



Rural families use of herbs and/or health foods: a descriptive study
by Laura Lee Phillips

A thesis submitted in partial fulfillment of the requirements for the degree of MASTER OF NURSING
Montana State University

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Abstract:

To identify what herbs and/or health foods farm-ranch family members are using for preventive or therapeutic health care was the purpose of the study. The conceptual scheme primarily utilized Rogers (1980) theory of nursing, "unitary man and environment," as a central, holistic, and humanistic nursing approach for individuals who use nutritional measures for health care.

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Data analysis revealed the following: the major informants were middle class, were between 27 and 87 years of age (average age 55 years), had at least a high school education, were married, had families, and were active in some part of the farm-ranch industry.

All informants primarily used fresh, home grown, chemically untreated food products. All informants used some nutrient supplement, and most preparations had high potency contents. Some informants took dosages of nutrients considered to be toxic by scientists. Herbs (106 different herbs) were used for medicinal purposes for their diuretic, cathartic, sedative, and aromatic effects. Thyroid and high blood pressure medications were the most frequently taken drugs for diagnosed conditions. All informants reported they felt better because of their more natural diets, their nutrient supplementation, and/or their herb use for health care.

Implications for nursing included the need for assessment tools that ask for more specific questions about the use of foods, supplemental vitamins and minerals, and herbs as natural medicines. Need for further study was indicated concerning the following questions: (a) What do nurses need to know about the long term effects of high potency nutrient intake? (b) How can nurses better assess the nutrition, nutrient supplementation, and herb health care practices of their clients? (c) What measures can nurses use to assist clients in preventing toxicity or the interaction effects of herbs, health foods, and nutrients used?

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May 27, 1982

RURAL FAMILIES' USE OF HERBS AND/OR HEALTH FOODS:

A DESCRIPTIVE STUDY

by

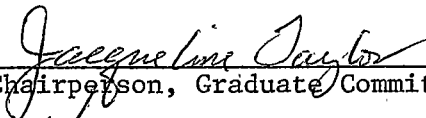
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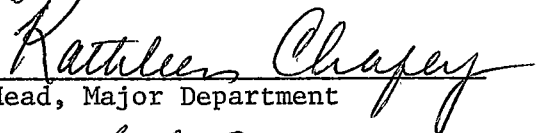
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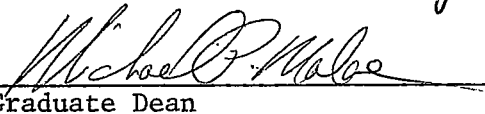
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"Every individual has a place to fill in this world, and is important in some respect whether he chooses to be or not."--Nathaniel Hawthorne.

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TABLE OF CONTENTS

Chapter		Page
	Vita.	ii
	Acknowledgements.	iii
	Table of Contents	iv
	List of Tables.	viii
	Abstract.	ix
1	INTRODUCTION.	1
	Introduction: Background and Rationale for the Study	1
	Statement of the Problem.	2
	Purpose of the Study.	4
	Summary	4
	Definition of Terms	6
2	LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK.	9
	Conceptual Framework.	9
	Nutrition, Health Foods, and Herbs for Health	13
	Nutrition	13
	Food Used for Health.	16
	Vitamin-Mineral Supplementation	19
	Megavitamin Therapy	20
	Vitamin A	21
	Vitamin E	22
	B Vitamins.	24
	Vitamin C	26
	Vitamin C and Colds	27
	Vitamin C and Cancer.	29
	Vitamin C and Heart Disease	32
	An Observer's View of Vitamin C	32
	Minerals.	36
	Consideration of Differences in Tolerance	37
	Herbs	38
	Preventive Health	45
	The Placebo Effect.	47
	Summary	49

TABLE OF CONTENTS (cont'd)

Chapter		Page
3	METHODOLOGY	50
	Selecting the Sample.	51
	Procedure	54
	Protection of Human Rights.	59
	Data Analysis	60
4	DATA ANALYSIS	61
	Part I: Rural Family Use of Herbs and/or Health Foods	61
	Background, Environmental, and Demographic Information	62
	Description of the Sample	66
	Farm-Ranch Wives: Roles, Activities, Nutrition Practices	68
	Part II: Rural Family Use of Herbs and/or Health Foods	76
	General Information: Vitamins and Minerals	77
	Supplemental Nutrient Use by Rural Family Members	79
	Use of Water Soluble Vitamins	81
	Vitamin B ₁	81
	Vitamin B ₂	82
	Vitamin B ₅	83
	Vitamin B ₆	84
	Vitamin B ₉	85
	Vitamin B ₁₂	85
	Vitamin C	86
	Other Water Soluble Vitamins.	88
	Pantothenic Acid.	88
	Para-Aminobenzoic Acid.	88
	Biotin.	89
	The Pseudo-Vitamins	89
	Inositol.	89
	Choline	90
	Fat Soluble Vitamins.	91
	Vitamin A	91
	Vitamin D	93

TABLE OF CONTENTS (cont'd)

Chapter		Page
4	Vitamin E	94
	Vitamin K	95
	Major Minerals.	96
	Calcium	96
	Phosphorus.	98
	Magnesium	100
	Potassium	101
	Trace Minerals Used By Participants	103
	Iron.	103
	Manganese	105
	Copper.	105
	Iodine.	107
	Selenium.	108
	Zinc.	108
	Herbs Used for Preventive and/or Therapeutic	
	Health.	109
	Rural Family Member Use of Herbs.	110
	Alfalfa	113
	Aloe.	114
	Camomile.	116
	Cayenne.	117
	Catnip.	118
	Comfrey	119
	Garlic.	120
	Golden Seal	121
	Ginseng	123
	Lobelia	125
	Mint.	127
	Parsley	128
	Raspberry	130
	Rhubarb Root.	131
	Herb and Health Food Costs to Rural Families.	132
	Diagnosed Illnesses and Prescribed Drugs.	132
	Informants' Sources for Drugs, Nutrients, and Herbs	134
	Reasons for Herb and/or Health Food Use	137
	Hutterite Herb and/or Health Food Use	139

TABLE OF CONTENTS (cont'd)

Chapter		Page
5	SUMMARY AND CONCLUSIONS	144
	Conclusions	151
	Implications and Limitations.	156
	APPENDICES.	161
	Appendix A.	162
	Appendix B.	164
	Appendix C.	165
	Appendix D.	168
	Appendix E.	169
	Appendix F.	170
	Appendix G.	172
	BIBLIOGRAPHY.	174

LIST OF TABLES

Table		Page
1	Rural Family Member Vitamin Use	162
2	Rural Family Member Mineral Use	163

ABSTRACT

To identify what herbs and/or health foods farm-ranch family members are using for preventive or therapeutic health care was the purpose of the study. The conceptual scheme primarily utilized Rogers' (1980) theory of nursing, "unitary man and environment," as a central, holistic, and humanistic nursing approach for individuals who use nutritional measures for health care.

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Chapter 1

INTRODUCTION

Introduction: Background and Rationale for the Study

The goals of nursing have traditionally been directed toward the maintenance and promotion of health, the prevention of illness, and the care and rehabilitation of the sick and disabled. Nurses have been dealing with people as whole and unique individuals since the Florence Nightengale era.

At the present time, due to some changes that affect man and the environment in this society, there is an emphasis being placed on nutrition, health, and preventive health care by all the health professions. The emphasis on nutrition and preventive health care has risen from a variety of influencing factors. These factors were addressed by Cousins and Pelletier in the introduction and body of the book, Holistic Medicine From Stress to Optimum Health (Pelletier, 1980). Some of the factors addressed related directly to nutrition. More research is being done in the area of nutrition as a health resource. In 1977, the Senate Select Committee on Nutrition issued six United States Dietary Goals (Pelletier, 1980), and in 1980, the Department of Health and Human Services published "Dietary Guidelines of Americans" (Heyn, 1981). There is skepticism of physicians' nutrition expertise (Pelletier 1980). It is the intention of this

study to deal with one of these factor areas, namely, research in the area of nutrition. This study is concerned with nutrition in relation to preventive or therapeutic health care.

Statement of the Problem

Today's public is aware of and receptive to matters concerning health and nutrition. Nutrition has been used as a vehicle to reach the goal of health since the ancient civilizations. The field of nutrition has not been without its own change processes. At present it is vulnerable to distortions, fads, and cults. Dietary supplements termed "health foods," "organic foods," and "natural foods" are being used to seek the nebulous goal of health.

During a health survey of a rural community carried out to meet graduate course requirements (1980) it was found that "feeling good" was how rural persons defined health. It was also found that the rural family members were using herbs and health foods for preventive and/or therapeutic health care. Some of these people were using high dosages of vitamins and minerals. Concern arose over the possibility of side effects of excessive dosages of the nutrients, about the interactions of herbs and health foods with prescribed drugs, and about the alterations of diagnostic test results, when confirmed herb and/or health food users are served by formal health care providers. This concern led to the exploratory question about the implications

for nursing when herbs and/or health foods are used for preventive or therapeutic health care.

To serve a public that is using herbs and health foods to maintain health and prevent illnesses, nurses should be knowledgeable about aspects of herb and health food practices. Scientific information about the consequences of ingestion of herbs and health foods is not readily available, but general information about excess dosages or deficiencies of nutrients are known. However, the areas of food and drug interactions requires further research. The lack of knowledge about herb and health food practices and consequences creates a problem in the delivery of holistic health care.

One method used to learn about unknown practices is to do an exploratory study. By questioning confirmed herb and/or health food users about what substances and practices they are using, and by observing them in their environments, nurses can learn what further assessment is needed to prevent or discover potential drug interactions. This study begins to explore what herbs and/or health foods are being used by a rural population. An ethnographic field study approach was used to elicit descriptions of what herbs and/or health foods were used, and of characteristics of the rural herbs and/or health food users. The study began by asking the question "What herbs and/or health foods are rural families using for preventive or therapeutic health care?"

Purpose of the Study

The purpose of the study was to determine what herbs and/or health foods rural family members are using as preventive or therapeutic health care measures. More specific knowledge about what nutritional practices are being used by rural families will help health professionals to anticipate potential problems such as drug interactions, and gain insight into planning care for confirmed health food users.

To provide holistic care for rural health care consumers, health care providers are challenged to integrate knowledge about foods, nutrition, and drug practices with what is known about health and illness. Armed with this information they then can assist the consumer in selecting safer nutrition and health practices. This approach to nutritional health care encouraged development of potential for optimal health and the enjoyment of food substances while preventing disease.

Summary

Health care professionals in nutrition and health care practices are faced with an almost overwhelming amount of information and expansion of knowledge in both the health and the nutrition fields. Easily accessible world-wide communication reveals new discoveries and information to the public before the respective fields are able to

update their practices. Expansion of technology increases the need for new information and skills and tends to depersonalize care for the individual. Finally, public awareness of their choices in nutrition and health care stimulates persons to try new methods, ask more questions and suspect health care providers who are not familiar with the information and techniques the public is seeking. These are but a few of the problems that face health care providers in today's society.

Nutrition and health care are complex issues, and information in both areas is incomplete and in the process of constant change. This challenges nurses delivering holistic health care to increase nursing research efforts, to continue to stress cooperative efforts with the clients they serve, and to work cooperatively and collaboratively with other health related fields, as well as to continue to increase their knowledge and skills to meet today's society's requirements.

The succeeding chapters include the following: a review of literature that includes historical and/or current information about nutrition, herbs, and health foods; a description of the field study design; the results of the interview survey of a north central Montana population of farm-ranch family members, including a family of Hutterites; and implications for health care professionals desiring to deliver holistic care. The data analysis and findings describe what nutritional and herb substances were used, what potential problems,

excesses, and/or deficiencies of the nutrients of herbs might produce, and what were the characteristics of the confirmed herb and/or health food users.

Definition of Terms

For the purpose of clarity, the following terms are defined:

Nutrition. The process of an individual's consumption, selection, acquisition, preparation, assimilation and metabolization of food, as well as its final elimination. Nutrition is considered in conjunction with the individual's education, finances, educational and knowledge level, religion, values, customs, culture, age, sex, anthropometry, and activity. The definition is inclusive of the term diet (Hoskins, 1978).

Herb. "A plant or plant part valued for its medicinal, savory, or aromatic qualities" (Webster, 1979).

Health Food. Any dietary substance natural or synthesized such as vitamins, minerals, "natural foods" (without preservatives), "organic foods" (grown without the use of chemical fertilizers or pesticides). (Some research articles included herbs in the health food definition.) For convenience, "health food" is used throughout the study to denote all foods categorized as organic, natural, and health foods.

Holistic Medicine; Preventive Health; Holistic Health Care;

Holistic Health Approach. Will be considered synonymous and inclusive of preventive health measures. These concepts include the whole person from the physiological, psychosocial, spiritual, and cultural aspects as well as one's relationship with the environment. The environment includes: family, peers, job and living situations, childhood background, self-concept, role in society, and all other factors which can affect human lives (Pelletier, 1977; Rogers, 1980).

Rural. Denotes areas where fewer than 2,500 people live, or in the open country (Copp, 1976).

Health. "An integrated method of functioning which is oriented toward maximizing the potential of which the individual is capable" (Dunn, 1967).

Unitary Man. "A four dimensional negentropic energy field identified by pattern and organization and manifesting characteristics and behaviors that are different from those of the parts and which cannot be predicted from knowledge of the parts" (Rogers, 1980, p. 331).

Environment. "A four dimensional negentropic energy field identified by pattern and organization and encompassing all that outside any given human field" (Rogers, 1980, p. 332).

