Considerations in planning vegan diets: Infants

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ABSTRACT

Appropriately planned vegan diets can satisfy nutrient needs of infants. The American Dietetic Association and The American Academy of Pediatrics state that vegan diets can promote normal infant growth. It is important for parents to provide appropriate foods for vegan infants, using guidelines like those in this article. Key considerations when working with vegan families include composition of breast milk from vegan women, appropriate breast milk substitutes, supplements, type and amount of dietary fat, and solid food introduction. Growth of vegan infants appears adequate with post-weaning growth related to dietary adequacy. Breast milk composition is similar to that of non-vegetarians except for fat composition. For the first 4 to 6 months, breast milk should be the sole food with soy-based infant formula as an alternative. Commercial soymilk should not be the primary beverage until after age 1 year. Breastfed vegan infants may need supplements of vitamin B-12 if maternal diet is inadequate; older infants may need zinc supplements and reliable sources of iron and vitamins D and B-12. Timing of solid food introduction is similar to that recommended for non-vegetarians. Tofu, dried beans, and meat analogs are introduced as protein sources around 7-8 months. Vegan diets can be planned to be nutritionally adequate and support growth for infants. *J Am Diet Assoc. 2001;101:670-677.*

The period from birth to 1 year is a time of nutritional vulnerability when attention to proper nutrition is critical to support the extremely rapid growth, including brain growth, seen during this period. Throughout this first year, breast milk or infant formula provides a large portion of the energy and protein needed by both vegan and nonvegan infants. The first solid foods that are offered to most infants are infant cereals, fruits, and vegetables with meats not introduced until later. Both the American Dietetic Association and the American Academy of Pediatrics assert that well-planned vegan diets can satisfy nutrient needs of infants and promote normal growth (1, 2). It is important for parents to be aware of and provide appropriate foods for vegan infants, using guidelines such as those found in this article.

The purpose of this paper is to identify important issues in the feeding of vegan infants and to provide recommendations which will help dietetics professionals work with the families of vegan infants to plan diets which meet needs for growth and development, are age-appropriate, practical, and in keeping with the family's beliefs.

GROWTH OF VEGAN INFANTS

A limited number of studies have examined the birth weights of infants of vegan mothers. A study of close to 400 infants and children, 75% of whose mothers used vegan diets throughout pregnancy, found birth weights and incidence of low-birth-weight infants to be similar to those of well-educated US white women (3). The reported birth weights of 19 term infants born to vegan women were slightly lower than infants with non-vegetarian mothers (4). Lower birth weights of infants of Dutch women following macrobiotic diets, which exclude most animal products as well as a number of other foods, have been

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attributed to low maternal weight gain (5, 6). With appropriate maternal weight gain and food choices throughout pregnancy, birth weights of vegan infants should be within the range seen in infants of healthy non-vegetarian women.

During the first 6 months after birth, most infants, vegan or not, receive primarily breast milk or infant formula. Healthy infants who receive appropriate amounts of either breast milk from women eating adequate vegan diets or soy-based infant formula thrive during early infancy (7, 8). There is some evidence of early poor growth in infants of macrobiotic women that appears to be due to inadequate amounts of breast milk (6).

We have very limited information on growth of older vegan infants. One study had 31 subjects who were less than 2 years old; 73 percent were on vegan diets from birth (3). Subjects' weight for age was similar to the National Center for Health Statistics (NCHS) reference values; subjects tended to be slightly shorter than the median of the reference population (–0.24 cm for less than 1 year old) (3). Clearly additional research is needed in this area especially in view of the high availability of appropriate foods to support growth of young vegan children.

BREAST MILK OF VEGAN WOMEN

Nutrients in breast milk most sensitive to maternal diet are most of the B vitamins and vitamins A, C, and D (9). Mineral content, total fat, and cholesterol content are not significantly affected by maternal diet. Although total fat content of breast milk of vegan women is similar to that of omnivores, fat composition may vary depending on maternal intake. Sanders (10) found that milk of British vegan women was lower in saturated fat and eicosapentaenoic acid and higher in linoleic acid and linolenic acid. Other studies have shown higher concentrations of linoleic and linolenic acids in the breast milk of macrobiotic subjects (11, 12).

Although mineral content of breast milk varies little with diet, Dagnelie and co-workers (12) found slightly decreased levels of both magnesium and calcium in the milk of macrobiotic women. However, Specker (13) reported that the low calcium intake of macrobiotic women did not result in lower calcium concentrations in their milk.

