

Copyright is owned by the Author of the thesis. Permission is given for a copy to be downloaded by an individual for the purpose of research and private study only. The thesis may not be reproduced elsewhere without the permission of the Author.

**FORTIFIED FOODS WITH *SANGKAP PINOY* SEAL
and the MICRONUTRIENT INTAKE AMONG
SELECTED HOUSEHOLDS IN PUNTA, STA. ANA,
MANILA, PHILIPPINES**

**A thesis presented in partial fulfillment of the requirements for the
degree**

of Master of Science in Nutritional Science

Institute of Food, Nutrition and Human Health

Massey University

HELENA D. STA. INES

2001

Acknowledgment

To the Nutrition Service-Department of Health through Director Adelisa Cifra-Ramos and Ms. Erlinda Evora, I am very grateful for the opportunity and support you have given me.

I wish to express my gratitude to the New Zealand Government through the Ministry of Foreign Affairs and Trade Official Development Assistance for this scholarship.

I am most grateful to the patient guidance, unwavering support and encouragement of my supervisor Dr. Janet Weber. I wish to acknowledge how her advice, suggestions, ideas, constructive criticisms and over-all contributions made this thesis possible.

I also wish to express my gratitude to Dr. Duncan Hedderley for his advice not only to the statistical tests used but also for his valuable suggestions from the conceptualization up to the finalization of this research study.

In recognition of her valuable comments and effort in proofreading the draft of my thesis, I am thankful to Dr. Juliet Wiseman.

Special thanks go to Ms. Elizabeth Joven for serving as my second adviser during the initial stage and data collection period of my study and to Ms. Perla Castro for her valuable assistance not only during the data collection but also for providing the necessary materials I needed for this research and for taking care of everything while I was on study leave.

To Bing Banga, Girlie Infante, Marlyn Pagayunan and Ofelia Oseo, my appreciation for your assistance.

I owe a debt of gratitude to Ms. Myrna Lapuz of the National Capital Region (DOH) who helped me during the pre-testing and endorsed me to the Manila Health Department. Thank you very much to Dr. Ma. Paz Manrique and Dr. Sunico of Manila Health Department for their support in conducting my study in Punta, Sta. Ana, Manila.

I wish to appreciate the efforts of Dean Adela Jamorabo-Ruiz for editing the draft of the first three chapters of this thesis and Dr. Emilie Flores for her comments on the proposal.

I am very grateful for the support of Dr. Lena Mempin and the assistance of BHWs (Jun Cortez, Jr., Marilou Walo, Josefina Rivera, Leonida Firmeza and Charlie Rivera) and the volunteer health workers in all barangays of Punta, Sta. Ana, Manila.

To the Carambas and Baker families, thank you for providing me a “home away from home” during my stay here at Palmerston North, New Zealand.

My appreciation for the support and camaraderie of all my Filipino friends and co-students here at Massey University: Meggie, Raffy, Ruth and kids, Carmi, John, Gerome and Jang, Allan, Regina, Amy, Val, Ponchie, Mona, Pyone, Roy and Bing, Elvie and family, Mayet and kids, Ann, Sumi and Asif, Natilene, Erwin, Joe and family, Gladys, Veejay and to all my friends in the Philippines.

To the Institute of Food, Nutrition and Human Health of Massey University particularly Dr. Kathy Kitson, Ms. Patsy Watson, Ms. Heather McClean and all my lecturers for their support and guidance. Special mention and thanks also go to all the friendly staff of Massey University Library.

I wish to acknowledge the support and guidance of the International Students Office staff particularly Mr. Charles Chua in my stay at Massey University.

I am also very grateful to the cooperation and support of all the participants (comprising all the barangays of Punta, Sta. Ana, Manila) in my study without which this thesis could not be made possible.

Words can never be enough to express my gratitude to my parents for their love, support and encouragement all these years and to all my sisters, brothers and nieces and nephew for the inspiration. This thesis is a labor of love for all of you.

