… just the FACTS

Study summaries examining the latest science on beef's place in a healthy diet

A 3 TO 1 ANIMAL-TO-PLANT PROTEIN RATIO IS NUTRITIONALLY OPTIMAL FOR CHILDREN

OBJECTIVE:

To examine the association between protein food sources and nutrient intake in Canadian children 9-18 years.

PARTICIPANTS:

This study included dietary recall data for 2,324 children 9-18 years of age (1,151 females and 1,173 males).

STUDY DESIGN:

24-hour dietary recall data from the 2015 Canadian Community Health Survey was used to assess the nutritional implications of varying animal-to-plant protein ratios in children's diets.

METHODS:

Participants were allocated to one of four groups based on the proportion of protein from plant sources in their diet. Average nutrient intakes were compared and assessed against the Recommended Dietary Allowances (RDA) and Adequate Intake (AI).

RESULTS:

Diet Groups:

	Group 1	Group 2	Group 3	Group 4
Proportion of protein from plant sources	0 - 24.9%	25 - 49.9%	50 - 74.9%	75 -100%
Percentage of children in each group	29.7%	53.6%	13.9%	2.7%

Nutrient Adequacy:

- A 3:1 animal-to-plant protein ratio (Group 2) aligns most closely with dietary recommendations.
  - Groups 1 and 2 met the RDAs and had a low risk of inadequacy for protein, iron, zinc, and B vitamins B_6, B_{12}, thiamine, riboflavin, and niacin.
  - Group 2 had the most favourable macronutrient profile.

Protein Intakes:

- Both the quantity and quality of protein consumed decreased with increasing plant protein intake.
  - On average, children derived 64% of protein from animal protein and 36% from plant protein sources.
  - Top sources of protein differed by group:
    - For Groups 1 and 2 - meat and dairy foods were the top two sources of protein.
    - For Group 4 (with >75% of protein from plant foods) - breads, rolls, crackers, grains, breakfast cereals, and dairy foods were the top sources of protein.

CONCLUSION:

This study suggests a diet with three times more animal protein than plant protein provides an optimal balance for Canadian children 9-18 years. The authors note:

- "A protein intake pattern characterized by a 3:1 ratio of animal-to-plant protein was associated with a favorable macronutrient distribution and adequate intakes of most essential nutrients."
- "Canadian children may be at risk of developing nutrient inadequacies when the majority of protein is derived from plant-based foods, particularly without attention to dietary diversity and nutrient density."

Fabek H, Salamat S, and Anderson GH. Association Between Dietary Protein Sources and Nutrient Intake in the Diet of Canadian Children. Nutrients 2025;17(11):1834.

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