

# Milk Sensitivity/ Allergy

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The prevalence of cow's milk allergy is approximately 2.5% for infants and young children in the first three years of life. However, as many as 80% of these children outgrow their sensitivity to cow's milk or develop tolerance by 4 years of age. This report provides background information on the prevalence, symptoms, diagnosis, and management of cow's milk protein allergy, including recommendations by the American Academy of Pediatrics. It discusses the potential nutritional consequences of milk avoidance and emphasizes the importance of nutritional counseling and growth monitoring in children diagnosed with cow's milk allergy.

## Scientific Status Report

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Milk sensitivity includes two very different biological reactions to certain components of cow's milk: lactose intolerance and milk allergy.<sup>1</sup> Both reactions have been studied extensively and consumers often confuse these two reactions with each other. For information on lactose intolerance (i.e., symptoms resulting from consuming relatively more lactose [milk sugar] than the ability to break it down by the intestinal enzyme, lactase), refer to the Lactose Intolerance Health Education Kit (<http://www.nationaldairyCouncil.org/EducationMaterials>).

Milk allergy is sensitivity to one or several cow's milk proteins, especially  $\beta$ -lactoglobulin, casein,  $\beta$ -lactalbumin, and bovine serum albumin. The condition occurs most often in infants and young children, particularly those with a family history of allergies (genetic predisposition).<sup>1-6</sup> Cow's milk allergy involves immune-mediated (IgE-mediated and non-IgE-mediated) reactions.<sup>1-6</sup> The onset of allergic symptoms varies from immediate (i.e., within a few minutes) to delayed (i.e., after an hour or even several days).<sup>2</sup> Symptoms tend to be nonspecific and can involve the gastrointestinal tract (e.g., abdominal pain, vomiting, diarrhea), respiratory tract (e.g., nasal congestion), and skin (e.g., rash).<sup>2</sup>

The diagnosis of cow's milk sensitivity is difficult because of the wide spectrum of clinical symptoms.<sup>2,3,6</sup> Other nonallergic diseases can mimic cow's milk protein sensitivity. To avoid the unnecessary elimination of cow's milk from the diet, it is important that reliable procedures be used to diagnose this condition.<sup>3,6</sup> There is no single test on which to base a diagnosis of cow's milk sensitivity other than to demonstrate a reproducible response to cow's milk elimination and challenge procedures under controlled clinical conditions.<sup>1-3,5,6</sup>

The generally accepted procedure to identify cow's milk allergy is to take a thorough medical and diet history and conduct tests such as the scratch skin test or blood tests such as RAST (radioallergosorbent) if a milk-specific IgE-mediated disorder is suspected. If both the history and allergy testing indicate milk as a potential allergen, the diagnosis is confirmed by well-defined elimination and subsequent challenge procedures.<sup>2,5,6</sup> The double-blind, placebo-controlled food challenge test is considered to be the "gold standard" to diagnose cow's milk protein allergy.<sup>1,6,7</sup> Children with a history of life-threatening clinical reactions to cow's milk or any other food should not be challenged in this manner.<sup>5</sup> Because of inherent risks, food challenge tests must be conducted by trained healthcare professionals at a medical facility with supervision and appropriate medicine and devices.<sup>1,2</sup>

The prevalence of cow's milk allergy in children is often overestimated, particularly by parents, and estimates vary widely.<sup>2,3,6,8,9</sup> When controlled elimination/challenge procedures are used to diagnose this condition, the prevalence of cow's milk allergy is approximately 2.5% for infants and young children in the first three years of life.<sup>3</sup> However, as many as 80% of these children outgrow their sensitivity to cow's milk or develop tolerance by 4 years of age.<sup>3</sup>