To my husband Ariel whose love and thoughtfulness sustained me all through the ups and downs of my post-graduate study and provided me with all the assistance I needed during the data collection and computation of nutrient analyses.

Above all, to Lord Jesus, my personal Savior my endless gratitude for everything particularly for sustaining me with wisdom and strength to go through all the difficulties in my study. Truly, all the glory goes to Him.

ABSTRACT

This study evaluated the food fortification program (*Sangkap Pinoy Seal Program-SPS*) in the Philippines in terms of determining the rate of awareness, attitude and considerations and the factors associated with purchase of fortified foods with SPS among women in a poor urban area in Manila. This study also determined the contribution of SPS foods to total iron and vitamin A intake of their preschool children. A survey was conducted through personal interviews among 134 mothers who were randomly selected from all villages of Punta, Sta. Ana, Manila.

Descriptive data showed that around 60% of the participants were aware of SPS foods. In general, a positive perception on SPS foods was demonstrated by the women as reflected in their comments. Majority of these comments associated SPS foods as foods accepted/recommended by the Department of Health, foods with added nutrients and nutritious and safe food to eat. Around 89% of those who were aware exhibited a positive attitude towards fortified foods. Awareness of fortified foods and foods with SPS were significant predictors of purchase of SPS foods. However, even if income was the stronger determinant of purchase than awareness, awareness still had some effect. Around 3% and 6% of the variation in purchase of SPS foods could be attributed to the effects of attitude to fortified foods and total opinion to food and health, respectively.

The results of this study also showed that preference of the family and taste were major considerations in purchasing SPS foods among more than half of the sample. These findings suggest that the participants purchased SPS foods not mainly because of added nutrients.

Intakes of energy and vitamin A among the respondents' preschooler children were considered adequate. However, their iron intake was found to be

less adequate. A remarkable finding of this research study was the significant contributions of SPS foods to iron and vitamin A intakes of the children in achieving the RDA. There was 53% increase on the number of children whose vitamin A intake was less than 50% of the RDA if SPS foods were taken out from the diet. SPS foods contributed around 27.6% to total vitamin A intake of the children. Without, the contribution of iron from SPS foods, there was 44% decrease on the number of children whose iron intake was greater than 75% of the RDA and 100% increase on the number of children whose iron intake was less than 50% of the RDA. Hence, iron and vitamin A from SPS foods did have an impact in the nutritional status of the children.

The findings of the study may provide vital information to the food fortification program and pose a challenge to nutrition educators. The results are discussed in relation to the previous literature and recommendations are presented with particular emphasis on the implications for future research. In conclusion, SPS foods may have a good potential to improve the nutritional status of the children.

TABLE OF CONTENTS

Acknowledgment	ii
Abstract	iv
Table of Contents	vi
List of Tables	x1
List of Figure	xiii
Chapter One Introduction	1
1.1 Background	1
1.1.1 Statement of the Problems	1
1.2 Significance of the Study	5
1.3 Objectives	7
1.3.1 General Objectives	7
1.3.2 Specific Objectives	7
1.4 Research Questions	8
Chapter Two Review of Related Literature	10
2.1 Energy and Micronutrient Intake of Filipino Preschoolers	10
2.2 Overview of Changing Patterns of Food Choice and Consumption Among Filipinos	12
2.3 <i>Sangkap Pinoy</i> Seal (SPS) Program Background Information	13
2.4 Filipino and International Studies on Efficacy of Fortified Food	16
2.4.1 Efficacy of Fortified Foods in the Philippines	16
2.4.2 Contribution of Fortified Foods in Nutrient Intakes	17
2.4.3 International Studies on Efficacy of Fortified Foods	20
2.4.4 International Studies on Fortified Foods in Free Living Individuals	22
2.4.5 The Effects of Nutrient Interaction/Risks of Fortified Foods	25
2.5 Consideration in Purchase and Intake of Fortified Foods	27
2.5.1 Do People Know About Fortified Foods	28
2.5.2 Attitudes Towards Fortified Foods in the Philippines	28
2.5.3 Who Uses Fortified Foods	29
2.5.4 Fortified Foods as a Food Choice Decision	31
2.5.4.1 Studies on Factors that Affect Food Choice	32
2.6 Relationship of Socio-Economic Factors to Food Choice and Intakes	34
2.6.1 Income	36
2.6.2 Food Budget	37
2.6.3 Household Size/Composition	38
2.6.4 Occupation	39
2.6.5 Educational Attainment	40
2.6.6 Advertising	41