Four Dimensionality. "The human and environmental fields are postulated to be four-dimensional. . . . Einstein proposed that the

three coordinates of space and the coordinate of time be synthesized to arrive at a new dimension--the fourth--and postulated the theory of relativity. . . . The concept of four-dimensionality postulated a world of neither space nor time. . . . Four-dimensionality is not a spatial dimension nor is it to be confused with four dimensions being proposed by other disciplines. . . . A four-dimensional world is clearly different from a three-dimensional world" (Rogers, 1980, p. 331) and requires abstract thinking. Unitary man is to be imagined as a four-dimensional energy field embodied in a four-dimensional environmental field.

Chapter 2

LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

The literature review specific to the exploration of behaviors of rural families who consume herbs and/or health foods for preventive health focused on the following topics: nursing in relation to the individual and environment with emphasis on those individuals who choose to pursue health through nutritional means; nutrition, as a science, as a health measure; vitamin-mineral supplementation including mega-vitamin therapy; herbs used for medicinal needs; preventive health in relation to medicine and the individual; and the placebo effect in relation to nutrient and herb practices. The information includes studies from health and nutrition related fields on specific nutrients, health foods, and herbs. The study's major concepts are related to Rogers' (1980) nursing theory, "unitary man and environment," which is inclusive of such concepts as open systems, "four dimensionality" from Einstein's theory of relativity, resonancy, helicy, and complementarity from the principles of homeodynamics, and the theory of accelerating evolutionary change (Rogers, 1980).

Conceptual Framework

The conceptual framework for the study is derived from several sources. Rogers' theory (1980) of nursing is central. Rogers defines nursing in relation to unitary man and the environment. Central to

her theory is the concept of holism, with nursing administering to the total person in need of nursing care. Rogers' views unitary man and the environment as open systems which interact with each other. The principle of resonancy states that man and the environment are considered as active energy fields with continuously changing pattern and organization. The term field implies the dynamic nature of man and the environment by incorporating the concept of energy which all matter has, and which all open systems must have to survive. Pattern and organization are terms used to identify the energy fields of man and environment, since an energy field is only meaningful in its wholeness. Rogers' view of man and environment, as whole units is antithetical to a part whole view, since a person is more than a sum of parts. The whole unit of man has characteristics and behaviors which include the ability to reason and have feelings, and is, therefore, a humanistic system.

By incorporating Einstein's theory of relativity into this framework and by using the term "four dimensionality," Rogers' conceptualizes "unitary man and environment" with abstractness and with fluctuating boundaries, and with limitless possibilities in their definitions, functions, and capabilities. The other two dimensions of "four dimensionality" are space and time. A continuous change process is understood within this framework because in open systems there is constant innovative change, with no going back and no repetition of

what was before, and because of the simultaneous interactions between the two dynamic fields, man and environment, that extend to the universe. These statements explicate the principle of helicy. In Rogers' scheme there is no causality only evolutionary developmental processes such as the processes of living and dying.

Rogers' time perspective is the "relative present." The individual's perception of time is always changing, and values are continuously changing. Man's capacity for health and illness is affected by the relative present, the experience of time passing and values changing. Rogers' view is optimistic, but not utopian.

Rogers' theory accounts for the uniqueness of the individual which includes energy patterns such as metabolism, emotions, and physiological processes that affect the nourishment of the individual. Behaviors related to eating serve needs other than to fulfill the physiological requirement for food. The process of eating involves the individual as a whole, physiologically, psychologically, socially, spiritually, and culturally.

The nutritional process can be subsumed under Rogers' homeodynamic principles. The principles of homeodynamics encompass the relationship of the concepts of unitary man and the environment. Individuals make their own health related decisions in relation to nutritional requirements. The principle of complementarity states that, "The interaction between human and environmental fields is

continuous, mutual, and simultaneous (Rogers, 1980). Nutritional choices are part of the dynamic environment which influences actions and decisions of individuals. The direction of change, more or less intake, herbs and other dietary supplements, is influenced by the individual, by individual decision making. Reality for individuals exists in relation to their perceptions. If individuals perceive the necessity for natural foods, herbs, and supplements then the need for those substances is part of their reality. Man and the environment are open systems interacting with each other, active energy fields with continuously changing patterns and organization according to the principle of resonancy. Availability of nutrients is part of the environment which people can choose to use or avoid according to their perceptions of reality. The exercise of choice contributes to the ongoing energy exchange between man and environment. Individuals, families exist within the relative present and make decisions based on their perceptions of reality. Individual views of society and contemporary values affect patterns of and organization of behavior. The principle of helicycomes into play when individuals want to make changes in nutritional processes to promote health, to affect the direction of change.

Rogers' theory of accelerating change is described in terms of increased longevity, expanding fields of science and technology, and many other changes which can be mutually connected to health related

nutritional needs and choices of individuals. Once an individual has decided to use nutritional supplements and health foods, change in life pattern accelerates.

Rogers implies a hopefulness and realism in the evolutionary change processes that involve unitary man and environment. The presence of disease is considered natural as is the possibility of unhappiness, the potential for errors and accidents and the encountering of new knowledge with which to revise old views. Implications of Rogers' theory for human service workers requires knowledge based assessment and action which takes into account the whole person in the relative present, as well as the patterns of action and interaction in the environmental field. Assessment and planning of care requires both practical and visionary consideration of the need for development of new norms based on multiple factors for use of nutrients for individuals. Multidimensional assessment of individuals can consider phenomena such as the placebo effect on other health care concepts which are now considered atypical or not taken into account.

Nutrition, Health Foods, and Herbs for Health

Nutrition

Nutrition, as a science, is the study of food and its relation to health (JAMA, 1964). Food has been used for health for centuries and

is also currently being emphasized as a health resource. The literature review revealed that nutrition in relation to health can be a controversial issue. Therefore some basic background nutrition information precedes the studies related to health foods and herbs for health.

In order for a nutrient deficiency to occur within the body one or more of the following factors have to occur: inadequate ingestion, absorption, or utilization of the nutrient; and/or increased destruction, excretion, or requirement of the nutrient. Conditions such as large body mass, increased developmental growth periods, and chronic or overwhelming disease process or fevers increase the requirements of nutrients in the body (Guyton, 1981; Bergerson, 1976; Williams, 1969).

The four basic food groups (grain products, meat group, milk group, and vegetable group) taken daily, in adequate quantities supply the nutrients needed to nourish the human body or supply a balanced diet. If the diet is poor, some nutritionists recommend taking a multi-vitamin that contains the Recommended Dietary Allowances (RDAs) as "nutritional insurance," but supplementation is not needed by persons eating a balanced diet which contains a variety of foods from the four basic food groups (Herbert, 1981; Alfin-Slater, 1980).

Foods are studied for their nutritive value and content by two methods. One is chemical analysis, which investigates the approximate

distribution of carbohydrates, fats, protein, water, and mineral elements in a given food. The second is biological assay, which is the study of laboratory animals with human-like metabolisms, under controlled conditions to determine the vitamin, protein, and mineral content of the diet, as well as the efficiency and assimilation in the body. Examples of other methods used to determine the utilization of vitamins are by "physical" methods (absorption spectra, fluorescence, and turbidity), or by microbiological assay, which studies the influence on the growth of bacteria (Bogert et al., 1966).

Years of scientific research by the above methods have produced nutrient requirement recommendations for the United States population. The Food and Nutrition Board for the National Research Council defines the RDAs by periodically reassessing current knowledge of the amounts of individual nutrients needed for the maintenance of health. The variability of individual needs are taken care of by setting allowances at sufficiently high ranges to cover upper limits of needs. Energy needs, expressed as average values are the exception. The new 1980 edition of RDA recognizes a wider age range for adults and reduces energy needs for older age groups. The daily energy requirement declines from 2900 kilocalories (age 19-22 years) to 2050 kilocalories after 75 years of age. Exact energy needs for individuals is impossible to predict, but the ranges and averages accommodate the needs of most healthy adults. The RDAs are used for

establishing the United States Recommended Daily Allowances (USRDA), which are used for nutritional labeling and replace the Minimum Daily Requirements (MDRs) (Nutrition & the M.D., Nov. 1977, Feb. 1980). An example of the USRDA can be seen in Appendix A, Table 1.

Food Used for Health

Since ancient times people have developed methods to deal with birth, death, and healing. It has been woman's domain in most cultures and societies to nurture and provide both preventive and therapeutic health care. Healers were commonly women who passed their art on to their daughters (Spector, 1979, p. 32). Food used for health or medicinal value has been described by anthropologists and nutritionists who studied various cultures. McKay (1971), Wilson (1971), and Wolff (1965) studied people in relation to food, illness, nutritional status, meanings of food and folk medicine, in areas such as West Malaysia, Malay, and Hawaii (Wolff, 1973).

Berenson, an associate professor of medicine at the University of Utah, stated during a lecture on "Nutrition Aspects of Preventive Medicine" that there is a need to increase society's information about nutrition to comply with the advances in science and technology. He went on to say that illnesses such as cancer can be prevented by life skills training (stop smoking, improve nutritional habits, exercise), and that dietary compliance for health care is difficult. He also said

the tendency of today's society is to find it easier to take pills than change health-nutritional behaviors, and that it is difficult to find scientifically credible data about nutrition (1981). A study done by G. Calvert and S. Calvert (1975) agrees with Jarvis (a health educator, 1980, 1981) and conclude the following: Natural foods are used as deterrents to illness or the effects of illness. There are misconceptions about products such as honey, whole milk, and food without preservatives. Natural products are thought to have "special" attributes such as "goodness" and are "easier to digest." Chemical treatments to food whether on it, in it, or even fertilizers for growing foods contribute to development of opinions about the nutritional qualities of the food. Most of those found to support the natural foods and vitamin-mineral supplementation "insurance" practices did so because of dogmatic reasoning that is because they believed foods had special attributes despite lack of evidence to that effect (G. Calvert and S. Calvert, 1975; Jarvis, 1980; 1981).

Another health food use study reported 59 percent of the confirmed health food users of the two city Texas study believed pesticides affect the nutritional value of foods (Rhee and Stubbs, 1976). Alfin-Slater (1978), of the UCLA School of Public Health, states that control of pests is an ongoing problem in the nutrition field and that pesticides at low effective levels are necessary to provide society with sufficient food supplies. She also states that

use of chemical fertilizers is criticized by the natural food advocates, but that both chemical and organic fertilizers are broken down into similar chemical compounds before they can affect the growth of plants. She further states that "organic" fertilizers may contribute to the spread of infectious diseases such as salmonellosis and cholera (Alfin-Slater, 1978).

The American public is especially aware of and receptive to nutrition and health matters. The movement to use health food, which includes vitamin-mineral supplementation, is progressive. A variety of authors say the movement is enhanced due to increased numbers of publications, scientific and lay, which report not only some facts but point to "sensational" effectiveness before substances are proven safe (Herbert, 1978, 1980; Wolff, 1973), and an increased number of health food stores and/or restaurants (Wolff, 1973; Jarvis, 1981). The primary reason health food consumers use health food regardless of increased cost, limited choice, and/or accessibility is for prevention of illness through assured balanced nutrition. They believe they are preventing illnesses such as heart disease, cancer, arthritis, and long term processes such as the aging process (G. Calvert and S. Calvert, 1975; Rhee and Stubbs, 1976; Alfin-Slater, 1978; and Graedon, 1980).

Vitamin-Mineral Supplementation

Campbell (1981), a Professor of Nutritional Biochemistry, recently participated in research projects sponsored by the U.S. Food and Drug Administration with the Doctors Allison and Fisher and reported the following: Surveys during 1973 through 1975 estimated that the number of consumers of vitamin-mineral supplements (nutrients) was about 55 percent of total consumers. The users were most likely female homemakers between 18 to 34 years of age, who had "high" nutritional knowledge, and who had children who were less than 18 years of age. The Federal Food, Drug, and Cosmetic Act (1979) prohibits the setting of limits on vitamin and mineral supplements except for treatment of persons with illness, for children, and pregnant or lactating women. Neither the precise minimal requirements nor their variability for the population are known for the macronutrients, such as protein, or for vitamins and minerals. Even less scientific information is available on excessive levels of nutrients that cause toxic effects. Ranges are used for the RDAs to prevent deficiency (lower range) or toxic doses (upper range). Most information on nutrient toxicity is from the short term megadose effects. Presently the public is more concerned about the toxic effects of excesses in calories, sugar, fat, and cholesterol than in excesses in vitamins or minerals. Finally, more public health concern will surface when the more subtle chronic effects of long-term

megadose nutrient practices are documented (Campbell et al., 1981).

Questions are being raised about what effect the consumption of excess levels of nutrients will have on health and what kind of intervention is needed if the practice becomes a problem for the public. Methods for determining nutrient intake, defining what nutrient toxicity is, and assessing data on nutrient toxicities for segments of the population are needed and are being explored by groups such as the one mentioned above.

Megavitamin Therapy

"Megavitamin therapy is treatment with quantities of one or more vitamins in amounts of ten or more times the Recommended Dietary Allowances of the Committee on Dietary Allowances" (Committee on Dietary Allowances, Food and Nutrition Board, National Research Council: Recommended Dietary Allowances, 9th revised edition, Washington D.C., National Academy of Sciences, 1980). There are proponents of megavitamin therapy who justify their beliefs with the fact that dietary recommendations are actually estimates based on averages of weights, age, and activity of the general population (Alfin-Slater, 1978).

Ingestion of vitamins or minerals, in quantities above required nutritional needs can lead to toxic reactions (Herbert, 1978, 1981; Jarvis, 1980, 1981; Bergerson, 1976). Studies show data concerning

nutrient actions, interactions, and that megadoses of nutrients can be toxic. Due to the extensive amount of information available only a few of the nutrients and their related studies will be reviewed below. Vitamins A, E, B, and C are discussed in that order.