The vitamin D content of breast milk varies with maternal diet and sun exposure (14, 15) although concentration of active vitamin D is generally low in breast milk. Vitamin B-12 levels also vary with maternal diet. Some studies suggest that vitamin B-12 from maternal stores is not available to the breastfed infant (16) although not all research supports this (17).

Hughs and Sanders (18) found lower milk riboflavin concentrations in British vegans compared to omnivore subjects but values were similar to those for pooled milk samples in the United Kingdom.

Milk of vegan women was found to be lower in taurine compared to omnivores (19), but the levels were comparable to averages in the US population (20).

Vegan adults have a very low carnitine intake but have plasma carnitine concentrations similar to or slightly lower than omnivores (21). The carnitine content of breast milk from non-vegetarians is variable (22) and appears to be independent of maternal diet (23). Since maternal stores appear to contribute to breast milk carnitine content and vegans apparently synthesize an adequate amount of carnitine, breast milk carnitine concentrations of vegans would be expected to be adequate although carnitine levels in breast milk from vegan women have not been reported.

Table 1
Recommended supplements for breastfed vegan infants

Nutrient	Recommended amount
Vitamin K	Single dose at birth: 0.5-1.0 mg intramuscularly or 1.0-2.0 mg orally
Vitamin D	200 IU (5 μg) beginning at 3 months for at risk infants (infants who do not have adequate sun exposure, or live in northern climates or are dark-skinned)
Iron	1 mg/kg/day beginning at 4 to 6 months
Vitamin B-12	0.4 μg/d beginning at birth; 0.5 μg/d beginning at age 6 months unless maternal diet is adequate
Fluoride	0.25 mg/day beginning after 6 months if water contains less than 0.3 ppm fluoride
Zinc	Should be considered for older infants; see text

Although isoflavone content of milk can be increased up to 10-fold when the maternal diet includes soyfoods (24), the daily isoflavone intake of breastfed infants remains negligible (25).

There appear to be differences in concentrations of environmental contaminants between milk of vegetarian and omnivore women with levels of contaminants related to frequency of consumption of meat, fish, and dairy foods (12). Breast milk of vegans is reportedly lower in environmental pollutants such as DDT, chlordane, and polychlorinated biphenyls and in most cases levels were just 1 to 2 percent of those seen in the general population (26).

DOCOSAHEXAENOIC ACID IN DIETS OF BREASTFED VEGAN INFANTS

Docosahexaenoic acid (DHA) is a long chain n-3 fatty acid present in all cells of the body and found in especially high concentrations in the brain and retina. Since DHA is found primarily in fish and eggs, vegans do not consume it but depend on endogenous synthesis from the n-3 fatty acid linolenic acid. A low ratio of linoleic acid/linolenic acid in the diet maximizes conversion (27, 28). Some studies show decreased plasma DHA levels in vegans compared to omnivores (10, 29).

Infants who consume preformed DHA, either from breast milk or DHA-supplemented formula, have higher levels of DHA in the circulation (30), brain and retina (31). Early dietary intake of DHA has been associated with a performance advantage on psychomotor testing at 4 months (32) but not at 24 months (33), higher mental development scores at 18 months (34), improved visual acuity (35,36), and other benefits.

Breast milk DHA levels in vegan women appear to be lower than levels in lacto-ovo vegetarians and omnivores (4) but are still higher than levels in commercial infant formula (which lacks DHA in North America) (37). Breastfed vegan infants have lower erythrocyte DHA levels than do breastfed infants of omnivores (4).

Both term and preterm infants can synthesize DHA from linolenic acid (38-40). One possible way to promote DHA synthesis in breastfed vegan infants is to increase milk linolenic acid content. Lactating vegan women should be advised to include sources of linolenic acid in their diet (ground flaxseed, flaxseed oil, canola oil, soybean oil) and to limit linolenic acid intake to enhance synthesis of DHA. DHA supplementation of lactating women with a high DHA-triacylglycerol produced by algae is being studied (41,42).