2.6.7	Knowledge and Demographic Information	42
2.6.8	Use of Label in Purchasing Foods	43
2.7	Influence of Attitude to Healthy Diets	46
2.8	Demographics Associated with Attitudes/Reasons for Food Selection	47
2.9	Conclusion	48
2.10	Research Questions	50
Chapter Three Methodology		53
3.1	Introduction	53
3.2	Rationale for the Use of Methods	53
3.2.1	Quantitative Study	53
3.2.2	Selection of Research Methods	54
3.2.3	Diet Methodology	57
3.3	Location of the Study	59
3.3.1	Punta, Sta. Ana, Manila: A Brief Historical and Geographical Description	59
	Map of the Philippines	61
	Map of Manila	62
3.4	Sampling Method	63
3.5	Recruitment of Research Participants	64
3.6	Ethical Consideration	64
3.7	Questionnaire Design/Administration of Questionnaires	65
3.7.1	Section A. Awareness of Fortified Foods	65
3.7.2	Section B. Consideration for Purchase of Fortified Foods	65
3.7.3	Section C. Attitude	66
3.7.4	Section D. Demographics	68
3.7.5	24 Hour Recall	68
3.8	Pre-testing of Questionnaires	69
3.9	Data Collection Procedure	70
3.10	Data Analysis	70
3.10.1	Statistical Methods	74
3.10.1.1	Subproblem 1	75
3.10.1.2	Subproblem 2	76
3.10.1.3	Subproblem 3	76
3.10.1.4	Subproblem 4	77
3.11	Limitations of the Study	77
Chapter Four Results		79
4.1	Introduction	79
4.2	Participants	79
4.2.1	Profile of Participants	80
4.3	Relationship of Awareness, Attitude, Use of Label and Demographic Information with Purchase of Foods with SPS	82
4.3.1	Awareness	82
4.3.1.1	Understanding of Fortified Foods and Foods with SPS	83

4.3.1.2	Perception of Difference Between SPS Foods and Other Foods	85
4.3.1.3	Source of Information on <i>Sangkap Pinoy Seal</i> (SPS) Foods	86
4.3.2	Use of Food Labels	87
4.3.3	Purchase of SPS Foods and Association of Demographic Information	89
4.3.3.1	Purchase	89
4.3.3.2	Relationship of Purchase with Demographic Information	89
4.3.4	Relationship of Awareness and Purchase	92
4.3.4.1	Awareness of Fortified Foods	92
4.3.4.2	Relationship of SPS Awareness and Purchase	93
4.3.5	Attitude to Fortified Foods	96
4.3.5.1	Relationship of Demographic Variables to Attitude to Fortified Foods	97
4.3.5.2	Attitude and Purchase	97
4.3.5.3	Effect of Demographic Variables on the Relationship Between Purchase and Attitude to Fortified Foods	98
4.3.6	Purchase and General Opinion on Food and Health	99
4.3.6.1	Relationship of Purchase to Awareness of Fortified Food and SPS Foods Controlling for Family Size and General Opinion	101
4.4	Considerations in Purchasing Foods with SPS	101
4.5	Nutrient Intake of Preschoolers	103
4.5.1	Energy Intake	104
4.5.2	Vitamin A Intake	104
4.5.3	Iron Intake	106
4.5.4	Relationship of Energy and Nutrient Intake with Demographic Variables	106
4.5.4.1	Average Energy Intake	106
4.5.4.2	Average Vitamin A Intake	107
4.5.4.3	Average Iron Intake	107
4.5.5	Purchase and Intake	109
4.6	Percentage Contribution of SPS Foods on Vitamin A and Iron Intakes	109
4.6.1	Vitamin A Intake from SPS Foods	110
4.6.2	Iron Intake from SPS Foods	111
4.6.3	Effect of Removing SPS Foods from the Diet	112
4.6.3.1	Relationship of SPS Foods to Meeting RDA of Vitamin A with and without SPS Foods	112
4.6.3.2	Cross Tabulation of Percentage Adequacy of Iron with and without SPS Foods	112
4.6.4	Effect of Removing the Contribution of SPS Foods on Percentage RDA	113
4.6.5	Intake of Foods with SPS	115
4.6.5.1	Relationship of Vitamin A from SPS Foods with Demographics	115
4.6.5.2	Iron from SPS Foods	116