Vitamin A. Vitamin A is recognized for its qualities of preventing or fighting infections. Studies by Beisel (1981) state that moderate increases of dietary vitamin A increase the resistance to infection in animals, increase responsiveness to antigenic stimuli and accelerate the rejection of skin grafts. Studies by Edelman (1977), Dreizen (1978), and Beisel (1979) indicate that deficiency of vitamin A in humans increases the incidence of infections by possibly impairing I_gA (immunoglobulin A) production.

Brin (1976) reports that chemicals which are foreign to the body are metabolized by oxidation processes in the tissue cells of the body. The oxidases or enzymes and co-enzymes (vitamins) metabolize chemicals and help to remove them from the body. Vitamins can increase this activity for drugs taken into the body; or vitamins can be inhibited by drugs. Vitamin A is diminished in the blood by pollutants such as polychlorobiphenyls (PCB) and DDT. Benzopyrene and spironolactone also reduce the blood levels of vitamin A (Brin, 1976).

Emulsified vitamin A, the vitamin promoted by the health food industry is more toxic than the usual preparation of the vitamin (Herbert 1980; Korner and Vollen, 1975). Toxic levels of vitamin A,

hypervitaminosis A, is categorized as acute and chronic. Hathcock, associate professor in the Food and Nutrition Department of Iowa State University (1976) reports that chronic symptoms of hypervitaminosis A include dermatoses, alopecia, anorexia, persistent nausea, and enlargement of the spleen and liver. (Other toxic effects of the vitamin can be reviewed in the data analysis section of this study.)

Infants are more susceptible than adults to toxic levels of vitamin A. Their symptoms vary with their age. Transient hydrocephalus is seen in infants (Hathcock, 1976). Rat embryo studies demonstrate other conditions such as macroglossia, cleft lip, cleft palate, and abnormal eye development (1976). Jarvis (1982) reports an example of hypervitaminosis A in an infant whose mother fed her large doses of vitamin A (following recommendations in Adele Davis' book Let's Have Healthy Children) which resulted in the infant's nervous system being damaged and her physical development dwarfed for life (ACSH News and Views, November, 1979).

Graedon (1980) reports that taking vitamin A dosages of 40,000 IU every day for months can result in toxic reactions in adults. However, a study done by dentists found that persons taking nearly 33,000 IU of the vitamin were the "healthiest" persons in their study sample (Cheraskin et al., 1976).

Vitamin E. Due to its therapeutic effects on animals, vitamin E is referred to as "the vitamin in search of a disease" (Alfin-Slater,

1980). Many physiological benefits are associated with vitamin E in animal studies. Benefits included healing skin lesions, improved muscular ability in muscular dystrophy, prevented ulcers, and diminished sterility in males and females. These effects have not been observed in humans.

Studies that have provided support for vitamin E therapy are as follows: Vitamin E administration to premature infants has decreased the incidence of bronchopulmonary dysplasia, and decreased retrolental fibroplasia in infants with oxygen administration and without oxygen administration (Bieri and Farrell, 1976; Ehrankranz et al., 1978; Oski, 1977). Vitamin E was found to be beneficial in treatment of children with cystic fibrosis due to its ability to improve the absorption and utilization of fats (Nutrition Reviews, 1977; Winick, 1978). The use of 300-400 mgm of vitamin E for three to six months was found to be effective in decreasing cramps (intermittent claudication) in the calf muscles of the leg while walking (Oski, 1977; Horwitt, 1976).

Herbert, a hematology and pharmacology professor and researchist, disputes some of vitamin E therapy. He states that premature infants have the tendency to destroy red blood cells and this was caused by iron supplements in the formulas. Iron in association with polyunsaturated fats (PUFA) causes cell membrane fragility and increased hemolysis. When iron is withdrawn hemolysis stops without

the vitamin E therapy (1980).

Beisel et al. (1981) state acquired immune dysfunction in man occur with excesses of fatty acids and vitamin E. The study found that doses two to ten times the minimum requirements of vitamin E enhance antibody response, enhance delayed dermal hypersensitivity, produce clearance of particulate matter of the reticuloendothelial system, and increases host resistance and ability to survive experimental infections. However, megadoses (over ten times RDA) in healthy volunteers was found to inhibit the immune functions (1981).

Hathcock (1976) reported that megadoses of vitamin E and vitamin K induce deficiency in each other's actions. Studies by Hayes and Hegsted (1973) supported this study.

B Vitamins. Green reports that consuming more than 1000 mg. of niacin (B_5) over a period of time can cause liver damage, aggravate existing stomach ulcers or gastritis, upset sugar metabolism and increase asthma attacks for susceptible people (1978). Nicotinic acid (niacin B_5) reduces blood cholesterol, but it was not found to reduce the chance of death from heart attack (Moran and Greene, 1979) and caused increased cardiac arrhythmias, gastrointestinal problems and abnormal blood chemistry finding (cited in JAMA, Jan. 29, 1974).

Double-blind studies were done during psychological clinical use of niacin on schizophrenic patients in 1952 and since findings indicated the drug improved the mental health (Pfeiffer, 1975), but

other tests reported from the American Pharmaceutical Company (Ivey, 1977) refute these studies with what Graedon (1980) calls the "most controlled studies" which did not show significantly different results between niacin therapy and placebo therapy (Graedon, 1980).

Folic acid (B_9) increased dosages masks pernicious anemia which is caused by vitamin B_{12} deficiency (Hathcock, 1976). A study by Serle and Blair (1973) stated in rats three weeks of 75 mg/kilogram of body weight produced changes in renal anatomy and renal resorptive function (Nutrition Reviews, March 1976). Folic acid in excess dosages can counteract the actions of vitamin B_{12} and anticonvulsant drugs (Graedon, 1980).

Researchers at the University of Wisconsin are suggesting that pyridoxine (vitamin B_6) is effective in the treatment of bladder cancer patients (121 patients) and breast cancer patients (American Family Physician, 1978). The vitamin therapy was as effective as the usual chemotherapy in the bladder cancer patients and the breast cancer patients were found to have a depleted B_6 level in their bodies even with normal diets. Rose (1978), who headed the study, concluded that the vitamin may not prevent the onset of the disease, but might be beneficial to those women who already have the disease.

Brin (1976) reports that consumption of alcohol reduces blood levels of thiamin (B_1), pyridoxine (B_6), and folacin (B_9) and

interferes with the absorption or conversion of the vitamins. Young (1981) cited that Baker et al. (1979) in a study on elderly persons report that the vitamins B₆ and B₁₂, niacin, folate, thiamin and ascorbate were deficient. These findings were similar in institutionalized and non-institutionalized patients (Nutrition & the M.D., January, 1981).

Vitamin C. Vitamin C (ascorbic acid, the anti-scurvey vitamin) has probably produced the most contradictory information about the benefits of megadose nutrient therapy of all the vitamins. Intensified study of vitamin C began after Pauling, a Nobel prize winning chemist, wrote Vitamin C and the Common Cold (1970), and has continued since with studies on use of vitamin C for cancer (Cameron and Pauling, 1976). Pauling proposed that 1000 mgm of vitamin C a day would lead to fewer colds (45 percent) and fewer days of sickness (65 percent) (1970).

In the mid-1970s, the Recommended Dietary Allowances (RDA) for vitamin C was reduced from 60 mgm daily to 45 mgm daily due to scientific research by nutritionists and physicians on the need for vitamin C for persons in the United States. Nutritionists and physicians generally agree that ten milligrams of vitamin C will prevent and/or cure scurvey, and that 45 to 60 mgm of vitamin C daily is probably sufficient for this society. Anderson (1977), a Canadian epidemiologist, states that Canada's daily allowance for vitamin C has

been 30 mgm for years. He further proposes that 120 to 150 mgm of vitamin C daily would provide the optimum blood saturation levels for most normal healthy adults (Nutrition Today, January/February, 1977)

Further research on the effects of vitamin C stimulated the revised daily RDAs (1980) for vitamin C to be raised from 45 mgm to 60 mgm (Nutrition & the M.D., February, 1980). Vitamin C requirements were increased because research indicated that daily intake of 45 mgm to 60 mgm of the vitamin maintained a satisfactory ascorbic acid pool in the body. Another factor that promoted the increased allowance for the vitamin was that it was found to assist in iron absorption, which benefits body processes (Nutrition & the M.D., February, 1980).

The literature review revealed a large amount of controversial information about vitamin C and its effects on colds, cancer, stress, and heart disease. A sample of some of the studies that support or refute megadose vitamin C therapy is related below.

Vitamin C and Colds

Miller et al. (1977) using megadose ascorbic acid therapy tested forty-four monozygotic twins whose treatment group experienced shorter and less severe colds than the control group (Pelletier, 1980).

Wilson (1978), an Irish researcher stated that 550 mgm of vitamin C daily protected 30 to 40 percent of the school girls against colds but had little effect on boys. He concluded that the positive results of

his study were due to naturally produced colds rather than the nasally induced viral infections reported in other studies (Graedon, 1980).

Herbert, in Foods, Fads, and Fantasy (1980) states that in a 1974 radio broadcast between Pauling and Herbert that Pauling admitted "that there is no evidence that vitamin C prevents colds." Anderson (1977) of the University of Toronto relates that Beaton and Whalen, of that same university, in a period between 1972 and 1973, did a double-blind study with 818 volunteers who took a similar looking 1000 mgm vitamin C or placebo capsule daily. They increased doses to 4000 mgm daily during the first three days of any illness. The trial ran fourteen weeks with individuals keeping records of sickness. Episodes of illness were seven percent lower in the vitamin group and presented a twelve percent difference in the total days of illness, but those findings were not found to be statistically significant. The vitamin group were "confined to the house" by thirty percent less than the placebo group (767 days). The conclusion was that vitamin C had in some way reduced the severity of symptoms but did not significantly prevent or cure colds (Anderson, 1977).

In a second trial, in Toronto, the next winter with over 2000 volunteers, Anderson's group tested for the effects of dosage using 250 to 2000 mgm daily (1977). The volunteers were divided into eight groups with two placebo groups. The researchers determined that the regular prophylactic dose alone had little effect on sickness rate,

days of symptoms, or confinement. One of the placebo groups was found to have the least number of colds. The study was compared with the previous Canadian test and a test done in Arizona on Navajo children which indicated vitamin C therapy prevented colds. Conclusions were reached that the subjects' previous nutritional status possibly made a difference in the benefits received by the vitamin C megatherapy. Anderson stated it was revealed later in a second study done by the same Arizona group who had studied Navajo children that there was no evidence that vitamin C prevented colds when the tests were done with more scientific methods (1977).

Vitamin C and Cancer

A clinical trial with 100 terminal cancer patients treated with daily doses of 10 grams of supplemental ascorbic acid was conducted in Scotland by Cameron and Pauling (1976) in the 1970s and reevaluation of them was published in a series of four articles by Cameron and Pauling (1976). The sample group of terminal patients were compared with matched control patients (1000 similar cancer patients) who were treated the same as the sample group except for the vitamin C therapy. The average survival time of the sample group was found to be four times as great as for the control group. Death occurred for 90 percent of the sample group at one-third the rate of the control group. The other 10 percent had an average of 20 times greater

survival time than the controls. Conclusions of the researchers were that vitamin C therapy was a simple and safe form of treatment for patients with advanced cancer (Cameron and Pauling, 1976).

A study at Mayo Clinic done with randomly assigned, cancer patients (60 vitamin C treated patients and 63 control patients) closely matched for age, sex, primary tumor site, and other criteria were given vitamin or placebo capsules under double-blind control procedures by Creagan and his colleagues (Medical World News, June, 1979). The Mayo Clinic group found similar survival curves for the sample and control group (median seven weeks) and no significant difference in appetite activity level or pain complaints. (Medical World News, June, 1979).

When Pauling was apprised of the United States study he stated the difference in results was due to the United States patients receiving chemotherapy that cancelled vitamin C's effects (Pauling, 1980). The Mayo group admitted the patients, with the exception of nine, all had received cytotoxic agents but stated they were "all capable of immune response" (Medical World News, June, 1979). A review of Cameron's and Pauling's study finds that they described the treatment of their cancer patients at the Loch Lomond site area as initially conventional, "by operation, use of radiotherapy, and administration of hormones and cytotoxic substances" (Pauling, 1976, pp. 3687-3688). A later exchange of letters between the Mayo Clinic

researchers and Pauling found in The New England Journal of Medicine, March 20, 1980, finds Pauling stating he had stated in a letter to the Mayo Clinic group that if they hoped "to repeat the work of Cameron as closely as possible, you should be careful to use only patients who have not received chemotherapy . . ." and "Dr. Cameron and I have concluded our recent analysis of the evidence with the following words:

With the possible exception of during intensive chemotherapy, we strongly advocate the use of supplemental ascorbate in the management of all cancer patients from as early in the illness as possible. We believe that this simple measure would improve the overall results of cancer treatment quite dramatically, not only by making the patients more resistant to their illness but also by protecting them against some of the serious and occasionally fatal complications of the cancer treatment itself" (Pauling, 1980).

Moertel and Creagan (1980), of Mayo Clinic in the same article stated that some of Pauling's quotations concerning correspondence between the groups were not true and that in later information following the Mayo Clinic study that "Dr. Cameron informed us that patients from this hospital were referred to other centers if they required such treatment" (chemotherapy) and "In our introduction we relied directly on Cameron and Pauling's published and uncorrected words, 'All of the patients are treated initially by a perfectly conventional way, by operation, use of radiotherapy . . .'" (Moertel and Creagan, 1980).

