Fair Imperative

#### **VN: Dietary Intake of Adolescent Vegetarians**

For adolescent vegetarians, the Registered Dietitian (RD) should recommend a meal plan that incorporates foods rich in calcium (e.g., dairy products, kale, broccoli, fortified soy milk, etc.) or if appropriate, calcium supplements. Research indicates that although dietary patterns differ, adolescent vegetarians (11 to 19 years) tended to consume fewer dairy products.

### Strong Imperative

#### **VN: Micronutrient Intake of Vegetarian Children**

For vegetarian children, the Registered Dietitian (RD) should design a nutrition prescription to ensure the Dietary Reference Intakes (DRI) for all micronutrients, particularly vitamin B-12 are met. If appropriate, vitamin and/or mineral supplements may be needed to prevent or resolve nutrient deficiency. Research studies measuring methylmalonic acid (MMA) levels, indicates that small children (10 months to 11.7 years) of parents who follow a macrobiotic diet, had a high prevalence of vitamin B-12 deficiency (55 to 85%).

### Weak Imperative

#### **VN: Micronutrient Intake of Adult Vegetarians**

For adult vegetarian patients or clients, the Registered Dietitian (RD) should design a nutrition prescription to ensure the Dietary Reference Intakes (DRI) for all micronutrients, particularly vitamin B-12 are met. When appropriate, vitamin and/or mineral supplements may be indicated to prevent or resolve nutrient deficiency. Research studies measuring methylmalonic acid (MMA) levels showed that the prevalence of B-12 deficiency among healthy, non-pregnant adult vegetarians ranged from 30% to 86%. When vegans and lacto-ovo vegetarians/ lacto-vegetarians (LOV/LV) were analyzed separately, vegans had even higher proportions of vitamin B-12 deficiency (43% to 88%). Among older adults (>55 years), the prevalence of vitamin B-12 deficiency was 46.9% to 68%.

### Fair Imperative

#### **Vegetarian Nutrition (VN) Protein Intake of Adult, Child and Adolescent Vegetarians**

For adult, child and adolescent vegetarians, the Registered Dietitian (RD) should develop a nutrition prescription providing adequate protein, and offer comprehensive nutrition education and skill development on planning a diet which provides a variety of protein foods. While meeting protein requirements is typically not an issue with vegetarian diets, the RD can recommend including complementary mixtures of plant proteins. This can be achieved by consuming a varied diet throughout the day.

### Consensus Imperative

#### **VN: Essential Fatty Acid Intake of Adult, Child and Adolescent Vegetarians**

In the adult, child or adolescent vegetarian, if nutrition assessment of intake or blood levels of eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) reveals a potential deficiency or lower than optimal levels, the Registered Dietitian (RD) should counsel the patient or client to increase EPA and DHA levels by any of the following methods (as appropriate based on RD clinical judgement):

- Increasing intake of foods rich in EPA and DHA
- EPA and DHA supplementation
- Increase endogenous synthesis of essential fatty acids (EFA) by decreasing intake of omega-6 fatty acid as well as reducing the amount of saturated fat and trans fat in the diet.

### Consensus Conditional

#### • Nutrition Monitoring and Evaluation

#### **VN: Adherence to a Vegetarian Therapeutic Diet for Adults**

For adult patients or clients, the Registered Dietitian (RD) should monitor and evaluate adherence to a therapeutic vegetarian diet. Research indicates that these diets appear to perform as well and possibly better than omnivorous diets in terms of attrition rate, provided that patients receive nutrition education and appropriate dietary support. Many factors may influence the adherence to a diet, such as disease state, length of intervention, restrictiveness, and patient support.

### Strong Imperative

#### **VN: Adherence to Vegetarian Diets for Treatment of Obesity and Overweight for Adults**

For adult patients or clients seeking treatment for overweight or obesity with a vegetarian diet, the Registered Dietitian (RD) should monitor and evaluate adherence and provide continued nutrition education support. Research shows lower compliance rates for weight loss patients vs. patients treated for other disease states.

### Strong Imperative