4.7 Summary	117
Chapter Five Discussion	118
5.1 Introduction	118
5.2 Rate of Awareness of Fortified Foods or SPS Foods and Demographic Characteristics	118
5.2.1 Rate of Awareness	119
5.2.1.1 Understanding of Fortified Foods and Foods with SP	120
5.2.1.2 Use of Label and Demographic Information	122
5.3 Relationships of Awareness, Attitude, Use of Label and Demographic Information with Purchase of Fortified Foods	123
5.3.1 Predictors of Purchase: Demographic Information and Use of Label	123
5.3.2 Relationship of Awareness with Purchase and the Effect of Demographic Variables	125
5.3.3 Attitude to Fortified Foods, Demographic Variables and Purchase	127
5.3.3.1 Attitude to Fortified Foods, Demographic Variables and Purchase	127
5.3.3.2 Relationship between Attitude and Purchase and the Effect of Demographic Information	129
5.3.4 Relationship of General Opinion, Attitude and Demographic Variables to Purchase	130
5.3.4.1 Attitude to Fortified Foods and General Opinion to Food and Health	130
5.3.4.2 Relationship of Purchase with General Opinion and the Effect of Demographic Information and Awareness	131
5.4 Considerations in Purchasing Foods with SPS	134
5.5 The Contribution of SPS Foods to Total Nutrient Intakes	136
5.5.1 Intake of SPS Foods Among Preschoolers	136
5.5.1.1 Energy Intake	136
5.5.2 Vitamin A Intake and Contribution of SPS Foods	138
5.5.2.1 Vitamin A Intake	138
5.5.2.2 Contribution of SPS Foods to Total Vitamin A Intake	140
5.5.2.3 Vitamin A Intake and Purchase	140
5.5.3 Iron Intakes and Contribution of SPS Foods	141
5.5.3.1 Iron Intake	141
5.5.3.2 Contribution of SPS Foods to Total Iron Intakes	143
5.5.3.3 Vitamin A and Iron from SPS Foods and Demographic Information	145
5.6 Summary	149

Chapter Six	Conclusion and Recommendation	150
6.1	Conclusions	150
6.2	Implications/Recommendations	156
Bibliography		159
Appendices		178
Appendix 3-1	Information Sheet (English Version)	178
	Information Sheet (Filipino Version)	179
Appendix 3-2	Informed Consent (English and Filipino Version)	180
Appendix 3-3	Questionnaires (English Version)	181
Appendix 3-4	24 Hour Recall (English Version)	190
	24 Hour Recall (Filipino Version)	191
Appendix 4-1	Recommended Dietary Allowance for Iron and Vitamin A For Filipino Preschool Children (FNRI, 1989)	192
Appendix 4-2	List of SPS Foods and Fortificants	193
Appendix 5-1	Samples of Advertisement of SPS Foods in Print	194