Herbert (1980) and "a number of cancer experts" (Miller, 1977) reviewed the above vitamin C and cancer studies and attributed the four-fold increased survival rate of the vitamin C treated patients to the placebo effect (Herbert, 1980). Herbert supported the statement with

The fact that the patients were in the hands of enthusiastic doctors who felt they could help. This goes on in every cancer center in the United States! . . . The hope of the patient, and the fact that the doctor is interested in the patient makes a tremendous difference; this relates to the placebo effect (Herbert, 1980, p. 139).

The placebo effect is discussed later in the chapter.

Vitamin C and Heart Disease

Graedon (1980) states that studies have shown that guinea pigs and/or humans in relation to atherosclerosis and find sufficient doses of vitamin C protected guinea pigs and some humans against atherosclerosis (Weiser et al., 1977; Hayashi Eiichi et al., 1978; Ginter, 1978). Theories concerning the vitamin's effectiveness in the area include its possible ability to increase the conversion of cholesterol from bile acids and speed it out of the body, its protection of the integrity of cell walls, and by its anticoagulant activity which prevents blood clots (Graedon, 1980).

An Observer's View of Vitamin C

Anderson (1977), a professor of epidemiology, in the Department

of Preventive Medicine and Biostatistics, University of Toronto, explains vitamin C's possible role in colds, stress, cancer, and heart disease below: First, vitamin C is a simple molecule synthesized from glucose, is an acid, is a reducing agent, and is an antioxidizing agent (similar to vitamin E). The vitamin is present in most tissues and concentrated in the blood cells, adrenals, liver and brain. Metabolically it functions to transfer energy and maintain optimum integrity in the tissue by maintaining both the tissue Eh and pH within relatively narrow limits. (Eh is the redox potential having to do with the oxidant/reductant balance in the body.) Vitamin C may also help protect lipid membranes from being destroyed by oxidation processes.

Vitamin C's value to a wide variety of tissues may explain some of the recovery from disease that theorists have proclaimed. Anderson suggests more human and animal studies need to be pursued under controlled scientific conditions to be sure that high doses of the vitamin are not used indiscriminately (1977).

Anderson next suggests that in the stress/saturation ratio the difference in the studies on vitamin C and colds could be due to variable saturation levels. He compared the study results of the Navajo children who had less optimum dietary levels with the one conducted with well nourished volunteers. He stated the average adult vitamin C storage level in the body is about 4000 mgm. Stored

vitamin C declines at about three percent a day so to maintain that pool approximately 120 mgm per day are needed "assuming the same 3 percent daily rate of decline" (1977, p. 8). Anderson added that most vitamin C tests are done in relation to scurvy symptoms, and that both stress and scurvy study methods are prone to have experimental variation.

Vitamin C may help to reduce the impact of cancer by blocking cancer cells with an adequate concentration of the vitamin in normal cells, and by its reducing agent activities which prevent oxidation transformation from taking place. As an antioxidizing agent it may neutralize radicles that possibly form a link between ionizing radiation and cancer. An optimum saturation of vitamin C in the blood and tissues may be another way to enable persons to face the stress of illness such as surgery, chemotherapy and radiotherapy. More trials could ascertain if this would also improve the quality and quantity of life.

Anderson's view of a third possible way that vitamin C may be helpful in cancer is as an anti-cancer drug, using huge doses (10 to 30,000 mgm per day). He states this theory is based on the hypothesis of Cameron, a Scottish surgeon, who postulated that cancer "focused on the ground substance surrounding the cell rather than the cell itself" and that normal tissue ground substance inhibits cancer cell growth (Anderson, 1977, p. 12). In this action vitamin C is viewed as a

"physiological hyaluronidase inhibitor" (PHI), which limits the dissolving action of the enzyme hyaluronidase and could possibly slow down the rate of cancer cell multiplication. Anderson related other studies that likened this action to vitamin C's role in scurvy. He believes further studies are needed in this area that will consider the "risk/benefit ratio" and the severity of the disease as well as other treatments that are available in cancer therapy (Anderson, 1977).

Anderson's review of studies in relation to vitamin C and heart disease found that there is controversy about the serum lipid level benefits of vitamin C and that "response to vitamin C therapy vary according to the initial vitamin C status of the subjects, with those already on high intake having little or no room for improvement" (1977, p. 11). He related other factors that possibly affected the results of the studies were the duration of the experiment and the presence or absence of other disease or abnormal metabolic conditions (1977). However, Anderson also related other studies that gave evidence that higher levels of vitamin C in the blood keep blood vessels healthy, that arterial walls of men who died from heart attack had abnormally low levels of ascorbic acid, that persons on vitamin C therapy before and after surgery had less venous thrombosis, and that possibly fully saturated heart muscle cells are less vulnerable to poor blood supply (1977).

In conclusion, the literature review on vitamin C therapy is controversial, but the controversy has stimulated more careful research methods. The research may not lead to additional benefits from vitamin C, but may provide more definitive answers in relation to some of the dreaded diseases of our society. Toxic effects of vitamin C are reviewed in Chapter 4.

Minerals

Studies on the benefits and the danger of major and trace minerals are as copiously documented in the literature as the vitamins. Drug, physiology, and nutrition authors document the dangers of excessive amount of the minerals in the body. Toxic levels of the minerals effect the fluid and electrolyte balance, the oxidative and enzymatic processes of the body.

Two nutrition publications reported studies on high protein and high fiber diets that decrease the absorption and increase the need of the major minerals calcium, phosphorus, and magnesium, and of the trace minerals silicon, zinc, and copper (American Journal of Clinical Nutrition, 1979; Agriculture Research, USDA, March 1979). Except for iron, trace mineral deficiency is relatively uncommon among people eating a balanced American diet (Nutrition & the M.D., Aug., 1980). Hathcock (1976) reports that trace elements are potent toxicants (copper, molybdenum, manganese, zinc, fluorine, and selenium).

Interactions between the elements affect each other's toxicity either by diminishing or potentiating toxic effects. Copper deficiency increases the potential action of zinc, mercury, and silver, yet zinc deficiency increases susceptibility to toxicity of copper and cadmium, but not silver. This competitive antagonism is influenced by their cation structure and similarities in anionic molecular orbitals, which aid in oxidative phosphorylation processes (Hill and Matrone, 1970; Nutrition Reviews, March, 1976).

Consideration of Differences in Tolerance

Various age groups have different tolerance to the nutrients as explained in vitamin A literature reviewed above. The older age group of people also tolerate excesses in nutrients less. Young and Blass (1981) found that the aged need fewer calories, but more protein, vitamins, and minerals than younger adults. However, due to physiologic disabilities, the elderly person's nutrient intake may be decreased. Inability to purchase, prepare, and ingest foods result from conditions such as cardiovascular disease, stroke, arthritis, and poor dentition. The decreased senses of smell, taste, sight, and hearing interfere with the palatability (preparation of food), and social aspects (Nutrition & the M.D., January, 1981).

Depression, decreased incomes, and cultural customs also affect food choices and consumption. Documentation on vitamin deficiencies

in institutionalized and non-institutionalized elderly persons reveal the B vitamins were deficient, especially B₆ and B₁₂ (Baker et al., 1979). Iron and calcium levels are also found to be deficient in the elderly (Young and Blass, 1981). Decreased calcium and vitamin D were said to possibly exacerbate osteoporosis in women (1981).

As the major consumers of prescription and non-prescription drugs, the elderly are prone to either nutrient problems due to lack of appetite, taste, and interference of specific nutrients by drugs. Busse (1978) recommends use of dietary supplementation with complete multivitamins at RDA levels to restore the blood levels and enzyme activity of the elderly. He states that cost is less than foods to correct deficiencies and outweigh the possible complications of their use (Nutrition & the M.D., January, 1981).

The 1980 RDA for the mature adult is separated into three age categories with "light" physical activity requirements stated. The age categories are 23-50 years, 51-75 years, and 76 plus years. At each second and third age group the calories are reduced by an additional 200 (female) or 300-350 (male) compared to the 23-50 year requirement (Young and Blass, 1981).

Herbs

Nutrition, as a component of health, has been recognized as essential for the fulfillment of man's medicinal needs since the

Babylonian and Assyrian civilizations recorded fighting illnesses with herbs. The field of pharmacology developed from the use of natural products such as wild herbs and berries (Spector, 1979). Modern physicians still prescribe some of these medicinal substances (deadly nightshade, henbane, and thornapple or jimsonweed) in the form of alkaloids. Approximately 400 kinds of cardioactive glycosides have been identified from the herbal kingdom (Aikman, 1977). Twenty-five percent of the formal health care pharmaceutical agents that are used today are derived from plants (Jarvis, 1981).

Paracelsus (1493-1541) stated "that the pastures and hillsides are pharmacies" (Schauenberger and Paris, 1977, p. 9), and "that the dose determines a poison" more than four centuries ago (Campbell, 1981). Paracelsus suggested that everything ingested in excess is toxic. This philosophy of the ancient Greeks, "moderation in all things," which has persisted through the centuries is a general truth in nutrition and drug therapy today as well, for large amounts of nutrients or drugs are hazardous to health. Graedon (1980) and Jarvis (1980) agree that the same can be said for the use and consumption of herbs.

"Herbs, like all good natural foods are preventive remedies containing essential vitamins, minerals, hormones, and enzymes" (McGrath, 1979). Herbalism is the use of medicinal substances found

in non-poisonous plants for prevention or correction of disease (Hutchens, 1973). Use of herbs and folk medicine practices persist from mistrust of anything artificial, from a political statement of persons with a counterculture view of the American medical establishment, and from economic/geographic conditions that prevent formal health care (Medical World News, Dec., 1973). Persons are also using medicinal plants because they are "natural" and they are exchanging recipes for their use.

Clinics and classes are being conducted in herbal medicine in the state of Washington (Brady, 1973). Some California and Washington physicians are prescribing both herbal medicines and pharmaceutical drugs. The physicians support these practices with the following statements: "Fifty years ago every physician practiced herbal medicine;" ". . . using herbal medicines can help the patient to become aware of what is happening inside his body" (Anderson, 1973); and "Obviously, certain conditions are better treated by more scientific approaches. But we tend to over look the importance of host response in disease, and if a patient feels he can contribute to his treatment, it often speeds his recovery" (Coombs, 1973; Medical World News, Dec., 1973).

The movement back to home remedies, using herbs, raises some questions of safety and efficiency of the products. Brady, a professor of Pharmacognosy and Chairman of the Department of

Pharmaceutical Sciences at the University of Washington College of Pharmacy, states there is much research to be done in the area of herbal medicine before safety can be assured for those who diagnose and treat themselves with herbal remedies (Medical World News, Dec., 1973). Brady (1972) also stated the following:

Reliable studies on the use of herbal medicines are scarce. The cost of investigating plants is high therefore unless a plant looks promising for an area in which other drugs are totally inadequate it is doubtful that it will be investigated by drug companies. Studies have been done on efficacy rather than causal relationships. Quality control of these studies is difficult to determine due to such variables as difficulty of standardization of dosage and preparation, and other effects of herbs on individuals. Information has to be taken from various chemical and biological sources and then placed in the best possible perspective for any given situation which happens to be at hand. Thus, the situation is frequently more one of calculated judgment than documented scientific fact (Brady, 1973; Brady, personal communication, May, 1982).

(Brady's summary and comments on some of the drugs used in the study can be reviewed in Appendix C.)

Herbert, presently Chief of Hematology and Nutrition at the State University of New York Downstate Medical Center, states, "No therapy is safe or efficacious until proven so" and that "Magical thinking cannot overturn the fundamental axiom of therapy, primum no nocere - above all do no harm" (1980, p. 148) in relation to the use of health foods (herbs).

Herbs are used as additives, in general dietary practices for their flavor contribution to the basic food groups, and for their

medicinal qualities. Herbs can be used in preparations called decoctions, essences, fomentations, ointments, salves, plasters, poultices, syrups, and tinctures (see definitions in Appendix G). Specific herbs and preparations (recipes) are described which are to be given for specific conditions in herbal publications. A small paperback book lists approximately 100 herbal teas with captions of "self-treatment with Natures' medicines" (Ceres, 1979). Other books cover the cultural aspects of the use of herbs, like the North American Indians, which included the United States, Canada, as well as comparisons of herbs and bibliography from Russia, a country which has much literature on herbology (Hutchins, 1974). Most of the references have a statement in them that cautions persons using herbs to take precautions in the harvesting, selecting, preparing, and administering of herbs, and that herbs can be poisonous or harmful if taken in excess.

Nature's Healing Arts From Folk Medicine to Modern Drugs, by Aikman (1977), is a National Geographic Society publication that has a general review of historical to modern use of herbs. The author related generally many personal interviews with herbalists, physicians, and scientists on herbology. Information was given on herbs that are being studied to use for cancer, leprosy, and heart disease by pharmaceutical or specific disease research centers. Photographs enhance the information provided about folk medicine,

herbalists, herbs, and scientific procedures being used today in health care and research (Aikman, 1977).

Reference to volumes like National Geographic above on herbs, herbalists and modern medication and the Rural Efficiency Guide point out the availability of material to lay people. An older reference, The Rural Efficiency Guide (1918) is a four volume self-help reference for rural persons. The four volumes are on the topics of health, engineering, agriculture, and stock. The volume, Health, was written by a registered nurse, Blanche Swainhardt, and included emergency and home treatments that recommended the medicinal use of herbs (1918, p. 1-299).