Table 2
Suggested feeding schedule for vegan infants, age 4 to 12 months

Food	4-6 mo	6-8 mo[a]	9-10 mo	11-12 mo
Milk	Human milk or soy formula	Human milk or soy formula	Human milk or soy formula	Human milk or soy formula
Cereal and bread	Iron-fortified infant cereal (can be delayed until 6 mo)	Infant cereal, crackers, toast, unsweetened dry cereal	Infant cereal, crackers, toast, unsweetened dry cereal, soft bread	Infant cereal, crackers, toast, unsweetened dry cereal, soft bread, rice, pasta
Fruits	None	Strained fruit, fruit juice	Soft or cooked fruit, fruit juice	Soft, canned or cooked fruit, peeled raw fruit, fruit juice
Vegetables	None	Strained vegetable, vegetable juice	Soft, cooked mashed vegetable, vegetable juice	Soft, cooked pieces of vegetable, vegetable juice
Legumes	None	Tofu, pureed legumes, soy yogurt (at 7-8 mo)	Tofu, pureed legumes, soy cheese, soy yogurt	Tofu, mashed legumes, soy cheese, soy yogurt, bite-sized pieces of soy burger, tempeh

[a]Overlap of ages occurs because of varying rate of development.

MILK FOR VEGAN INFANTS

Human milk is the optimal food for all infants. The advantages of breastfeeding are numerous (43). The American Academy of Pediatrics recommends human milk as the exclusive nutrient source for full-term infants for the first 6 months after birth (44). They also recommend that breastfeeding be continued for at least the first 12 months along with appropriate supplementary foods (44). Many vegan women choose to breastfeed longer than this (45) and this practice should be supported.

Commercial infant formulas are recommended for infants who are not breastfed or who are weaned before 1 year of age. Standard formulas are based on modified cow's milk and are not suitable for vegan infants. Soy-based formulas are based on methionine-fortified soy protein isolate. Infants exclusively fed soy-based formula grow and develop normally (8, 46). Although some brands may contain vitamin D and, more rarely, fats derived from animal sources, soy-based formulas are the only option for vegan infants who are not breastfed (8). There are no commercial formula options that do not contain animal products for vegan infants who cannot tolerate soy formula. Similarly, all commercial formulas for premature infants contain animal products.

Some concerns have been expressed about the use of soy-based formulas in infancy (47,48) because of the high isoflavone concentration of these formulas (25). Plasma levels of soy isoflavones seen in infants fed soy formula are significantly higher than those seen in infants fed cow-milk formula or breast milk (25). Phytoestrogens of the isoflavone class such as genistein, daidzein, and their glycosides, which are found in products containing soy protein, are associated with numerous hormonal and nonhormonal actions (49). The effect of early exposure to soy isoflavones is an area of active research (50). Soy-based infant formulas have been used for more than 30 years (49) and soy products are regularly given to infants in Asian countries (51) with no apparent adverse effect, although the long-term effects have not been studied. Preliminary data suggest no hormonal effects (52) or alteration in immune function (53) with soy formula use. Setchell (49) suggests that exposure to soy-based formulas in infancy may actually be beneficial in protecting against hormone-dependent diseases later in life.

The occasional reports of nutritional problems in vegan or vegetarian infants are often due to use of a homemade formula in the first year after birth (54-58). Products such as commercial or home-prepared soymilk, rice milk, nut or seed milk; nondairy creamer; water-based cereal porridge; or mixtures of fruit or vegetable juices should not be used to replace breast milk or commercial infant formula for infants under one year. These foods do not contain the proper ratio of macronutrients nor do they have adequate amounts of many vitamins and minerals.

Whole cow's milk should not be introduced for non-vegan infants until after the first year because of its low concentration and bioavailability of iron and because of the inappropriately higher intake of protein, sodium, potassium, and chloride associated with cow's milk (59). Cow's milk also contains limited amounts of essential fatty acids, vitamin E, and zinc (59).

Commercial soymilk should not be introduced before the end of the first year for similar reasons. While soymilk does contain more iron than cow's milk and has similar levels of zinc, the bioavailability of iron and zinc from soy products appears to be relatively low (60,61). By age one year, foods such as dried beans, whole grains, and vegetables can add to the iron and zinc level of the infant's diet and, together with commercial soymilk (and possibly supplemental zinc and iron), can lead to an adequate intake of iron and zinc.

Regular full-fat soymilk provides protein and sodium at levels similar to that in cow's milk. Potassium in soymilk is somewhat higher than in cow's milk. Soymilk is a source of both linoleic acid and alpha-linolenic acid.