List of Tables

Table 3.1	Advantages of interview surveys specific to the present study	55
Table 3.2	Advantages and disadvantages of open-ended and closed-ended questions	56
Table 3.3	Statements on three aspects of attitude	67
Table 3.4	Statistical methods used to measure variable	76
Table 4.1	Characteristics of Participants	81
Table 4.2	Understanding of the term “fortified foods	84
Table 4.3	Understanding of the meaning of SPS foods by those who were aware of the term	85
Table 4.4	Perception of the difference between SPS foods and other foods by those who were aware of SPS foods	86
Table 4.5	Information sought at food labels	87
Table 4.6	Percent of respondents using food labels by educational status	88
Table 4.7	Predictors of the reported purchase of SPS foods in a week if the effect of family is controlled	91
Table 4.8	Mean purchase of respondents by income categories	91
Table 4.9	Mean purchase of respondents by employment status	91
Table 4.10	Mean purchase of respondents based on the frequency of use of label	92
Table 4.11	Interaction between SPS awareness and age	94
Table 4.12	Interaction between SPS awareness and respondents’ employment status	95
Table 4.13	Interaction between use of label and SPS awareness	95

Table 4.13	Interaction between use of label and SPS awareness	95
Table 4.14	Effect of demographic variables on the relationship between purchase and attitude towards fortified foods	99
Table 4.15	Percentage of respondents who mentioned the top three reasons for purchasing all SPS foods	102
Table 4.16	Percentage of respondents who did not mention each reason for purchasing any SPS food	103
Table 4.17	Average iron intake of the children belonging to different income levels	108
Table 4.18	Cross tabulation of % adequacy on vitamin A intake and intake of vitamin A from SPS food	112
Table 4.19	Cross tabulation of % adequacy on iron intake with or without SPS foods	113
Table 4.20	Comparison of percentage RDA for vitamin A among children with and without the vitamin A contribution from SPS foods	113
Table 4.21	Comparison of percentage adequacy with and without the amount of iron contributed by SPS foods	115

List of Figures

Figure 2.1	Some factors affecting food choice and intake	31
Figure 2.2	Conceptual Framework	35
Figure 4.1	Distribution of respondents' scores on attitude to fortified foods	96
Figure 4.2	Graph showing the correlation between purchase and attitude in different educational backgrounds	98
Figure 4.3	Graph showing the correlation between attitude and general opinion	100
Figure 4.4	% of children's energy intake in different adequacy levels based on % RDA	104
Figure 4.5	3-day average vitamin A intakes (ug/day) of respondents' preschool children	105
Figure 4.6	Adequacy of iron intakes of the respondents' children based on % RDA	106
Figure 4.7	% of children having vitamin A (in ug) from SPS foods	111
Figure 4.8	Comparison of % RDA on vitamin A intake of the children with or without SPS foods	114
Figure 4.9	Comparison of % RDA of iron intake of the children with and without SPS foods	115

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

Micronutrient malnutrition is a potential threat to the health and productivity of more than 2 billion people around the world but it can be largely prevented (Darnton-Hill, et al., 1999). The Philippines, just like any Third World country suffers from primary malnutrition problems. The 1998 National Nutrition Survey shows the continued existence of vitamin A deficiency, anemia and goiter among vulnerable groups particularly among pre-school (Madriaga, et al., 1998). These deficiencies have serious consequences for both mental and physical health.

1.1.1 Statement of the Problems

Malnutrition is a significant public health problem in the Philippines. The most affected groups are preschoolers, pregnant and lactating women. According to Florencio (1989), malnutrition affects growth and development, productivity, reproductive ability, resistance to disease and learning ability. The prevalence of night blindness and Bitot's spots among children 6 months to 6 years was 0.4% and 0.1% respectively. Translating these figures, approximately 3.5% of the estimated 11 million Filipino pre-school children have xerophthalmia, 10% of which are corneal related cases. Even worse, 50% of those with corneal damage become blind, 70% of them may die a few months after becoming blind (De Guzman, et al., 1996). Around 6.9% of the population 7 years and older have goiter, a manifestation of iodine deficiency. About 28.9% of the population was found to be affected by iron deficiency anemia. The most affected groups were infants aged 6 months to 1 year old with a prevalence rate of 49.2%, followed by

the elderly (45.6%), then by the pregnant women (43.6%) and lactating women (43%) (FNRI, 1993). Recently, the 1998 National Nutrition Survey showed 8.2% and 29.6% prevalence rates for vitamin A deficiency and anemia, respectively among children 6 months to 5 years old (Madriaga, et al., 1999).