Seigel, a researcher from the departments of psychology and pharmacology of UCLA, found an increase in the medical and non-medical use of herbal products in forms of teas, capsules, smoking mixtures, and cigarettes for the purpose of "health and happiness" (1976). Seigel related there are 396 different herbs and spices available, used singly or in combinations as in herbal teas. Forty-three of these teas contain psychoactive agents, but are of minute quantities and present few or no behavioral effects unless they are used in combination with herbal capsules. Long term use of herbs containing psychoactive ingredients, even those with minimal or non-existent effects, need to be monitored for possible cause of medical side effects. There are 192 herbs available and used as commercial smoking

substances, and 44.4 percent of these preparations have known psychoactive effects. Twenty-five specific psychoactive (marijuana-like) substances were listed with actions and side effects. It was reported that use of some of the herbal smoking mixtures have resulted in intoxication similar to that caused by marijuana (Seigel, 1976).

Jarvis, a health educator, and President of the California Council Against Health Fraud, teaches a consumer health course called "Food Faddism, Quackery, and Cultism" at Loma Linda University in California. Jarvis compiled a list of 42 potentially dangerous herbs and gave the list to the students of his class. The students visited 23 health food stores in seven Southern California cities and found that all of the stores offered some of the herbs for sale. One store carried 29 of the potentially dangerous herbs and the average of all the stores was 14.7 (The Sunday Sun, Aug. 30, 1981).

Jarvis (1981) stated, during a workshop called "Frontiers in Nutrition," in Great Falls, Montana, the following comments on herbalism and health foods: "Herbalism needs to be handled scientifically. Prescription by suggestion, pharmacognosy, is legal and is the term for the use and prescription of herbs. (Pharmacognosy is a ". . . branch of pharmacology concerned with the study of medicinal substances in their natural, unprepared, or crude state" (Dox et al., 1970).) "Naturalism and holism are terms used in

nutrition quackery" (Jarvis, 1981) as well as legitimate health care.

The public assumes that nature and natural is better. There is no real definition of quackery, it can be "something we do not like." Dangerous quacks are those who believe in the system that they will die for it. Nutrition is common ground for food quackery, faddism, and cultism. People choose nutritional means for securing health for emotional reasons. Nutrition quackery does harm by distorting perspectives, by carrying on a war against physicians, by using fear versus free choice, and by leading some to malnutrition. Nutrition quackery causes an over reliance on diet, promotes the concepts that health is natural, disease is unnatural, and that if one eats the right foods one will not have disease. Cultism-quackery does not believe that all living systems have a degeneration" (Jarvis, Notes 1, 1981).

Preventive Health

Pelletier (1980), in a book on a "holistic preventive medicine" approach to health care addresses a complimentary and comprehensive scheme of concepts that relate to the holistic/humanistic nursing concepts of Rogers (1980) which are stated in an earlier section of the chapter. Pelletier states that when prevention against illnesses of society is the emphasis "more subtle psychosomatic and psychosocial variables are involved than those considered in the crisis intervention health care model" (1980, p. 31). Of the six conceptual statements on which Pelletier's "new medical model," "the holistic preventive medicine model" (1980) is based on the final conceptual statement which follows. "This is a unique time in history when basic sciences and philosophy are converging to transform man's view of

himself and the afflictions from which we all suffer" (Pelletier, 1980, p. 39). In this area Pelletier discussed the following "ethical implications" that are pertinent for holistic health care providers to consider: First, there is a need for science to deal with people as people and not as things. Next, people are choosing various ways to spend their money such as for alcohol (22 billion dollars in 1975) and tobacco (12 billion dollars) rather than on cancer research (400 million dollars in 1975). Finally there is a need for society to cure its own diseases or "diseases of choice" such as obesity, heart disease, and hypertension (Pelletier, 1980).

In relation to the above "ethical imperatives," Jarvis (1981) related that persons in the United States are annually spending ten billion dollars on weight loss products, two billion dollars on vitamin supplements, over one billion dollars on Laetrile for cancer, and one billion dollars for drugs to relieve arthritis symptoms (Jarvis Note, June 1981). Cousins (1979, 1980) confirms Pelletier's view of the need for science to deal with people as people. He expressed the public's concern and increasing independence in health care choices by stating that the holistic approach is concerned both curatively and preventively with healing the body as well as personal relationships. Cousins had the experience of working collaboratively with his physician to overcome a supposedly crippling and irreversible disease. He stated that the human mind and body have a natural

apothecary, and the individual working with health care providers can maximize the effect of medical treatment (Cousins, 1979; Pelletier, 1980).

The placebo effect is included in the study since there is controversy about the effects of vitamins, minerals, and herbs. Studies point to the placebo effect causing improvement in patients with various illnesses.

The Placebo Effect

When considering the use of medicinal plants (herbs), the vitamins, and minerals for health, all of the studies are likely to be contaminated or influenced by the placebo effect. Research on the placebo effect has increased since Beecher's work on pain tolerance with injured soldiers in World War II and similarly injured civilians (1955). Beecher found with similar injuries that 68 percent of the soldiers needed no morphine while 83 percent of the civilians did need morphine. He contended that the placebo effect is at least one half as effective and powerful as morphine in treating real pain (JAMA, Dec. 24, 1955).

More recently the placebo effect is being related to the release of endorphins by studies in the United States and to the effects of acupuncture by studies in China. West, an adult nurse practitioner, related the endorphin action by using the gate control theory as a

model (1981). She explains that endorphins are substances which were first discovered from research of animal brains, and which are now known to contain opiate-like chemical substances that stimulate certain opiate receptor areas of the spinal cord. There are several of these polypeptides in the body. The first was called enkephalin from the Greek term "in the head." The later identified polypeptide (a larger one from the hypothalamus-pituitary axis and the midline of the encephalon and anterior pons) was called endorphin. This term now generally encompasses all the polypeptide opiate-like substances (West, 1981).

Endorphins located in the synapses between nerve fibers probably transmit, modify, and inhibit noxious stimuli through blockage of another peptide, substance P, which transmits noxious stimuli. Pain is relieved by endorphins along or with their release with other pain relief measures. Some people probably possess higher endorphin levels than others. Persons receiving acupuncture and nerve stimulation procedures have higher levels of endorphins following those procedures. The effects of endorphins can be relieved by administering Narcan, an opiate antagonist. Endorphins, call the "happy peptides" can produce euphoria and reduce anxiety, but are believed to be able to be as toxic as opiate plant substances (West, 1981).

The pain relief, relaxation, and euphoria effects of endorphins

may produce some of the effects consumers of specific vitamins, minerals, and herbs experience. Herbert (1980) says there is danger of prescribing such substances unless a person is monitored so that subjective symptoms do not progress into a serious underlying disease process (1980). He also states that lay persons do not know that the placebo effect works for physical disease symptoms as well as emotional symptoms. Herbert suggests that using therapy without knowledge of what one is doing is quackery and that no scientific data has been published to demonstrate that vitamin or mineral supplementation is needed when healthy people are eating a well balanced diet (Herbert, 1980). Alfin-Slater, a nutritionist and researcher (1978) and Jarvis (1980), a health educator agree.

Summary

The literature review and conceptual framework contain concepts that are related to nursing's approach to the care of man in today's society, and holistic health care concepts that emphasized preventive care, specifically in the areas of nutritional health needs. As may be seen from the above review of literature, there are many areas that nurses could study and need to know about the use of nutrition, herbs, and health foods for preventive and therapeutic health care.

Chapter 3

METHODOLOGY

Herb and/or health food consumption by rural populations has many unexplored areas. To explore the area of what herbs and/or health foods were being used by farm-ranch family members for preventive or therapeutic health an exploratory descriptive field study design was selected. The field study, ex post facto in nature, did not introduce treatments or manipulate variables, but it did isolate a particular segment of a social structure to examine its practices, behaviors, and characteristics (Polit and Hungler, 1979).

An aim of the study was to provide some background information for more scientific field studies which test hypotheses. It is understood that because the design is ex post facto in nature, and because the researcher worked with a pre-existing group which was not formed by a random process but rather by a "self-selecting process" that causal relationships cannot be ascertained (Polit and Hungler, 1979). "Self selection" in this study means the sample had characteristics that possibly influenced or were related to the variables of the research question (Polit and Hungler, 1979).

The study utilized a survey method, a personal "interview schedule," to elicit information and provide a detailed and realistic picture of the interrelationships among the behaviors, practices, and

characteristics of the rural sample (Polit and Hungler, 1979). Some ethnographic interview and observation techniques were used during the survey with the purpose of understanding a way of life, and to learn from the people by observing them, ". . . listening to them and 'making inferences'" (Spradley, 1979, p. 3, 8).

The design of the study provided a means to collect a large amount of data on what herbs and health foods the rural sample were using. The information may be able to be used for further research that is needed in the area of herb and/or health food consumption for preventive or therapeutic health.

Selecting the Sample

The sample of the study included twenty farm-ranch family members, plus a comparative family of Hutterites. Farm-ranch family members from Teton County were selected to interview because Teton County is primarily an agrarian area, and because agrarian populations have activities that pertain to nutrition for society. The rural sample was also chosen because it has been suggested that rural people are as likely to be ill as urban people, but they are less likely to seek formal health care for minor ailments and symptoms (Copp, 1977). Female members of the family (wives, mothers) were selected for the study because in most societies it is the woman's role to nurture and provide for the health of their families, and because women were often

the healers of ancient cultures and passed from generation to generation the knowledge and practices of their healing arts (Spector, 1979).

Nonprobability sampling was used to select a sample (Polit and Hungler, 1979). This form of sampling is recognized as weak but was necessary as it was difficult to gain access to the sample. It was necessary to use a convenience sampling technique in order to obtain knowledgeable informants. Access to rural populations is difficult due to environmental factors and occupational activities at certain seasons of the year such as harvest season.

Initial preparation for selection of sample units included a visit to a naturopathic physician's office to explain the study and the desire for access to participants from the selected target area of Teton County. After approving the intent of the study and the "Human Needs Statement" the naturopath wrote an introductory letter to be sent with the "Human Needs Statement" to fifteen rural persons from Teton County. A self-addressed and stamped post card was included in a letter to the prospective interviewees. It was to be returned with indication of a preferred interview date (see example of letters in Appendix E). Three returns were produced from this mailing. One of these persons served as a pilot study informant, the second eventually became a resource person for the "snowball accidental sampling" method that was later used for the study (Polit and Hungler, 1979). The

third return stated the lady had died earlier in the year.

A second resource person was selected to assist in the "snowball sampling" process. This person was personally known by the researcher and met the designated criteria for the study. The resource persons served as "key informants" (someone who can assist an ethnographer in learning about informant's culture) (Spradley, 1979) as well as providing names of their friends, relatives, and acquaintances who also met the farm-ranch, herb and/or health food criteria. The sample selection continued until a sample (N=20) was completed. The "snowball sampling" form of selection provides convenience, but also risks sample bias (Polit and Hungler, 1979). The method proved to be a method of access to persons in a rural setting, and was especially helpful when considering the study was conducted during the busy harvest season.

A registered nurse from Teton County provided access to the Hutterite commune family that included a mother, two married and two single daughters, and grandchildren. The Hutterite sample unit called for two interview visits to clarify information due to the amount of input from several persons at once. The registered nurse resource person remained during the visits for the comfort of the participants.

The informants, rural herb and/or health food users, defined themselves as such. If people said they consumed or used herbs or health foods, they were considered to be users of herbs and/or health

foods. All the participants also had in common the characteristics that they participated in farm-ranch activities, that they thought a balanced diet important for themselves and their families, and that they at least occasionally consumed some vitamin or mineral supplement.

Procedure

Farm-ranch family members from Teton County, who use herbs and/or health food for health care were studied with the intention of ". . . seeking to build a systematic understanding . . ." of these people (Spradley, 1979, p. 10). The instrument used to study the target population and collect data was a personal interview questionnaire which was developed from two other nutritional survey tools (see Appendix F to examine the study's interview questionnaire).

The first and last part of the interview questionnaire which was concerned with personal background data and factual information was styled after the "Dietary Questionnaire for Adults and Adolescents" which was adapted from "Screening Children for Nutritional Status: Suggestions for Child Health Programs, Washington, D.C.: U.S. Government Printing Office, GPO, 1971" (Yura and Walsh, 1978, p. 54-55). The middle part of the questionnaire which concerns nutrient supplementation use was styled after the vitamin and mineral supplementation portion of the "Nutrition, Health, and Activity

Profile" of Pacific Research Systems, P. O. Box 64218, Los Angeles, California 90064 (Pelletier, 1980).

Demographic questions established the informants' age, sex, marital status, pregnancy, education level completed, occupation, income, and family members still residing in the home with ages listed for those persons. All demographic questions were answered by all the informants with the exception of the economic status question. The questionnaire included open-ended questions to elicit information in the language of the informants (Where do you usually purchase . . . ?; If purchased, what kind of . . . ?; Do you presently use multi-vitamins with minerals? Dosage? Who prescribed/recommended? Reason needed?).

Two pilot interviews were done to assess the adequacy of the instrument and to ascertain if the questions were understandable and acceptable. The first pilot interviewee was completed with a resource person from Teton County, while the second pilot interviewee was from an area just outside Teton County and was from the persons suggested by the naturopath. On the Teton County interviewee information was included in the study in order to provide consistency for the study. Both informants answered all the questions and provided answers about herb and health food consumption. It was during these interviews that it was found that to assess nutrient and herb use it was preferable to read the label of the nutrient or herbal preparation, if possible, as

well as ask the informant about its use. This method produced more accurate information about the substance, dosage, and contents as various brands of the multi-nutrient substances differed in content, combination, and potency. It was also found that an interview would take approximately one hour to one and one half hours to complete.

All appointments were arranged and confirmed by telephone. Explanation of the purpose of the study was stated during the scheduling of each interview, preceding the start of the interview, and in written form. A duplicate of the "Human Needs Statement" was given to each informant. Dates and signatures were obtained on the consent and information forms (see Appendix D). An explanation was also given for recording answers of the informants while they were responding to questions. All answers were recorded in written form only.