We believe that commercial, fortified, full-fat soymilk can be added to the diet of vegan infants starting at age 1 year or older provided that the child is growing normally; has an appropriate weight and height for age; and is eating a variety of table foods including soy products, dried beans, grains, fruits, and vegetables. Following introduction of fortified soymilk, parents should continue to offer breast milk or commercial soy-based infant formula as a supplementary beverage until the child is at least 2 years old or is able to regularly drink 24 ounces of soymilk daily. Choosing unflavored varieties of soymilk in preference to flavored varieties such as vanilla, cocoa, or carob can help to avoid a preference for very sweet beverages by the young child. The total fat content of full-fat soymilk is similar to that of reduced fat (2%) cow's milk. Therefore, other foods

Table 3
Sample menu, approximate nutrient analysis, and comparison with the RDA for a 9-month-old vegan infant

Breakfast	**Lunch**	**Dinner**
Iron-fortified infant cereal (¼ c) with wheat germ (2 tsp)	Tofu, mashed (1 oz)	Iron-fortified infant cereal (¼ c) with wheat germ (2 tsp)
Breast milk (6 oz)[a]	Broccoli, steamed and chopped (1 Tbsp)	Kidney beans, mashed (2 Tbsp)
	Banana, mashed (2 Tbsp)	Winter squash, mashed (1 Tbsp)
	Whole wheat bread (¼ slice)	Applesauce (1 Tbsp)
	Breast milk (6 oz)	Breast milk (6 oz)
Snack 1	**Snack 2**	
Apple juice, fortified with vitamin C and calcium (4 oz)	Breast milk (6 oz)	
Whole wheat bread (¼ slice)	Graham cracker (1)	

Approximate nutrient analysis of menu and comparison with RDA

Nutrient	Analyzed value	%RDA[b]
Energy (kcal)[c]	867	96
Protein (g)	19	136
(% of kcal)	9	
Carbohydrate (g)	118	
(% of kcal)	54	
Total fat (g)	38	
(% of kcal)	39	
Calcium (mg)	643	238
Iron (mg)	14.0	127
Sodium (mg)	415	
Zinc (mg)	4.1	137
Vitamin A (μg)	549	110
Vitamin C (mg)	76	152
Thiamin (mg)	1.0	333
Riboflavin (mg)	0.7	175
Niacin (mg)	10.6	265
Folate (μg)	127	159
Vitamin B-6 (mg)	0.5	167
Vitamin B-12 (μg)	0.3[d]	60
Dietary fiber (g)	5.0	

[a]Soy-based formula can be substituted for breast milk. Some infants will omit milk/formula at meals and include it for snacks instead.
[b]Based on (63, 70, 78-80).
[c]Based on a 9 kg infant.
[d]The level of vitamin B-12 varies depending on maternal diet. It is assumed that maternal diet contains adequate vitamin B-12.

- Baby foods should be prepared without added salt, sugar, or spices.
- Foods should be well washed, cooked thoroughly, and blended or mashed to appropriate consistency.
- Strings, skins, and seeds should be removed from fruits and vegetables.
- Cooked legumes should be pressed through a sieve to remove skins.
- Home-prepared foods can be kept in the refrigerator for up to 2 days or frozen in small quantities for later use.
- Honey and corn syrup should not be given to infants younger than 1 year because these products can contain spores of Clostridium botulinum which can lead to infant botulism (2,82). (Honey is generally excluded from a vegan diet).
- Home-prepared or canned spinach, beets, turnips, carrots, or collard greens should not be given to infants before 4 months of age because the nitrate level in these foods can cause methemoglobinemia (2).
- Smooth nut and seed butters spread on bread or crackers should not be used until after the first birthday due to choking risk; in families with a strong history of allergy, peanuts and other nuts should not be introduced until age 3 years (2).

FIG. Guidelines for home preparation of baby foods for vegan infants.

that provide fat should be added to the diet of vegan infants so that dietary fat is not overly restricted (62).

Low-fat or non-fat soymilk should not be used for the first 2 years after birth because of their lower caloric density, just as low-fat and nonfat cow's milk should not be used by this age group (2). Rice milk is not recommended as a primary beverage for vegan infants and young children due to its low caloric density and low protein content.

SUPPLEMENTS FOR VEGAN INFANTS

With the exception of vitamin B-12 and possibly zinc, guidelines for supplementation of vegan infants are the same as for omnivore infants. Because maternal vitamin B-12 stores may not be available to the infant, and because infants require a sustained intake of vitamin B-12 to support rapid growth, it is important that all breastfed vegan infants receive a regular supplement of vitamin B-12 (0.4 μg/day for the first 6 months, 0.5 μg/day beginning at age 6 months) unless the mother's diet is regularly supplemented or includes vitamin B-12-fortified foods (63).