Micronutrient supplementation, nutrition education and food fortification are major interventions being implemented to reduce micronutrient malnutrition in the Philippines. Food fortification is the addition of a micronutrient deficient in the diet to commonly consumed food or seasoning. To be successful, the quality must be maintained or improved without the quantity of food eaten being increased (De Guzman, et al., 1996).

Fortification of widely consumed foods, particularly staples, such as rice, sugar and flour-based products is a major intervention program under the Philippine Plan of Action for Nutrition (Joven, et al., 1996). Generally, it is recognized as the most effective, sustainable and long-term intervention to eliminate micronutrient deficiencies (NNC, 1995). Since the nutrients are added to commonly consumed foods, food fortification does not require changes in food habits and it can reach much of the target population at low cost (NNC, 1995).

Food fortification in the Philippines dates back to 1948 when the use of enriched rice significantly reduced mortality due to beriberi by 67% (Claudio, et al., 1982). The early 1950's saw the passage of Rice Enrichment Law, which required the addition of thiamin, niacin and iron to ordinary rice during the milling process (Corpuz, 1986). During its initial implementation, it was reported that prior to cooking, several housewives removed and discarded fortified artificial rice grains due to its yellowish color from added thiamin and riboflavin (Latham, 1997). Unfortunately, operational and political problems hampered its full implementation and thus rice enrichment died a natural death (Florentino and Pedro, 1998).

The 1980's saw renewed interest in the fortification of rice. The Food and Nutrition Research Institute (FNRI) modified and adapted the technology using ferrous sulphate as the fortificant. In 1994, efforts were exerted to establish the technical, organizational, and legal foundation to operationalize a food fortification program in the country (NNC, 1995). A pilot program to test the feasibility of marketing and distributing rice fortified with iron was run in Nueva Ecija. It was called Fortified Vitamin Rice (FVR) Program. The Nutrition Service-Department of Health along with other national agencies initiated this project. The FNRI carried out the fortification and a local cooperative in the area was responsible for marketing and distributing the iron-fortified rice to households in pilot municipalities. Despite government support, this program has not proceeded as expected, perhaps due to technical problems with discoloration, the multitude of rice mills and a lack of illustrated success in a pilot trial (Darnton-Hill, 1998). Along with rice fortification, iodization of salt has been a major effort in eliminating iodine deficiency disorders in this country since the early 90's. Still, iodine deficiency is prevalent. At present, efforts in fortification of bread resulted in the introduction of fortified bread in selected bakeries in Manila. Since fortification of staple foods has not been widely implemented nationwide, fortification of processed foods has been introduced as another measure of the food fortification program to eliminate micronutrient malnutrition in the Philippines.

An initial attempt at fortification of processed food product in the Philippines was the fortification of the flavor enhancer monosodium glutamate (MSG) with vitamin A in 1973 (Solon, et al., 1985). MSG was widely consumed with an average intake of 2.4 grams per day. Problems with the quality of the product and the fortificant during packaging and distribution were encountered. Nevertheless, MSG fortification resulted in the improvement of vitamin A status among the sample population within a short period of time. However, nationwide implementation of MSG fortification did not proceed due to a variety of technical, political and food industry reservations (Bloem, et al., 1998).

The *Sangkap Pinoy* Seal Program (SPSP) has been developed to encourage food manufacturers to market high quality fortified food products with essential micronutrients. It was first implemented in 1994. Its thrust is public and private sector collaboration. The program encourages the food manufacturers to fortify their food products with only vitamin A, iron and iodine-the nutrients commonly inadequate in the Filipino diet. *Sangkap Pinoy* (SP) is the DOH adopted term for the micronutrients needed by the body for mental, physical and emotional development. These nutrients are Vitamin A, iron and iodine. The *Sangkap Pinoy* Seal (SPS) is envisioned to be a prestigious sign to be awarded to food manufacturers after meeting the standards for fortifying products with vitamin A, iron, or iodine. With this seal, it is hoped that the general public will be more aware of the availability and benefits of fortified foods and thus be encouraged to consume such products (NNC, 1995). Marketing of fortified foods with the seal has been the responsibility of food manufacturers themselves. However, the Department of Health is responsible for a promotional campaign to generate public awareness of the availability and the nutritional benefits of SPS foods.