With the exception of the Hutterite interviews, and with the exception of one of the resource persons, only one interview visit was done per informant. From an ethnographic point of view, more visits would more thoroughly validate meanings of language, actions, and substances used. The key informants or resource persons helped to validate language and confirm some of the usage of herbs and/or health foods. The single interview was carried out for each informant.

Interviews took place in a setting chosen by the informants. This was for their convenience as the collection of the data took

place at the end of harvest season, but the home setting was encouraged whenever possibly to allow for observation of behaviors in the natural environment. With the exception of two informants, all the interviews took place in the informants' homes. One of the interviews took place in a restaurant and the other was conducted outside a health food store in the informant's car. Both were conducted in a city where participants were completing shopping needs. The lack of conformity could possibly bias the study, but the findings were similar to the rest of the sample after the informants clarified nutrient information by either mailing more nutrient content information or relating where nutrient/herb supplies were purchased. Some of the interviews were conducted in the presence of other family members for the comfort, convenience, or preference of the informants or their husbands.

Background information on specific nutrients, herbs, and USRDAs were recorded, followed by the informant's use of supplements (for clarification and identification of potential interactions and side effects of nutrients, herbs and/or drugs). Descriptions included verbatim language and observations about the rural informant, about the environment of the informant, about the informant's nutrient and herb usage, and about any other data pertinent to the study. Information recorded about herb and nutrient use indicates only the female informant's use unless otherwise indicated.

At the conclusion of the interview arrangements were made with the informants to receive an abstract of the study if they wished to do so. Arrangements were also made to provide a copy of the finished study for a period of time for the informants to read. A central location in the county was designated for this and the informants were notified they would receive dates for the time the study would be available when the abstracts were mailed to them.

The small sample was a limitation of the study since there are several hundred farm-ranch families in the county. The consistency of the informants answering similar questions and the similar findings about general use of herbs and/or health foods provides a baseline for future studies. The phenomenon of similar answers between lists of informants obtained from two different resource persons and from people from different areas of the county provides for some inference potential, however determining causal relationships was not a purpose of the study.

The harvest season posed a time limitation for the study. Persons should feel comfortable and free for more "ideal" communication and interaction. Considering this factor, an emphasis on a specific amount of time for an interview (one and one half hours) limited the amount of additional information which could be obtained.

Another limitation encountered was the difficulty of being objective and staying focused on the study's intended purposes when

health matters were addressed since the researcher was a nurse. The concepts of the nurse as a health educator and a helping figure are related to nursing and are perceived by both the nurse and the informants. These factors impose conflicts.

The focus of the study was maintained by following a regulated regime of introduction, explanation of rights and verbatim recording, and consistency in sequence of asking questions. Requesting the use of nutrient/herb containers so that labels could be read assisted in consistency and decreased the amount of time necessary to acquire that information.

Protection of Human Rights

Protection of the informant's human rights, interest, assurance of anonymity, freedom from identification, and consent to participate in the study was maintained by consent forms that were made available for the informants to read, sign, and date prior to the start of the interview. The informants were made aware they could withdraw from participation in the study at any time during the interview. The study plan was submitted and approved by the Human Subject's Review Committee prior to the start of data collection. Informants' answers were coded for anonymity, and provision has been made to destroy all identifiable data at the conclusion of the study.

Data Analysis

Data analysis began with assessment for an emergent theme, specific characteristics, behaviors, or substance use. The categorization scheme was designed to meet the theoretical, analytical, and content information goals of the study. Informants were assigned numbers to provide anonymity and for ease of recording. Questions were coded and the number of times phrases or responses occurred was counted. Information was recorded descriptively in a manner that presented general information and then specific information. Nutrient information was recorded according to the substance used, dosage, action, purpose, and repetition of substance in different preparations taken by the informant on a daily basis (see Appendix A for nutrient use). Herbal use information was similarly recorded. Illnesses, drugs taken, references used, and resources consulted were recorded for informants and family members. Averages, ranges and frequencies were used to describe data. The data analyzed and reported do not add up to 100 percent in most cases, due to patterns of usage responses, responses of "don't know" and "don't want to answer."

In the next chapter findings are described. Demographic descriptions of the sample precedes the findings related to rural families' health food and herb usage.

Chapter 4

DATA ANALYSIS

Part I: Rural Family Use of Herbs and/or Health Foods

The analysis of findings of what herbs and/or health foods Montana rural families use for preventive or therapeutic health care, is preceded by information about the target population and their environment. This background provides a perspective for understanding the families, and their nutritional and supplemental nutrition practices. Analysis of findings is based on interviews with the rural families. Background information is essential for an exploratory study that uses survey field study technique. Polit and Hungler (1978) state that collecting personal background and factual information has been shown time and time again to be related to a person's behavior.

The first portion of the data analysis provides general and then specific demographic information about the target county and the sample of twenty farm-ranch families. Comparative information on a Hutterite family will conclude the second section. The second portion of the data analysis will related the findings of what herbs/health foods the above families used for preventive and/or therapeutic health care. Baseline information on the function of vitamins, minerals, and herbs accompanies the findings about the rural participants' use of

herbs/health foods. The health food information is taken from nutrition, physiology, and pharmacology texts, as well as from medical and nutrition journals.

Background, Environmental, and Demographic Information

Teton County (population 6400, 1980), target area for this exploratory descriptive study, is located in the north central portion of the state of Montana. This county, primarily agrarian, is in District Four of the state's eight agricultural districts (Project '80, 1980). Montana's agricultural districts originated early in this century from work done by groups concerned with Montana's agricultural and rural progress. The first formal conferences and groups were formed in 1927. At that time there were only six designated districts, and one out of every three people in Montana lived on a farm. Project '80 reports that during the 1970s progress within the state and nation presented Montana agriculture with conflicts in the following areas: water use and availability; land use and development; use of chemicals in agriculture; and a role change for women. It further reported the following: (a) A farmer of the 1970s was responsible for feeding sixty people in the nation, (b) the ability to export his products was and is considered essential to the farmer's survival, and (c) domestic diets have influenced and affected

the farmer-rancher's production of grains and meats (Project '80, 1980, p. iv).

Hassinger (1976), clarifies some of the conflicts that face persons like the agrarian informants of this study. In writing about rural people and health services, Hassinger theorizes that development of agriculture from a way of life to a commercial enterprise changed relatively self sufficient agricultural units into those needing high capital, specialization, and sophisticated technology. He also related that the distinction between those who made a successful transition in the agricultural industry and those who did not was that the successful people had to adapt to large scale operations, and acquire economic and managerial skills. The large scale operations have decreased the accessibility of small scale operators and of younger persons into farming-ranching through traditional channels, thereby widening socioeconomic differences. "Often decisions are made and resources controlled outside of rural people and communities" (Hassinger, 1976, p. 164).

Agriculture has been and still is the main industry of Teton County. The farms and ranches have produced cattle, sheep, horses, and a variety of grains, despite flood, blizzards, hail, fire, depression, and present day problems such as saline seep. There are approximately 975 farms and ranches in the county. These farms and ranches employ 49 percent of those employed in the county, with what

is stated to be a stable economy. The county's average income levels are considered comparable to the state's average income levels. The average gross farm-ranch income level of the state in 1975 was \$25,000 (Teton County Situation Statement and Conservation Needs Inventory, 1975).

Swanson and Swanson (1976), contrasting farm incomes and assets with the general population related some information pertinent to the study's sample. The following information applies to this Teton County agricultural sample. The tangible assets (physical and land) of farmers are proportionately high nationally, but they have an insignificant portion of assets measured by income and cash flow. Therefore personal incomes of farmers are lower than urban populations, but not much, even when considering the nonmonetary form of farm income (Swanson and Swanson, 1976).

The farm-ranch lands of Teton County, vary from the dryland (non-irrigated) strip farming style to those farms and ranches with canal/ditch and or power (pump) irrigation systems. Some farm-ranch families have to transport drinking water from considerable distances due to soil and water contents. Some areas of the county have mineral accumulation problems in their soil. This is due to an impermeable shale rock layer that has high salt concentrations in it. Soil conditions affect the wells that are used for irrigation and drinking purposes, and during periods of high rain-water levels and/or

increased irrigation produce the saline seep problem that is prevalent in the county (Teton County Commission for Rural Development, 1975). One family of the study stated that they have their own water distiller in order to have better drinking water.

Some Teton County farmers-ranchers use pesticides to control rodents, insects, fungi, and so forth. They are required by law to be certified to use these products. This certification requires that these persons participate in regulated education programs on the properties of pesticides and their use, the equipment necessary for use, and information on their effects on health. Several of the pesticides, if not properly used, are toxic to human life.

Recertification for use is required every five years. The County Extension Agency is responsible for conducting these programs and for carrying out the necessary record keeping and updating required by the national and state pesticide laws. The use of pesticides is a concern to health food users. They fear contamination and alteration of the nutrient qualities of food. This was a concern of persons of this study and of a study done in two Texas cities by Rhee and Stubbs (1976).

Women in agriculture have been recognized for more than their homemaker roles. Through efforts of such groups as Women in Farm Economics (W.I.F.E.) women are now also credited with their

multi-farm-ranch job contributions which allows them the right to Social Security and other tax benefits.

Some farm-ranch women of Teton County are involved in the agriculturally concerned groups that influence their industry politically, economically and educationally (W.I.F.E., Cowbelles, The Porkettes). These groups and youth groups like 4-H and Future Farmers of America offer programs on nutrition and health.

Description of the Sample

All the participants were from Teton County, were Euro-American, and were from a selected group of known herb and/or health food users. Twenty farm-ranch families and comparative group of Hutterites also from Teton County participated. The families came from areas in or around four Teton County communities. The communities were listed as postal addresses by the participants. The four communities and the number of participant families from that area are as follows: nine families were from Choteau; seven were from Power; two were from Fairfield; and two were from Dutton. The rural communities that the families listed were within 34 miles (oiled pavement/interstate) of Choteau. The four communities vary in size and population. Choteau, the county seat, is the largest community of Teton County (population, 1,789). Choteau has the most established health care facilities, is a center for agricultural supplies, and has the most food facilities in

the county. The population of the other communities is less than 700 persons per community (Teton County Commission for Rural Development, 1975). Most of the residences of the farm-ranch families (19) were located out of the city limits. Only one family resided within one of the rural communities. This family was semi-retired from the farm-ranch industry.

All the female members interviewed and all their husbands, with the exception of one who had suffered a stroke, were actively involved with some agricultural activities. Their participation was on a full time basis (13 participants) or part-time basis (seven participants). Part-time participation included those families who were retired, those who kept a homeplace and leased out property, those who supplemented the farm-ranch operation with another occupation, and those who were maintaining a homeplace and assisting younger generation family members during busy times such as harvest or calving. One family was planning to move to town due to health problems of both the wife and husband. These people had leased most of their property since their illnesses.

The homes of the twenty farm-ranch wives who were interviewed housed nuclear families only. Nuclear family, for the purpose of this paper means, "the basic unit in society having as its nucleus two or more adults living together and cooperating in the care and rearing of their own or adopted children . . ." (Webster, 1970, p. 301). Neither

elderly relatives nor grandchildren were presently living in any of the homes. All but one of the twenty interviewed rural women had had children.

The size of the families presently living at the home address were as follows: eleven two member families (husbands and wives); four three member families; two five member families; two six member families; and one seven member family. Three of the women were pregnant at the time of the interview. The families had a total of 27 children presently living at home and 19 children who lived away from home. The average number of family members presently living in the homes was 2.4 persons.

The ages of the children still living at home ranged from one year to thirty years. The average age of these children was twelve and four tenths years. There were 14 children less than 15 years of age and 13 children over 15 years of age residing in the rural homes. There were 14 males and 13 female children represented in these homes.

The husbands in this rural study were between 29 and 87 years of age. The average age was 58 years.

Farm-Ranch Wives: Roles, Activities, Nutrition Practices

The ages of the 20 farm-ranch wives interviewed ranged from 27 years to 87 years. There were eleven women between 27 and 55 years of age and nine over 55 years of age. The average age of the wives was

55 years.

The formal education of these rural women ranged from completion of the seventh grade in elementary school to completion of baccalaureate degrees. Fifteen of the women had completed high school or education beyond high school. None of the women were presently enrolled in a formal education program at the time of the interview.

These women had had other life experiences beyond formal education that contributed to an increase in their education, knowledge, or skills. Some roles which provided other life experiences included teaching in elementary, high school, or special education areas, registered nurse (not currently practicing), medical technician, hospital aide, minister's wife, editor of a community newspaper, district clerk, and membership and work in groups such as W.I.F.E. (Women in Farm Economics).

All of the women were still involved in some phase of a farming or ranching business. The four women who described their status as retired or semi-retired still were active in the business. Two of these retired women reported that they and their husbands assisted extended family members in farm-ranch activities during peak work periods such as harvest time. Two of the retired or semi-retired persons were maintaining smaller farm-ranch operations and leasing out property or gradually turning the operations over to family.

Economic status of these families was asked for in approximation

of annual income and given in ranges. The economic status findings for the participants responding to this question ranged from the \$5,000-\$9,000/year level to the \$75,000-\$100,000/year level. The figures were representative of incomes after expenses. Three of the participants did not respond to the question and one woman chose to state only income she had from inherited property. This income was in addition to what she and her husband had together. The most frequent distributions were listed at the levels of \$10,000-\$15,000/year (six) and the \$20,000-\$30,000/year levels (six). There were three participants who stated incomes between \$15,000-\$20,000/year. Only one family estimated their annual income to be in the \$5,000-\$9,000/year level and this family stated they were retired. Only one family listed an income of \$75,000-\$100,000/year. More than half of those who reported incomes stated they had incomes of \$30,000/year or below. When reviewing this information it is important to note that farm-ranch incomes have greater disparities than the general population between tangible assets (physical and land) assets, and intangible assets (income and cash flow). A true economic level for these rural families can be estimated to be well above their annual income.