Zinc levels in human milk decline throughout lactation (64,65). As milk zinc declines, foods containing zinc are typically added to the infant's diet. Sources of zinc for vegan infants include zinc-fortified infant cereal and breakfast cereals, legumes, whole grains, wheat germ, and tofu. While these foods provide zinc, its bioavailability is reduced by the phytate found in whole grains and legumes. Practices such as using yeast-leavened whole grain breads and fermented soy products will improve zinc bioavailability (66,67) so that, depending on dietary choices, zinc intake of vegan infants may or may not be adequate.

The American Academy of Pediatrics does not recommend zinc supplements for vegan infants because clinical signs of zinc deficiency are rare among vegetarians (2). Others, however, recommend zinc supplementation of breastfed infants during the time when complementary foods are being introduced if the infant's diet is low in zinc or mainly includes zinc in forms that are not highly bioavailable (68,69). More information is needed on appropriate levels of zinc supplements where indicated for vegan infants. Guidelines from the Institute of Medicine propose an upper limit of zinc intake for 0.5-1 year of 5 mg/d, for 1-3 years, 7 mg/d (70). Nutrition care providers should give special consideration to zinc when evaluating diets of older vegan infants.

Although concentration of vitamin D in breast milk varies with maternal diet and sun exposure, the levels of active vitamin D are low in breast milk in general. Therefore, it is recommended that breastfed infants who do not have adequate sun exposure receive a supplement of 200 IU per day beginning at around age 3 months. Thirty minutes of sunlight exposure per week wearing only a diaper or 2 hours per week fully clothed without a hat appears to maintain adequate vitamin D levels in light-skinned infants in moderate climates (71). Dark-skinned infants and those who live at northern latitudes may be at risk for vitamin D deficiency, however, and vitamin D supplementation is advised in these cases.

The concentration of iron in human milk decreases over time and either supplements or fortified foods should be introduced for all breastfed infants beginning at around age 4 to 6 months. Depending on fluoridation of the water supply, fluoride supplements may be recommended after 6 months.

Infant soy formulas are fortified with vitamins and minerals including vitamin D, vitamin B-12, and trace minerals. Formula-fed infants may need supplemental fluoride after 6 months

if the water supply is not fluoridated. Finally, all infants receive a single dose vitamin K supplement at birth. Table 1 provides a summary of recommended supplements for breastfed vegan infants.

SOLID FOODS FOR VEGAN INFANTS

Guidelines for introducing solid foods for vegan infants are the same as those for non-vegetarian infants (1). Either breast milk or commercial infant formula provides adequate nutrition for infants until somewhere in the middle of the first year. The infant's individual growth and development pattern provides the best guideline for when to introduce solid food, rather than the infant's age (2). However, solid foods should be introduced by age 6 months (2). Table 2 provides a suggested schedule for introducing solid foods (72).

An iron-fortified infant cereal is a reasonable first food for vegan infants as it provides a source of energy and iron in an easily digested form. Rice cereal is most commonly used because it is hypoallergenic. Breast milk or formula feedings should continue as usual. If iron-fortified cereals are not used, breastfed infants should continue to receive an iron supplement. When cereals are well accepted, fruit, fruit and vegetable juices, and vegetables can be introduced; the order of their introduction is not critical (2). Fruits and vegetables should be well mashed or pureed. Juices should be introduced when the infant can drink from a cup. Juice intake should be limited since an excessive amount of juice (more than 8-10 ounces per day for an infant) can lead to diarrhea and failure to thrive (2, 73).

By age 7 to 8 months, good sources of protein besides breast milk or formula can be introduced. These include well-mashed or pureed cooked dried beans, mashed tofu, and soy yogurt. Infants should progress from mashed or pureed foods to pieces of soft food. Other grain foods such as soft, cooked pasta or rice, soft breads, dry cereals, and crackers can be introduced as the vegan baby becomes more adept at chewing. Gradual introduction of a variety of foods helps promote good eating habits (2).

As solid foods become a larger part of the diet, and increasingly replace breast milk or infant formula, it is important that the foods chosen be nutrient-dense. Some foods that provide concentrated sources of calories and nutrients are mashed firm tofu, bean spreads, mashed avocado, and cooked dried fruits. Regular meals and snacks can help to insure adequate energy intakes.

Current recommendations are to avoid restriction of fat in children under the age of 2 years, although some research suggests that reduced fat intakes after age 6 months do not compromise growth or nutrient intake (74-76) and that lower fat diets do improve lipid profiles in infants (74). Since fat is a concentrated source of calories, inclusion of soft margarine or vegetable oil in the older vegan infant's diet can be beneficial. Table 3 shows a sample menu for a vegan infant (77).

