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## REVIEW ARTICLE

# Food consumption and nutritional adequacy in Brazilian children: a systematic review

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### KEYWORDS

Food consumption;  
Nutritional  
requirements;  
Infant nutrition;  
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### Abstract

**Objective:** To perform a review of studies of food consumption and nutritional adaptation in Brazilian infants pointing the main findings and limitations of these studies.

**Data source:** The articles were selected from Literatura Latino-Americana e do Caribe em Ciências da Saúde (Lilacs) (Latin-American and Caribbean Literature in Health Sciences), Scientific Electronic Library Online (SciELO) and Science Direct in Portuguese and in English. The descriptors were: “food consumption”, “nutritional requirements”, “infant nutrition” and “child”. The articles selected were read by two evaluators that decided upon their inclusion. The following were excluded: studies about children with pathologies; studies that approached only food practices or those adaptation of the food groups or the food offert; and studies that did not utilize the Dietary Reference Intakes (DRI).

**Data synthesis:** Were selected 16 studies published between 2003 and 2013. In the evaluation of the energy consumption, four studies presented energetic consumption above the individual necessities. The prevalence of micronutrients inadequacy ranged from 0.4% to 65% for iron, from 20% to 59.5% for vitamin A, from 20% to 99.4% for zinc, from 12.6% to 48.9% for calcium and from 9.6% 96.6% for vitamin C.

**Conclusions:** The food consumption of Brazilian infants is characterized by high frequencies of inadequacy of micronutrients consumption, mainly iron, vitamin A and zinc. These inadequacies do not exist only as deficiencies, but also as excesses, as noted for energetic consumption.

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**PALAVRAS-CHAVE**

Consumo alimentar;  
Necessidades  
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Nutrição do lactente;  
Nutrição da criança

**Consumo alimentar e adequação nutricional em crianças brasileiras: revisão sistemática****Resumo**

**Objetivo:** Fazer uma revisão de estudos sobre o consumo alimentar e adequação nutricional em crianças brasileiras e apontar os principais resultados e as principais limitações desses estudos.

**Fontes de dados:** Os artigos foram selecionados nas bases de dados da Literatura Latino-Americana e do Caribe em Ciências da Saúde (Lilacs), Scientific Electronic Library Online (SciELO) e Science Direct. Os descritores usados foram: “consumo alimentar” (*food consumption*), “necessidades nutricionais” (*nutritional requirements*), “nutrição do lactente” (*infant nutrition*) e “criança” (*child*). Os artigos selecionados nas bases de dados foram lidos por dois avaliadores que decidiram sobre a inclusão. Excluíram-se estudos de crianças com patologias; que abordavam apenas práticas alimentares; que analisaram adequação somente de grupos alimentares ou da alimentação oferecida; e os que não usaram as *Dietary Reference Intakes* (DRI). Buscaram-se artigos em português ou inglês e não se delimitou o período de busca.

**Síntese dos dados:** Selecionaram-se 16 estudos, publicados entre 2003 e 2013. Na avaliação do consumo de energia, quatro estudos mostraram consumo energético acima das necessidades individuais. A prevalência de inadequação de micronutrientes variou de 0,4% a 65% para o ferro, 20% a 59,5% para a vitamina A, 20% a 99,4% para o zinco, 12,6% a 48,9% para o cálcio e de 9,6% a 96,6% para a vitamina C.

**Conclusões:** O consumo alimentar de crianças brasileiras é marcado por frequências elevadas de inadequação no consumo de micronutrientes, sobretudo ferro, vitamina A e zinco. Essas inadequações não se apresentam apenas sob o aspecto da deficiência, mas também por meio de excessos, como observado para o consumo energético.

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**Introduction**

Children represent a group of highly vulnerable individuals, due to their rapid growth, physiological and immunological immaturity.<sup>1,2</sup> Adequate nutrition in the early years of life is essential for healthy growth and development.<sup>3</sup> Inadequate nutrient consumption can impair the nutritional status, leading to the development of nutritional deficiencies or excesses.<sup>4</sup>

Deficiency diseases increase children's susceptibility to diarrhea and infection and can compromise the maturation of the nervous, visual, mental and intellectual systems.<sup>5</sup> In Brazil, iron and vitamin A deficiencies are the most often observed micronutrient deficiencies, representing a public health problem.<sup>6,7</sup> Data from the National Demographic and Health Survey (PNDS), carried out in 2006, show a prevalence of anemia of 20.9% and inadequate levels of vitamin A in 17.4% of children younger than five years.<sup>8</sup>

With the nutritional transition, obesity and overweight, which reflect excessive energy consumption and / or insufficient energy expenditure, have shown a high prevalence in the Brazilian pediatric population. The Household Budget Survey (2008-2009) demonstrated the evolution of anthropometric indicators of Brazilian children aged five to nine years, showing an increase of overweight of 10.9% in 1974-1975 to 34.8% in 2008-2009 in boys and from 8.6% to 32% in girls, in the same period.<sup>9</sup>

Infant feeding practices should be able to provide enough food, with nutritional and sanitary quality, to meet the nutritional needs of children and ensure the development of their full potential.<sup>10</sup> Proper nutrition in childhood contributes to the establishment of healthy eating habits, which will have an impact not only in the short term, but also in adulthood.<sup>3</sup> Children with inadequate food intake since childhood tend to the early development of overweight and obesity, as well as other associated chronic diseases.<sup>11</sup> On the other hand, children submitted to optimal feeding practices reach their normal development and become healthier adults, with greater intellectual and productive capacity.<sup>12</sup>

Considering the importance of adequate dietary intake in childhood to reach the nutritional needs, this article aims to perform a systematic review of studies on food consumption and nutritional adequacy in Brazilian children, pointing out the main findings and limitations of these studies.

**Method**

This is a systematic review of the literature based on the analysis of studies related to food consumption and nutritional adequacy of Brazilian children. Articles were selected by searching the Latin American and Caribbean Literature

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