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# **The Socio-demographic Determinants and Nutritional Consequences of Food Insecurity of a Group of New Zealand Children**

A thesis presented in partial fulfilment of the requirements for the degree of Masters of Science in Nutritional Science, at Massey University, Albany, New Zealand.

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**“When there is not enough money to buy food - our children have to go without eating.”**

Response of a caregiver to a child participating in the pilot study for the New Zealand Children's Nutrition Survey, 2000.

## **Abstract**

Food security among individuals exists when there is stable access to the kind of adequate, nutritious, safe, and culturally appropriate diet needed to maintain an active, healthy life (Campbell, 1991; Bickel et al., 2000). There is evidence that food insecurity – the lack of such an access - exists among some segments of the New Zealand population (Parnell, 1997; Russell et al., 1999; Parnell et al., 2001). There has been little research into the nutritional impact of food insecurity in New Zealand children.

The purpose of this study was to investigate the effects of socio-demographic and food security status on the nutrition and health of New Zealand children. The sample chosen for this study were a group of 183 children, aged one to 14 years, from Auckland's western suburbs, who participated in the Validation study; part of the pilot for the Children's Nutrition Survey conducted during 2000. Of the 183 children who participated in this study, 60 were Maori, 63 were Pacific and 60 were European.

Demographic, anthropometric and medical history data were obtained during interviews, and dietary data was based on 24-hour recalls and food frequency questionnaires. Statistical analysis, including two-sample t-tests, Kruskal-Wallis, ordinal and binary logistic regressions using the MINITAB 13.31 program (Minitab Inc., 2003), was performed on the data set. Any relationship was considered significant if the p-value was less than 0.05.

This study reported a high prevalence of food insecurity in the sample group, with 39% of all children living in households that sometimes or often did not have enough money to buy food. Household income, the educational status of the food preparer, the occupation of the main provider, the type of dwelling (rented versus owned) and ethnicity were significant predictors of food insecurity in the children in this study ( $p < 0.0005$ ).

Children from food-insecure households and children from low-income households, or children whose main provider was of a low occupational status or receiving a government benefit, or children whose food preparer left school early, or children from large-sized households living in rented homes, all had significantly lower intakes of fruit, vegetables, milk products and protein-rich foods such as meat. Food-insecure preschool children were also significantly more likely not to meet the RDI for nutrients such as vitamin E, calcium and selenium than food-secure preschool children. Most food-insecure school-age children did not meet the recommended values for energy, fibre, riboflavin, vitamin B6, folate, vitamin A and zinc. Poor dietary habits were observed amongst the food insecure, with most eating takeaways on a frequent basis.

Food insecurity was not significantly associated with overweight or obesity, or other measures of health status, in the group of children in this study. However, significantly higher BMI values were reported among food-insecure children, and Maori and Pacific children had higher BMI values than European or Other children. A stronger association was found between BMI and socio-economic status. Children living in low-income households or in rented dwellings, or whose food preparer left school at an early age, had higher median BMI values than children from higher income households or living in households where the home was owned, or whose food preparer had stayed at school for longer or had an undergraduate degree.

An important finding of this study was the high prevalence of food insecurity amongst Pacific children or children whose food preparer was of Pacific ethnicity. However, caution needs to be applied when drawing conclusions from this study, as the sample in the study was not a true representation of the New Zealand population. Some ethnic groups were under-represented, while households from the higher end of the income spectrum were over-represented in the sample chosen for the study. The results of this study are also subjective to limitations associated with the measurement of food insecurity (Blumberg & Bialostosky,

1999; Tarasuk & Beaton, 1999) and dietary assessment methods (Briefel et al., 1997; Gibson, 2002). There are also currently no nation-specific cut-off values for classifying NZ children as obese or overweight. The proposed Children's National Nutrition Survey will determine the prevalence of food insecurity in a random population based sample.

This study provides evidence that food insecurity and low socio-economic status can have a negative impact on the nutritional and health status of NZ children. Its findings provide a strong case for an increased public focus on the nutritional status of Pacific children. Future research is needed to assess the impact of nutritional education programs on food-insecure households with children.

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# **List of Abbreviations Used**

<b>Abbreviation</b>	<b>Full word (s)</b>
ABS	Australian Bureau of Statistics
ADA	American Dietetic Association
AI	Adequate Intake
BMI	Body Mass Index
CDS-PSID	Child Development Supplement of the Panel Study of Income Dynamics
CFSM	Core Food Security Measure
CNS	Children's Nutrition Survey
CPS	Census Bureau's Current Population Survey
CSFII	Continuing Survey of Food Intakes by Individuals
CWHS	California Women's Health Survey
DRI	Dietary Reference Intakes
EAR	Estimated Average Requirement
ECLS	Early Childhood Longitudinal Study
FFQ	Food Frequency Questionnaire
FNB	Food and Nutrition Board
LINZ89	1989 Life in New Zealand National Survey
MRC	Medical Research Council
MOH	Ministry of Health
NFCS	Nationwide Food Consumption Survey
NH	National Health
NHANES I, II, III	First, Second and Third National Health and Nutrition Examination Survey
NNS95	1995 Australian National Nutrition Survey
NNS97	1997 New Zealand National Nutrition Survey
NZ	New Zealand
NZDep96	NZ Deprivation Index 1996
NZSEI-96	NZ Socio-economic Index 1996
PSC	Pediatric Symptom Checklist
%	percent
RDA	Recommended Dietary Allowance
RDI	Recommended Dietary Intake
RNI	Recommended Nutrient Intake
SES	socio-economic status

<b>Abbreviation</b>	<b>Full word (s)</b>
UK	United Kingdom
UL	Tolerable Upper Intake Level
USA	United States of America
USDA	United States Department of Agriculture