

## Child hunger: semi-starvation study repeated in Canada

C. Laird Birmingham

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Starvation results from inadequate intake of macronutrients (proteins, fats and carbohydrates). It may be partial or complete. In fasting, all food energy is excluded, whereas in semi-starvation insufficient energy and protein are ingested. Human starvation and semi-starvation result from deprivation of food, not specific nutrients, so both micronutrient and macronutrient deficiencies result, causing clinical disease. The body defends against these deficiencies by triggering hunger, a cognitive state in which there is motivation to eat food.

Preliminary results of the long-term effects of semi-starvation were presented at the 9th International Congress on Eating Disorders, held in New York City on May 4–7, 2000.<sup>1</sup> Elke Eckert and Scott Crow presented details from the landmark study of Ancel Keys, carried out at the University of Minnesota in the 1930s, and a 50-year follow-up of most of the volunteers alive today. Keys wanted to establish the best way of refeeding people who had starved in Europe as a result of World War II. One hundred men volunteered for his study, in which the effects of a 24-week period of semi-starvation were examined. All of the men had been screened for exceptional physical and psychological health. Of the 40 chosen, 4 dropped out because they could not tolerate semi-starvation: 3 developed binge-eating, 2 began to steal food, 1 suffered severe depression, and 2 were admitted to hospital because of symptoms of psychosis. In the 50-year follow-up, abnormal eating behaviours (although less severe than those just described) and ruminations persisted in all of the 25 volunteers who consented to interview. Eckert and Crow concluded that the effects of hunger are powerful and long-lasting.

In this issue (page 961) Lynn McIntyre and colleagues review data from the 1994 National Longitudinal Survey of Children and Youth (NLSCY).<sup>2</sup> The data were collected from more than 13 000 families with children up to 11 years of age. Of these families, 206 (representing 57 000 Canadian families) reported that their children had experienced hunger because they had run out of food or money to buy food. The authors found that hunger was experienced most often in single-parent families, families that relied on social assistance and Aboriginal families living off-reserve.

Inadequate government assistance to poor people has resulted in what could be thought of as a naturalistic study. This “study” is too costly and will give no new data. Keys’ study of malnutrition already showed that people who un-

dergo semi-starvation will experience hunger, weakness, lack of drive, decreased ability to feel happiness, osteoporosis, hypoalbuminemia, dependent edema, decreased muscle mass, alopecia, hypotension, poor wound healing and depression.<sup>3</sup> “Children of hunger” will be less productive, will learn more slowly and are more likely to have behavioural problems.<sup>4–12</sup> Canadian health care costs will also be greatly increased owing to health problems, including complications during pregnancy and birth, in malnourished mothers who attempt to offset the hunger of their children by depriving themselves of food.

Ending the semi-starvation of Canadian children, a starvation that is implicitly endorsed by all Canadians who collectively have a mean income that is almost higher than any other country, will require a multilevel and multifaceted approach. Physicians and other health care professionals, the media, the education system, families and all levels of government must be involved.

First, *CMAJ*, in conjunction with television, radio and other media, should make public the NLSCY results as broadly as possible.

Second, the Canadian Neonatal and Pediatric Nutrition Network Workshop, which was held in Ottawa on June 17–19, 2000, and brought together health care professionals from across Canada to improve communication and cooperation in research, must continue to disseminate information about childhood malnutrition in Canada and extend this communication beyond their membership. Emails are already exchanged frequently across the nation.

Third, schools should offer subsidized breakfasts and lunches, to be supervised by parents and planned by registered dietitians. In the United States in 1996, \$4.4 billion of the \$39.8 billion targeted for food and nutrition programs went to support school lunch programs.<sup>13</sup>

Fourth, physicians must more carefully identify children suffering from inadequate diets and request monthly social assistance for food supplements in conjunction with a family dietary consultation. The purchase of nutritious foods on a limited income is nearly impossible, and physicians do not have enough time or training to provide adequate nutritional counselling. Because of these barriers, the help of dietetic associations should be sought.

By permitting children to go hungry, Canada is tacitly repeating Keys’ landmark study. This must be stopped. As individuals, we will be troubled when we read that Canadian

children are experiencing hunger. As physicians, we must be more suspicious of hunger and malnutrition in our patients. As a medical community, we must make our country aware of this tragedy and give specific advice for its remedy.

Dr. Birmingham is Director of the Division of Internal Medicine, St. Paul's Hospital, and Professor in the Department of Medicine, University of British Columbia, Vancouver, BC. He is also British Columbia Provincial Director of Eating Disorders.

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**Correspondence to:** Dr. C. Laird Birmingham, Director,  
Division of Internal Medicine, St. Paul's Hospital,  
1081 Burrard St., Vancouver BC V6Z 1Y6; fax 604 806-8338;  
clbirm@interchange.ubc.ca