Treatment of existing cow's milk sensitivity should be aimed at relieving allergic symptoms without compromising nutritional status and growth.<sup>2,3,6</sup> Children who avoid milk due to milk allergy may be at risk of calcium and vitamin D deficiencies, low bone mineral status, and fractures.<sup>6,10-13</sup> A study found that preschool children with cow's milk allergy or multiple food allergies were at higher risk of calcium and vitamin D deficiencies than children without food allergies.<sup>10</sup> The researchers emphasize the importance of nutrition counseling to help avoid nutrient deficiencies in children with food allergies.<sup>10</sup> Young children with cow's milk protein allergy who follow a cow milk-free diet have been shown to be at risk of developing rickets and osteoporosis.<sup>11</sup> Calcium and vitamin D supplementation is important during a milk-free

diet, and children with transient cow's milk allergy should consume dairy products as soon as the results of milk challenge testing are negative.<sup>10,11</sup>

The American Academy of Pediatrics (AAP) recommends breastfeeding as the optimal source of nutrition for infants through the first year of life or longer.<sup>3</sup> For infants with cow's milk allergy who are not breast fed, hypoallergenic formulas (i.e., extensively hydrolyzed or free amino acid-based) may be recommended to relieve symptoms.<sup>2,3</sup> For infants with a family history of allergies (i.e., high risk infants), exclusive breastfeeding vs. feeding cow's milk formula for at least four months may decrease the incidence of rashes and allergy to cow's milk.<sup>3,4</sup> For high-risk infants who are formula-fed, certain hypoallergenic formulas without cow's milk protein may delay or prevent the development of allergy to cow's milk.<sup>1,3,4</sup>

In terms of alternatives to cow's milk, the AAP does not recommend soy protein-based formulas for infants with documented allergy to cow's milk protein because 10% to 14% of these infants will also have a soy protein allergy.<sup>14</sup> There is no convincing evidence that use of soy-based infant formula will prevent allergy.<sup>1,3,4</sup>

While solid foods should not be introduced to infants before four to six months, further delaying their introduction, even of foods considered to be highly allergenic (e.g., fish, eggs, foods containing peanut protein), will not prevent allergies.<sup>3,4</sup> In fact, there is some evidence that delaying the introduction of cow's milk and other food products may increase, rather than decrease, the risk that a child will develop allergies in the first two years of life.<sup>15</sup> The role of early or regular oral exposure to dietary proteins to induce tolerance is an area of active research.<sup>16-18</sup> A study suggests that early exposure to small amounts of cow's milk protein as a supplement to breast-feeding may help protect against IgE-mediated cow's milk protein allergy in some infants.<sup>17</sup> However, further research is needed to determine the exact timing of cow's milk protein introduction and the mechanism of desensitization or tolerance.<sup>2,17</sup> There is insufficient evidence to support maternal dietary restriction of potentially allergenic foods (i.e., milk, eggs, nuts) during pregnancy or lactation to prevent atopic disease (atopic dermatitis, asthma, food allergy), with the possible exception of atopic eczema.<sup>1,4,19</sup> To avoid nutritional shortcomings, elimination diets should be undertaken only with the advice of a physician and/or a Registered Dietitian. Children diagnosed with cow's milk protein allergy should regularly receive nutritional counseling and growth monitoring.<sup>1</sup>

Because the dairy food group (milk, cheese, and yogurt) is a substantial contributor of many nutrients in the U.S. diet important for good health – calcium, potassium, phosphorus, protein, vitamin A, vitamin D, vitamin B12, riboflavin, and magnesium<sup>20</sup> — this food group should not be eliminated from the diet unless a sound medical reason supports this decision.

Since 2006, manufacturers have been required by law (the U.S. Food Allergen Labeling and Consumer Protection Act) to clearly identify the presence of any of the eight major food allergens (i.e., milk, egg, fish, Crustacean shellfish, peanut, tree nut, wheat, and soybeans) using their "common or usual name" on the label of foods.<sup>21</sup> Manufacturers must use words such as "milk" rather than the less familiar corresponding words such as "casein." If a product contains the milk-derived casein, the product's label would have to use the term "milk" in addition to the term "casein" so that people with milk allergies clearly understand the presence of an allergen they need to avoid.<sup>21</sup>

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