At present, products from 18 food manufacturers fortified with vitamin A, iron or iodine carry the SPS. Among approximately a hundred fortified foods, which have proliferated in the Philippine market, only 25 them have been granted the *Sangkap Pinoy* Seal (NS-DOH, 1999). These foods are referred to as SPS foods or foods with SPS. Manufacturers of the other food products claiming to be fortified foods have applied for SPS but were not able to meet the standards; or have been waiting for the evaluation of their application; still, others have not applied for the seal at all. The fortified foods with the seal of acceptance include basic commodities such as noodles, sardines, cooking oil, and less commonly consumed foods such as infant cereals, orange juice, margarine, cheese, hotdog, chips chocolate drink, mixed flour, catsup, crackers, milk, sandwich spread and other snack foods.

In order for the SPS program to be effective, the segment of the population lacking or in need of these micronutrients must consume the fortified foods.

Only a few studies have looked at the characteristics of consumers in relation to purchase and consumption of fortified foods. In the Philippines, results of a qualitative study conducted among mothers showed that good nutrition was recognized as important and respondents were willing to buy fortified foods (Joven, et al., 1996). However, the term fortification was not well understood and there were concerns about the possible change in color, texture, taste and odor of fortified bread. It was shown that fortified foods were generally perceived as more expensive than non-fortified foods and mothers who were willing to buy these foods were perceived as only those who could afford more expensive foods. A similar study on perceptions of fortified foods in the Philippines demonstrated the limited knowledge and exposure to fortified foods among respondents (NS-DOH and Moran, 1996).

1.2 SIGNIFICANCE OF THE STUDY

The *Sangkap Pinoy Seal Program* has now been running for six years and only in the past three years have a good variety of foods been available in the market.

Now is a good time to evaluate the present *Sangkap Pinoy Seal Program* by examining the rate of awareness of SPS foods after several years of continued promotion. This study will also examine the considerations that affect the purchase and use of SPS foods and the contribution of SPS foods to the micronutrient intake in the diet.

This proposed research will be carried out in all barangays (villages) in Punta, Sta. Ana, Manila through personal interviews among women with preschool children. These women and their children are most likely to have deficient nutrient intakes, and hence use of foods with SPS will be beneficial. The findings of this study will provide valuable information to assist nutrition educators in encouraging the use of SPS foods. It may also suggest changes to SPS foods to increase acceptance. Knowing the characteristics of people who are

aware and not aware of fortified foods may help the program implementor to identify people who are likely or unlikely to consume fortified foods. In addition, the results of this study might serve as basis for legislation for fortification of staple foods since there is a pending bill for fortification of processed foods in Congress. Alternatively, if a high rate of awareness and interest to foods with SPS among the respondents is found, it may stimulate the food manufacturers to apply for the seal and ensure good quality fortification. Improved products could lead to increased use and hence, decrease micronutrient deficiencies. It is expected that the barriers to purchasing fortified foods could be unfavorable attitude, unawareness, and perception of high price. It is believed that all this information may be useful and relevant to nutrition educators not only in the advocacy of SPS foods but also for a more successful implementation of *Sangkap Pinoy Seal Program*.

As far as the researcher knows, this study is the first local research to determine the micronutrient contribution of SPS foods among the consumers. This information is expected to be useful in the fortification program since this will measure the effect of fortified foods with SPS on iron and vitamin A intakes of the Filipino preschool children.