Economic information is desirable when considering rural health and nutrition counseling. Because economic status is sensitive, informants were not pressed to answer such questions. It was

interesting to note that it was persons who were actively involved in the farm-ranch business who declined to answer this question.

All of the women were observed to be able to be physically active in their homes. One woman stated a health reason for having to make future arrangements to move to an urban area closer to supportive family members and medical facilities for both herself and her husband.

The harvest season is a busy time for the farm-ranch wife. The season adds to her routine chores the harvesting and preservation of the family's garden produce, the chores of other family members involved in crop harvest, or sees her actively involved in the crop harvest activities. Four of the women stated that they participated in harvest activities outside of the home activities by driving grain trucks, going after parts for equipment repair, and/or transporting meals to harvest workers. At the time of an interview, the eldest female participant came in from an orchard carrying a full bucket of apples she had gathered. She also showed the researcher corn she and her husband had harvested and were drying for next year's crop. Both she and her husband made statements that demonstrated their pride at still being self-sufficient and able to maintain some of the activities of their previously more active life in agriculture. They, like many other participants, were proud of their efforts in the production of food for themselves and others. In their conversations

during, preceding, and following the formal interview session they verbalized knowledge about the benefits that balanced diet and exercise have in maintaining health. They were convinced that their approach to nutrition left them "feeling good."

All 20 rural women expressed the concern that their families have wholesome food. All but two of the participants responded to this concern by raising their own gardens, canning, freezing, and/or dehydrating their own garden products, and when purchasing food used as much fresh and chemically untreated food as possible. The production of garden products was a cooperative effort by the family members and even between some of the rural neighbors. Some neighbors raised gardens together to conserve water. One woman stated her husband had made their own food dehydrator. Another family has built a pyramid shaped greenhouse to produce fresh food longer and to try the pyramid energy theory in growing plants. Garden and fruit products were dehydrated to send back to college with the college aged children to insure meeting their nutritional needs while away from home. Six women specifically commented on encouraging their children's use of natural foods, such as fruits and vegetables for snacks rather than the commercial snack treats that are high in fat or refined sugar.

Emphasis was placed on the importance of using produce without artificial treatment whether for fertilization, pest control,

preservation, or coloring. Three families reported they did not use pesticides or chemical treatment on their crops. One stated that they used only herbicides on their crops. Three women stated they purchased only fruits and vegetables they knew to be grown without chemical treatment. One family went to Idaho to an area where fruit is grown without commercial chemical treatment and brought a truck load to sell to neighbors who wished the same kind of untreated produce. One woman reported that she rinsed all her store bought fresh vegetables and fruits in chlorox water before using. When questioned about this practice she stated, "Why be embalmed before you are dead?" All of the women stated they preferred to prepare and eat food without preservatives, but five or six of the women stated because of family preferences, seasonal, and convenience reasons they did not always do this.

The majority of families not only had gardens, but 18 reported they either raised their own beef or purchased beef for their families from neighbors. The majority of these people preferred the organically raised beef. This is beef that is grass or range fed and not force fed with hormone or chemically treated grains and feeds that increase weight gain and growth of the animals. Five families stated they also raised their own pigs for their own use and to sell. Similarly, six to seven families reported that they raised chickens for meat and eggs. One family stated that they raised their own beef,

pigs, chickens, turkeys, and geese. Another family stated they also used fish from their own reservoir for protein needs.

Nine of the women stated that they baked all or most of their own bread and used only whole wheat flour that they ground themselves or purchased from sources who do. One woman stated that she used her own whole wheat in place of rice in cooking. Some women mentioned that they purchased whole wheat bread from a store in a larger city that is more than 50 miles from their home in order to get the stone ground wheat bread. The rationale they gave for using the whole wheat almost exclusively was that it tasted better and was "better for you" nutritionally.

Six families used unpasteurized milk either from their own cows or from neighbors. They stated that it was more nutritious and healthier than pasteurized milk. Two women also stated that the cows and milk were tested periodically for disease.

Sixteen women reported that they used honey in place of sugar whenever possible. Three stated they canned with honey in place of refined sugar. They also either raised their own bees for honey or purchased it from neighbors who raise their own bees. The reasons given for this practice was better tasting, a family tradition, or reading or hearing that it was nutritionally better for one than refined sugar.

Participants stated they had read that too much refined sugar had

a bad effect on health. One woman stated that she purchased a special fructose product to use in place of refined sugar. The use of sugar or high carbohydrate products was a stated concern of the majority of these women. The reasons they reported for this concern were as follows: "My husband has a family history of diabetes;" "If my son eats alot of sweets he gets hyperactive" (this woman noted a difference in his behavior on days when koolaide-like drinks were served in school as opposed to days when milk or fruit juice was served. The grandparents of this child also noticed a marked change in the child's behavior at a basketball game after they allowed him to eat high sugar and calorie treats); "My grandson has an intolerance to sugar;" "If I eat food with refined sugar, I ache" (this person stated she had arthritis).

There was one lacto-ova-vegetarian (includes eggs and dairy products in a vegetarian diet) among the participants. This person's food habits were influenced by her early family practices (she was born in a South American country), by her past health history and that of her family, and by reading. This woman used home grown vegetables, fresh and dried fruit, seeds, nuts, whole wheat grain, raw milk, eggs, and yogurt to meet nutrient requirements.

Part II: Rural Family Use of Herbs and/or Health Foods

Health foods are being used in nutrition and supernutrition programs for preventive and therapeutic health care. Some rural Montana families are using herbs and/or health foods to prevent illnesses and to alleviate present ailments. Characteristics of 20 rural Teton County family members who confirmed their use of supplemental vitamins and minerals and/or use of herbs for health precede this section.

Information in this section will include background information about the vitamins, minerals, and herbs that the participants used. The information on the specific nutrients include the function of the nutrient in the human body, information on how a deficiency or excess of the nutrient effects the body, as well as drugs that interfere with the function of the nutrient in the body. The participants' use of a specific nutrient is listed at the conclusion of each nutrient's background information. Information about what prescribed medications the participants took and information about what sources of reference the participants used to gain information about herbs and health foods is included. Information on the nutrients is taken from the areas of nutrition (Williams, 1969; Block, 1981), medical physiology (Guyton, 1981), pharmacology (Bergerson, 1976; Rodman and Smith, 1979; Nursing 80, 1979), and other nutrition or health publications as indicated

below. Comparative information on the Hutterite portion of the sample concludes the chapter.

The interview questionnaire used for the study can be examined in Appendix F. Definition of terms for herbs and/or health foods not previously listed in the preceding sections of the study can be found in Appendix G.

General Information: Vitamins and Minerals

Vitamins and minerals have a variety of terms used to define them in nutrition and pharmaceutical literature. As nutrients they are referred to broadly as vitamins and minerals, for specific usage or classification such terms as electrolytes, fat soluble vitamins, organic or inorganic substances may be used. For the purposes of this study they will be considered collectively as nutrients or substances for the dynamic systems and functions of man. Singly, a vitamin or mineral will be considered as it contributes to the enrichment or dysfunction of the systems of man.

Nutrition and pharmacology sources state that most persons do not need to take therapeutic vitamin or multivitamin preparations if diets are adequate and body functions are normal (Williams, 1969; Block, 1981; Bergerson, 1976; Rodman, 1979). An adequate and varied diet will supply all the nutrient needs of the body except during pregnancy and increased growth processes such as infancy and/or adolescence.

Vitamins are required by the human body for the proper metabolism of the cells, for growth processes, and for the maintenance of health. Except for the vitamins K, D, and B₃, which are synthesized in the body, most vitamins must be ingested regularly in food products to supply human needs. Only the fat-soluble vitamins A, D, E, and K are stored in the liver and fatty tissue for any significant length of time. This requires the daily intake of the other essential vitamins such as the water soluble vitamins. Only small amounts of vitamins are necessary for normal body growth and maintenance. Vitamin deficiency (avitaminosis) occurs when diets are restricted as a result of poverty, cultural, or idiosyncratic beliefs, when the absorption of nutrients are interfered with in the gastrointestinal tract, and when there has been prolonged chronic illness, alcoholism, or other stress conditions that decrease the appetite and intake of food. Excess amounts of vitamins (hypervitaminosis) can also cause disorders of the body's functions and illnesses.

Minerals are essential nutrients for the metabolic processes in man. These inorganic elements function in human metabolism as activators, regulators, transmitters, and controllers. Minerals are classified according to their amount of presence and their function in human metabolism. Classifications found to be used are major minerals, minerals with functions known or unknown, and electrolytes. The excess or deficiency of minerals in man can affect the state of

man's health. It is recommended that intakes should not persistently exceed the upper levels of the USRDAs since most minerals and trace mineral are toxic in high concentrations (Nutrition & the M.D., Feb., 1980).

High potency nutrients are those substances with dosages above the USRDAs or approach megatherapy dosages which were defined in the review of literature. "Supernutrition" levels such as those recommended by Passwater (1975), which are also referred to as megadose or megavitamin therapy are not uncommon in supernutrition programs that promote supplementation of nutrients.

The following information will give some brief descriptions about the nutrients which were primarily used supplementally by the participants of the study. Included in the information will be the frequency of nutrient use by the participants and the dosages they used above USRDAs.

Supplemental Nutrient Use by Rural Family Members

In answer to the question of what supplemental nutrients were used the following information was obtained.

Multi-vitamins with minerals were used by 15 participants, and eight of these participants purchased two different kinds of multi-nutrient preparations. The participants who purchased two or more kinds of these multi-nutrient preparations used them for another

member of the family, or used two kinds for themselves (four of the participants used two multi-nutrient preparations for individual use). Other than the vitamins prescribed by physicians for two of the three pregnant participants, the multi-vitamin preparations with or without minerals for the majority contained high potency dosages of vitamins.

Three of the participants used a preparation that contained only multi-vitamins. Fifteen women used preparations with only multi-minerals. Four of the fifteen participants took two kinds of the preparations together. Six women also took lecithin, a preparation that repeats most of the minerals. The multi-mineral preparations usually contained the minerals calcium (found in the preparations of 13 participants), magnesium (found in the preparations of nine of the participants), and phosphorus (found in the preparations of nine of the participants). Other minerals included in the preparations were potassium, manganese, and zinc.

Vitamin B Complex preparations were taken by 15 participants. Thirteen of these women also took additional preparations such as multi-vitamin preparations that repeated the B Complex vitamins (see Appendix A, Tables 1 and 2, for participants use of specific nutrients, use of nutrients over the USRDAs, and number of participants who used more than one preparation of a nutrient).

Use of Water Soluble Vitamins

Vitamin B₁

Vitamin B₁ (thiamine, the anti-neuritic or anti-beriberi vitamin) is needed for carbohydrate and energy metabolism. It functions as a coenzyme in the body (thiamine pyro-phosphate, which functions as cocarboxylase). The vitamin is found in all body tissues, but mainly in the liver. There are some major factors that influence thiamine requirements. High energy expenditures of thiamine occur during growth periods (infancy through adolescence), pregnancy, lactation, infections, and fevers. Thiamine is also required for bodies with large tissue mass. Daily balanced diets of the basic four, plus the use of whole or enriched grains and meats, help supply the needed amount of thiamine in the diet. Use of tea, antacids, and alcohol are known to decrease the action of thiamine in the diet and with prolonged use could cause deficiency states. Deficiency of thiamine can cause multiple symptoms or conditions of the gastrointestinal system (indigestion, constipation, hypochlorhydria), the nervous system (polyneuritis and paralysis), and the cardiovascular system (cardiac failure, peripheral vasodilation) (Williams, 1969). No known toxic side effects from excess levels of the vitamin were noted.

Findings. Vitamin B₁ was taken in some type of supplement preparation by eighteen of the participants. Fourteen of these women took dosages well over USRDA and eight of these women had repeats of

this vitamin in dosages over USRDA. One person took the vitamin with a dosage that was listed as 5000 percent above USRDA; five others took preparations labeled as 3000 percent above RDAs and seven took dosages 2000 percent above RDAs. Three persons stated they or members of their family took extra thiamine during mosquito season as a mosquito retardant.

Vitamin B₂

Vitamin B₂ (riboflavin) functions as a coenzyme in protein metabolism. It also influences the tissue respiration system (carries hydrogen) when it combines with phosphoric acid in the body. This vitamin essentially helps wound healing, the integrity of mucous membranes of the mouth and nose, and tissues of the tongue, eyes, and skin (Williams, 1969). Toxic reactions to large doses of riboflavin are not known deficiencies and are not proven to be as severe in humans as in animals. Symptoms in animals are similar to those of niacin deficiency (Guyton, 1981). Increases of riboflavin are needed when one is exposed to boric acid through drugs or the environment. Excess levels of riboflavin interfere with methotrexate, an anti-cancer agent (Brin, 1976).

Findings. Nineteen women took preparations with vitamin B₂. Seventeen women took dosages over USRDAs, and eight women had from two to five repeats of this vitamin in other preparations they were

taking. Labels of the preparations read percentages of USRDAs similar to those found in thiamine above.

Vitamin B₅

Vitamin B₅ (niacin - nicotinic acid) is called the anti-pellegra nutrient. There are two forms of niacin, one is nicotinic acid and the other is nicotinamide which is formed when niacin (nicotinic acid) is converted to an amide form. Niacin and riboflavin work together as coenzymes converting proteins and fats to glucose or oxidizing glucose to be released as energy. Niacin deficiency presents symptoms of weakness, lassitude, anorexia, indigestion and skin eruptions. The skin and nervous systems are affected in deficiency states. The skin of a niacin deficient individual is especially sensitive to the sun, producing dark scale dermatitis. Nervous system involvement produces confusion, apathy, disorientation, and neuritis. Meat is the major source of this nutrient in the diet (Williams, 1969). Large doses over a period of time can cause liver damage, aggravate existing ulcers, or cause gastritis symptoms, and interfere with sugar metabolism (Graedon, 1980).