HOME PREPARATION OF INFANT FOODS

Many vegan parents will choose to use commercially prepared baby foods since there are products available for vegan infants. Commercial products contain limited selections for the older vegan infant so parents may opt to prepare their own baby foods. This practice should be encouraged since foods that are important in the diets of vegan children such as legumes, tofu, and leafy green vegetables are seldom available in commercial form and should be introduced early to increase later acceptability (81). The Figure provides guidelines for home preparation of baby foods for vegan infants.

ALLERGIES

Although many foods can cause allergic reactions in infants, vegan infants may be at somewhat reduced risk for food allergies since they do not consume cow's milk, the leading source of food allergy in young children. Foods most likely to cause allergic reactions in vegan infants include nut butters, peas, citrus fruits, corn products, soy products (including infant soy-based formula) and wheat. As for any infant, solid foods should be introduced as single ingredient foods, one at a time, at weekly intervals, to allow identification of food allergies (2).

Dietitians can play a key role in helping parents provide varied vegan diets for their infants that contain adequate amounts of nutrients and energy

Among healthy infants, soy-based formula may be less likely to provoke allergic responses than cow's milk formula (83). However, among high-risk infants, soy-based formula does not appear to have any relative value over cow's milk formula in the prophylaxis or prevention of allergic symptoms (84).

Based on the guidelines of the American Academy of Pediatrics (2) the following would be appropriate steps to reduce risk of allergy in vegan infants at high risk for allergy: 1)exclusive breastfeeding for the first 4 to 6 months; 2)elimination of all peanuts and tree nuts from maternal diet, 3)delayed introduction of peanuts and tree nuts until 3 years of age.

In addition to raising risk for allergy, early consumption of cow's milk, either as untreated cow's milk or in commercial infant formula has been linked to increased risk for insulin dependent diabetes mellitus in genetically susceptible infants (85, 86) although not all studies support this finding (87). It is not clear whether the findings represent a protective effect of breastfeeding or a possible risk associated with cow's milk feedings. Some evidence suggests that soy could raise risk for diabetes as well, based on studies of soybean meal in rodent models for diabetes (88-90). This would suggest that it is breastfeeding that is protective rather than avoidance of specific proteins. However, there are currently no epidemiological data to support the link between soy and diabetes risk. Animal studies suggest that there is no relationship between soy protein isolate, the primary component of soy-based infant formulas, and risk for diabetes (89,91).

MACROBIOTIC DIETS FOR INFANTS

Macrobiotic diets often differ from more usual vegan diets in important ways and, because a basic principle of macrobiotics is to eat in harmony with one's local environment, macrobiotic

practices also differ throughout the world. The diets typically do not include meat (although seafood is often included) or dairy foods and they restrict intake of fruit and certain vegetables. With careful planning, macrobiotic diets can meet the needs of infants. However, a number of studies have found serious nutrient deficiencies, particularly of vitamin B-12, calcium, and vitamin D, in breastfed and weaned macrobiotic children. In some macrobiotic families, it is common to wean children onto a grain-based formula that lacks vitamin B-12 and is low in calcium. Because macrobiotic practitioners often do not use processed foods, including many of the fortified vegan foods available, these diets may be considerably more restrictive than typical vegan diets and are more likely to produce nutritional deficiencies. Therefore, it is crucial that dietitians familiarize themselves with the principles of macrobiotic dietary planning, identify potential concerns, and identify acceptable strategies for meeting nutrient needs. Recently, leaders in the macrobiotic community have agreed to advise families about the introduction of cow's milk to children's diets to help meet needs for calcium and vitamin D (92). A more acceptable alternative for most macrobiotic families would be the use of fortified soymilk since soyfoods (specifically miso and tofu) are common foods in macrobiotic diets.

CONCLUSION

Appropriately planned vegan diets can meet the nutrition needs of infants and can support normal growth. Vegan infants under one year should ideally receive breast milk for all milk feedings. A commercial infant soy-based formula is another option. Supplemental food should not be introduced before 4 to 6 months. Infants should be given supplements as prescribed by the health care provider. These will include iron and possibly vitamins D and B-12 and zinc for the breastfed vegan infant. Dietitians can play a key role in helping parents provide varied vegan diets for their infants that contain adequate amounts of nutrients and energy.

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