#### SALT INTAKE AND SALT REDUCTION IN SECONDARY SCHOOL-AGE STUDENTS OF PRINCESS CHULABHORN'S COLLEGE CHIANGRAI (REGIONAL SCIENCE SCHOOL)

#### **WUTARAK PUENGPUTTHO**

A THESIS SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR
THE DEGREE OF MASTER OF SCIENCE (NUTRITION)
FACULTY OF GRADUATE STUDIES
MAHIDOL UNIVERSITY
2014

COPYRIGHT OF MAHIDOL UNIVERSITY

# Thesis entitled

### SALT INTAKE AND SALT REDUCTION IN SECONDARY SCHOOL-AGE STUDENTS OF PRINCESS CHULABHORN'S COLLEGE CHIANGRAI (REGIONAL SCIENCE SCHOOL)

	Miss Wutarak Puengputtho Candidate
	Assoc. Prof. Preeya Leelahagul, D.Sc. (Nutrition) Major advisor
	Mrs. Supiya Charoensiriwath, Ph.D. Co-advisor
	Miss Jintana Sirivarasai, Ph.D. Co-advisor
Prof. Banchong Mahaisavariya, M.D., Dip Thai Board of Orthopedics Dean	Assoc. Prof. Nalinee Chongviriyaphan, M.D., Ph.D. Program Director

Faculty of Graduate Studies

Mahidol University

Master of Science Program in Nutrition

Institute of Nutrition Mahidol University

Faculty of Medicine, Ramathibodi Hospital and

# Thesis entitled

### SALT INTAKE AND SALT REDUCTION IN SECONDARY SCHOOL-AGE STUDENTS OF PRINCESS CHULABHORN'S COLLEGE CHIANGRAI (REGIONAL SCIENCE SCHOOL)

was submitted to the Faculty of Graduate Studies, Mahidol University for the degree of Master of Science (Nutrition)

on July 24, 2014

	Miss Wutarak Puengputtho Candidate
Assoc. Prof. Preeya Leelahagul, D.Sc. (Nutrition) Member	Assist. Prof. Somsri Charoenkiatkul, D.Sc. (Nutrition) Chair
Assoc. Prof. Somjai Wichaidit, Ph.D. Member	Mrs. Supiya Charoensiriwath, Ph.D. Member
Miss Jintana Sirivarasai, Ph.D. Member	Assoc. Prof. Visith Chavasit, Ph.D. (Food Science) Director Institute of Nutrition Mahidol University
Prof. Banchong Mahaisavariya, M.D., Dip Thai Board of Orthopedics Dean Faculty of Graduate Studies Mahidol University	Prof. Winit Phuapradit, M.D., M.P.H. Dean Faculty of Medicine, Ramathibodi Hospital, Mahidol University

#### **ACKNOWLEDGEMENTS**

I am deeply grateful to Associate Professor Dr. Preeya Leelahagul, my major advisor for the opportunity given to me to research this valuable. I would like to express my very gratefulness to her for attentive support, advice, guidance and understanding throughout my study, that enable me to success.

I am very grateful to my co-advisors, Dr. Supiya Charoensiriwath and Dr. Jintana Sirivarasai for her kindness, suggestion and encouragement. I would also sincerely thanks Assistant Professor Dr. Somsri Charoenkiatkul, my chairperson and Associate Professor Dr. Somjai Wichaidit, my committee for their excellent advice and useful suggestions to greatly improve my thesis.

Sincere thank to Director Garan Janthranant, Mr. Kidja Klawiset, Miss Parcharee Kongpun, Miss Jemjira Promyot, Mr. Narupon Thongsuk, and all staffs of Princess Chulabhorn's College Chiang Rai (Regional Science School) for their cooperation and assistance to finish the research. Special thank extend to all students for their good participant, cooperation, nice, and friendly.

I would like to thank Mengrai Lab for sodium analysis during the study.

I am grateful to Mr. Kittichote Hoiyeephoo for his kindness, encouragement, concerned and excellent advice throughout my study.

I would like to thank my lovely friends and my beloved junior in medical science, Burapha University, including friends and senior in nutrition program, Mahidol University, for their assistance, console and encourage me until this thesis come to a perfect end.

Finally, I greatly appreciate to my family for all their love, warmth, care, encouragement, listen carefully and understanding always.