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**A retrospective and cross-sectional study to evaluate the
effect of dietary acculturation on the dietary calcium
intake among Filipino women recently immigrated to
New Zealand**

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requirements for the degree of**

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Abstract

Filipinos in New Zealand have steadily grown in number over recent decades, and the majority undergo a dietary acculturation process, or the dietary adaptation of individuals in their host country. In the Philippines, the nutrient with the highest inadequacy in the diet is calcium, primarily contributed by fish and indigenous vegetables that are not readily available in New Zealand. The aim of this study is to determine the effect of dietary acculturation on the calcium intake of Filipino women recently immigrated to New Zealand and to explore the primary factors affecting their bone mineral status. Sixty-two (62) healthy pre-menopausal Filipino women (20–45 years old) were recruited. Current and previous dietary calcium intake, serum 25(OH)D (nmol/L) ($n=61$), physical activity data via an accelerometer, and bone mineral density (BMD) and body composition through dual-energy X-ray absorptiometry (DXA) were measured. Gross lean mass was calculated (total mass – [whole body total bone content + total fat mass]). Variables considered to be associated with bone mineral status were applied to a multiple regression analysis using the enter method. The median calcium intake for New Zealand [418 (260, 620) mg d⁻¹] after immigration was significantly lower than the intake in the Philippines [506 (358, 823) mg d⁻¹], $Z=-2.41$, $p=0.02$, medium effect size $r=0.22$. The significant predictor of bone mineral status among Filipino women was gross lean mass, whereas current and previous dietary calcium intake, physical activity and serum 25(OH)D were not found to be significant. However, a high prevalence (69%) of serum 25(OH)D <50nmol/L (mild–moderate deficiency) was detected. These findings illustrate the potential detrimental consequences of dietary acculturation on the essential nutrient intake of immigrants, but also provide an opportunity to correct previous dietary inadequacies by exposure to corresponding nutrient-dense foods from the host country.

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Abbreviations

25(OH)D	25-hydroxyvitamin D
ACC	Accident Compensation Corporation
ANOVA	analysis of variance
ANS	Adult Nutrition Survey
ATP	adenosine triphosphate
BMC	bone mineral content
BMD	bone mineral density
BMI	body mass index
C	Celsius
CT	computed tomography
CV	coefficient of variation
d ⁻¹	per day
DMPA	depot-medroxyprogesterone acetate
DXA	dual-energy X-ray absorptiometry
EAR	estimated average requirement
FFQ	food frequency questionnaire
FNRI	Food and Nutrition Research Institute
FHFFQ	Fred Hutchinson Food Frequency Questionnaire
g	gram
g/cm ²	gram per square centimetre
GP	general practitioner
IOM	Institute of Medicine
ID-LC-MS/MS	isotope-dilution liquid chromatography-tandem mass spectrometry
IU	International Unit
IU/day	International Unit per day
kcal/day	kilocalorie per day
kg	kilogram
kj	kilojoule
m	month
MYFCD	Malaysian Food Composition Database
mg	milligram
HNRU	Human Nutrition Research Unit
ml	millilitre
MOH	Ministry of Health
MSc	Master's of Science
n	number
ng/ml	nanogram per millilitre
NIST	National Institute for Standards and Technology
nmol/L	nanomole per litre
NZ	New Zealand
PBM	peak bone mass
PH	Philippines
PIXI	peripheral instantaneous X-ray imaging
PTH	parathyroid hormone
RDI	recommended dietary intake
RENI	recommended energy and nutrient intake
RNI	recommended nutrient intake

SD	standard deviation
NHANES	National Health and Nutrition Examination Survey
US	ultrasound
USDA	United States Department of Agriculture
UV	ultraviolet
UVB	ultraviolet beta radiation
VDR	vitamin D receptor
vs	versus
WHR	waist-to-hip ratio
WHO	World Health Organization
y	year
μg	microgram
μSv	microsieverts