The review of literature shows that the relationship of socio-economic factors to food choice and nutrient intakes is significant. It is important to determine their effects on the purchase and intake of SPS foods. It is postulated that socio-economic factors as well as attitude towards food selection and awareness of SPS foods will exert a significant effect on the consumption of SPS. The proposed study aims to identify the socio-demographic factors that are associated with purchase and intake of SPS foods. Knowing these factors may assist nutrition educators in their advocacy of SPS foods.

Food choice is a complex process and is influenced by a number of factors. It is assumed that the factors that influence purchase of SPS foods will be similar to the factors that affect food choice. People do not necessarily make a conscious

decision to purchase fortified foods or foods with SPS. If a particular food (fortified or not) meets their choice criteria it is likely that they will purchase it.

It is hoped that advocacy campaign on SPS foods will increase awareness and lead to purchase of these foods. Purchase of SPS foods may be influenced by a number of factors. The attributes of foods such as quality and nutritional content could affect purchase of SPS foods. It is postulated that attitude might influence purchase of these foods. Attitude is influenced by perceptions of attributes e.g. price, taste, quality, nutrient (cognitive), general attitude and feelings towards fortified foods (affective), and expected action e.g. purchase or reject fortified foods, as a result of these perceptions (conative). An individual's purchase of SPS foods will also depend on social and economic aspects such as income, size of the family, preference of the family and advertising. Beliefs and opinions on foods and health might also exert an influence on purchase of these foods. It is assumed that purchase of SPS foods would be different from purchase of other foods.

1.3 OBJECTIVES

1.3.1 General Objective:

To determine awareness and how it is related to purchase of SPS foods and relate the level of SPS fortified food consumption to the micronutrient intake of preschool children in a selected area in Manila.

1.3.2 Specific Objectives:

1. To determine the rate of awareness and attitudes towards fortified foods and foods with SPS among mothers with preschool children and describe their relationship with demographic characteristics.
2. To determine the relationship of awareness, attitude, use of label and describe demographic information with purchase of foods with SPS.
3. To determine considerations in purchasing foods with SPS for mothers with preschool children.

4. To determine the nutrient intake of iron and vitamin A of preschool children through the use of three 24-hour recall and calculate the contribution of foods with SPS consumed to micronutrient intake.

1.4 RESEARCH QUESTIONS

In the light of these objectives, the proposed research aims to answer the following research questions:

Are people aware of fortified foods or SPS foods and what are the characteristics of people who are aware or not aware? Knowing the rate of awareness of fortified foods in general and SPS foods in particular, will enable nutrition educators to evaluate their efforts in disseminating information on SPS foods. Determining the characteristics of people associated with awareness of fortified foods with SPS will help the nutrition educators in their advocacy.

Does attitude relate to demographic characteristics? Identifying the characteristics of people with positive or negative attitude to fortified foods might be useful for a more effective implementation of the food fortification program.

What is the relationship of awareness, use of label, attitude, general opinion on food and health and demographic factors with purchase of SPS fortified foods? Nutrition educators need this information for more effective advocacy of SPS foods and to ensure a more efficient implementation of the program.

How much is the contribution of SPS foods to total nutrient intakes? Will this contribution be significant enough to affect the level of adequacy for these nutrients? This information will be relevant to evaluate the SPS program.

What are the considerations that influence the purchase of SPS foods? Determining the factors that influence consumers' purchase of SPS foods will help in improving the quality and acceptance of these foods to the public.

This chapter provides the background information on the situation and introduces the need for a local research study on SPS foods and highlights the significance of the research.

Chapter two will explore in detail the relevant literature on food choice, micronutrient intake and use of fortified foods from both Philippine and international sources. Since an integral part of this study is determination of micronutrient intake of preschoolers, a brief background on the energy and nutrient intake of the local population, particularly the preschoolers, will be covered. Previous local and international studies on fortified foods are included in relation to the present study.

Chapter three describes the methods used and chapter four presents the results and analysis of the data collected including presentation of tables and illustration of figures.

Chapter five discusses the results in detail in relation to the objectives of this study and the previous literature. It also includes the limitations of the study.

The last chapter presents the conclusions, implications and recommendations of the research.