Findings. Nineteen women took this vitamin. Ten took doses well over USRDAs and nine had repeats of the nutrient in other nutrient preparations. One informant took a 25,000 percent USRDA and two informants had dosages of 250 percent USRDA. Some of these women had

three repeats of niacin in their supplementation preparations.

Vitamin B₆

Vitamin B₆ (pyridoxine - pyridoxal phosphate and pyridoxamine) works physiologically as a coenzyme in protein, carbohydrate, and fat metabolism by the following processes: (a) decarbolization in the nervous system to regulate neurons and stimulate cerebral activity and brain metabolism; (b) deamination rendering carbon residues available for energy; (c) transamination to form amino acids; (d) transsulfuation of sulfur from one amino acid to another; (e) nicotinic acid formation of tryptophan; (f) amino acids formation into "heme" of hemoglobin; (g) absorpction of amino acids in intestinal wall and their entry into cells (Williams, 1969; Guyton, 1981). Prolonged deficiency of this vitamin causes hypochromic megocytic anemia and central nervous system disturbances (hyper-irritability and seizures in children). Drugs such as INH (isonicotinic acid), levodopa, some antidepressants, estrogens (oral contraceptives), alcohol, and hydralazine inhibit or deplete vitamin B₆ in the body. No known toxic side effects were listed.

Findings. Twenty of the women used a vitamin B₆ preparation. Fourteen took doses over USRDAs and nine had from two to three repeats of the vitamin. Three women took preparations marked 2,500 percent over USRDA and five took 3,000 percent over USRDA of vitamin B₆.

Vitamin B₉

Vitamin B₉ (folic acid - pteroylglutamic acid) is an antianemic conjugated substance made up of three acids, one of which is glutamic acid, an amino acid. Its function in the body is coenzymatic in carbon transfer and it participates in the formation of key compounds such as the purines (essential to all living cells), thymine (forms part of DNA) and "heme" in hemoglobin. Deficiency of folic acid results in a megaloblastic anemia (infants), macrocytic anemia of pregnancy, and sprue (a gastrointestinal disorder). Increased levels of folic acid can mask vitamin B₁₂ deficiency and/or bind it into ineffectiveness (Guyton, 1981). Excess levels or allergic side effects of the vitamin cause skin reactions (rash, pruritus, erythema) and allergic bronchospasms and general malaise (Nursing 80, 1979).

Findings. Fifteen women took preparations with vitamin B₉. Three women had single dosages above USRDA and one had repeats of this vitamin in other preparations.

Vitamin B₁₂

Vitamin B₁₂ (cobalamin) is the only known vitamin that combines with cobalt. Several different compounds of cobalamin exhibit vitamin B₁₂ activity (Guyton, 1981). The vitamin functions as a hydrogen acceptor coenzyme. The coenzyme performs several metabolic functions. Among the most important of its functions is its action of reducing

ribonucleotides to deoxyribonucleotides, a step in the formation of genes. Two other related functions this vitamin has are the promotion of body growth and of red blood cells maturation (Guyton, 1981). Rather than a deficiency due to low or decreased nutrition, vitamin B₁₂ deficiency more often arises from lack of the intrinsic factor. The intrinsic factor (a mucoprotein) must be secreted by the parietal cells of the gastric glands so that the vitamin can be absorbed by the ileal mucosa (Guyton, 1981). Side effects of toxic levels of the vitamin cause peripheral vascular thrombosis, transient diarrhea, and skin disorders (itching, exanthema, urticaria) (Nursing 80, 1979).

Findings. Seventeen women took preparations with vitamin B₁₂ in them. Twelve took dosages over USRDAs and nine of these women had repeats of the nutrient in other vitamin preparations they were taking. Four women took preparations listed as 1000 percent above USRDA.

Vitamin C

Vitamin C (ascorbic acid) is a water soluble vitamin that is essential for many oxidation reactions in the body. Vitamin C helps in the formation of collagen substances, an essential product for the growth of subcutaneous tissue, cartilage, and bone. The vitamin reacts, in as yet some unknown way, with iron and copper at cellular levels which allows their use in body fluids. Vitamin C also

increases the effect of folic acid in some metabolic processes (Guyton, 1979). Physiologically, the vitamin helps in the maintenance of intercellular substances in the body and potentiates the integrity of cell membranes via an intracellular cement substance. Deficiency of vitamin C causes scurvy symptoms which are decreased wound healing, decreased to cessation of bone growth, blood vessel wall fragility that produces hemorrhages under the skin and in some instances muscle cell breakup (Guyton, 1981). Vitamin C deficiency can decrease the metabolism of some drugs such as anti-psychotic medications and some environmental chemical substances. Likewise, this vitamin can be inhibited or blocked from use in the body by such drugs or environmental chemicals as aspirin, oral contraceptives, nitrites, and smoking (Brin, 1976). Vitamin C can also be destroyed by oxygen, alkalis, and high temperatures. Megadoses of vitamin C have been known to cause or increase the incidence of kidney stones in susceptible persons (Herbert et al., 1978).

Findings. Nineteen women took vitamin C preparations. Eighteen informants took doses over USRDAs, and four took two or more preparations in dosages over USRDAs. The dosages that were listed over USRDAs ranged from 150 percent to 21,000 percent above USRDAs.

Other Water Soluble Vitamins

Pantothenic Acid

Pantothenic Acid is present in all tissues of the body. It functions in the body as coenzyme A and assists in the metabolism of both carbohydrate, protein, and fat, and assists in the formation of acetylcholine, a neuro-hormone. Some pantothenic acid is synthesized by intestinal bacteria. This nutrient is present in all types of foods.

Findings. Fifteen women took preparations containing pantothenic acid. Eleven women took the nutrient in dosages over USRDA, and seven of the women had repeats of the vitamin on other supplements they were taking. Some of the preparations were noted to be 250 percent above USRDA.

Para-Aminobenzoic Acid

Para-aminobenzoic acid (PABA) is not a real vitamin, but is a structural unit of folic acid. It is an essential component of folic acid formation. PABA has been found to be effective in decreasing rickettsial diseases through its blockage of the rickettsial microorganisms; essential metabolites. This substance is also used in sun screens and lotions to prevent burning and permit tanning (Rodman and Smith, 1979).

Findings. Ten women took this nutrient, and nine of these used

dosages over USRDAs. There were no repeats of this nutrient.

Biotin

Biotin (vitamin H) functions as a coenzyme in carbon dioxide fixation processes in the body. The processes include the syntheses of some fatty acids, conversions for synthesis of some amino acids, and the carbon dioxide fixation in the formation of purines. Biotin also works coenzymatically in the deamination process for aspartic acid, serine, and threonine (amino acids). A strict egg diet has been known to bind biotin and prevent its absorption in the intestine (Bergerson, 1976).

Findings. Thirteen women took preparations with this nutrient in them. None of the women used dosages over USRDAs; two had the substance repeated in supplements they were taking.

The Pseudo-Vitamins

Inositol

Inositol is like glucose in composition. It was found to be so in relation to diabetics who excrete more inositol in urine than non-diabetics. The substance is stored in muscle tissue (heart and skeletal), in the brain, and eye tissue, and in some red blood cells. There is some evidence of a lipotropic (decrease fat deposits) effect especially in animals, but its true value in humans is still undetermined (Williams, 1969; Bergerson, 1976).

Findings. Thirteen women had inositol in their supplements.

None of the dosages exceeded USRDAs. Two women had repeats of the substance in other supplements they were taking.

Choline

Choline is not a true vitamin but is classified as a phospholipid, a fatty acid, and a lipotropic agent. Choline is manufactured by the body and is used in larger amounts in the body than vitamins. It is related to protein metabolism and two fat retarding products, lecithin (a phospholipid important in metabolism of fat by the liver) and sphingomyelin (a phospholipid in the brain and nerve tissue). Choline combines with acetylcoenzyme A to form acetylcholine, a mediator in nerve activity (neurohormone). Research has found that it may be this action that allows choline when used in supplementation to be helpful to some patients with neurological and memory disorders. Choline is believed to pass the blood brain barrier and quickly convert to acetylcholine, a factor possibly lacking in the neurological and memory deficient persons discussed above. There is no known side effect of this substance's use supplementally other than a fishy body odor in some persons (Williams, 1969; Bergerson, 1976).

Findings. Fifteen women took choline in their supplements.

Three had dosages over USRDAs, and six women had repeats of the substance through their also taking lecithin preparations. The

lecithin preparations also contained other nutrients such as calcium, iron, magnesium, phosphorus, manganese, and vitamin E. Lecithin changes into a glycerol and further into phosphoric acid and choline in the metabolism process.

Fat Soluble Vitamins

The vitamins A, D, E, and K are essential food factors as are the water soluble vitamins mentioned above. They essentially work as coenzymes in a variety of metabolic processes within the body. These vitamins, however, are stored in the body in body fat, muscles, and liver, and require the presence of adequate amounts of digestible fat and bile salts in the intestines to be absorbed and utilized within the body. In toxic amounts or in cases of lack of efficient excretory mechanisms the vitamins can cause serious side effects within the body. Because these vitamins are stored in the body and utilized in minute amounts in the various metabolic processes of the body, there is little danger of deficiency even during periods of dietary deficiency (Williams, 1969; Block, 1981; Guyton, 1981; Bergerson, 1976).

Vitamin A

Vitamin A (retinol): Retinol, an alcohol in chemical structure, is the vitamin A substance that occurs in animal tissues. The provitamin substances present in vegetable tissues known as yellow and red carotenoid pigments can be changed into vitamin A by the liver.

Substances that aid in the absorption of vitamin A are bile salts (help stabilize the vitamin), pancreatic lipase (hydrolyses the fat or oil form of the vitamin), and fat (required in the intestines to assist absorption of the vitamin by the large intestine). The full function of vitamin A in metabolism other than for formation of retinol pigments is not known but the lack of the vitamin affects the skin's integrity and structure, affects growth in young animals, affects reproductive organs of males and females, and causes corneal opacity and blindness. Vitamin A is known as an "anti-infection" vitamin because deficiency of it produces epithelial damage in the eyes, kidneys, and respiratory tract.

The use of mineral oil can interfere with absorption of both vitamins A and D. Taking mineral oil one half to one hour after meals decreases the potential for malabsorption of the vitamins (Williams, 1969).

Drugs and chemicals such as polychlorobiphenyls (PCB), benzoprene, spirono-lactone and DDT increase the needs for vitamin A in animals and man (Brin, 1976). Overdose (hypervitaminosis) of vitamin A is categorized as acute and chronic. Chronic toxicity symptoms are joint pain, thickening of long bones, loss of hair, and jaundice (Breslan, 1975). Acute hypervitaminosis A produces symptoms of drowsiness, irritability, headache, vomiting, and high serum vitamin A levels (Hathcock, 1976). These are but a few of the

symptoms caused in the adult. Infants are found to be more sensitive to the vitamin in both acute and chronic toxicities. Transient hydrocephalus has been seen in infants (Hathcock, 1976). Jarvis (1981) reports other infant side effects as seen in the review of literature section of the study.

Findings. Seventeen women took vitamin A in some preparation. Eleven of these women had dosages that exceeded USRDAs; four of these women had vitamin A repeated in dosages over USRDA in other supplements they were taking. One dosage taken was listed as 50,000 IU, and two had dosages listed as 35,000 IU.

Vitamin D

Vitamin D (natural cholecalciferol) is now identified as a group of sterols. The fat soluble vitamin increases calcium and phosphorus absorption (by active transport) from the gastrointestinal tract, and helps regulate the deposit of calcium in the bones. Vitamin D enters the body via the sun and its ultraviolet radiation of the 7-dehydrocholesterol substance in the skin. Synthetic vitamin D, "ergocalciferol," is formed by irradiation of ergosterol. This is the vitamin D supplement that is added to milk and other foods. Overdoses of vitamin D can result in the calcification of soft tissue (lungs and kidneys), bone, fragility, and symptoms of weakness, lethargy, anorexia, and constipation. Fatalities from impaired renal

function have been documented (Rodman and Smith, 1979). Although of rare occurrence, it is possible to overdose an infant using vitamin D fortified formula and cereal plus a vitamin D supplement. The condition is known as "idiopathic hypercalcemia" (Committee on Nutritional Misinformation, National Academy of Sciences, 1981). Vitamin D levels can be diminished with the use of anticonvulsants and the use of mineral oil with meals. One half to one hour intervals after meals is recommended for taking the above mentioned vitamin D inhibiting drugs.

Findings. Eighteen women used vitamin D in some supplemental form. Four women took dosages over USRDAs and three of these women had the vitamin repeated two or three times in preparations they were taking.

Vitamin E

Vitamin E (tocopherol) chemically is an alcohol factor. This vitamin has gained recognition in the past as an anti-sterility substance, and anti-muscular dystrophy agent, and for its improvement in peripheral vascular disorders in animals. As yet there is little documentation that these same results occur in man. In humans, the vitamin is absorbed through bile salts and fats and is stored mainly in adipose tissue. It prevents the oxidation of unsaturated fats, vitamin A, and the carotenes. There is the possibility that vitamin E

is also involved in some enzymatic reactions (Nutrition & the M.D., February, 1980). Vitamin E is relatively non-toxic in man, however as with other fat soluble vitamins megadose consumption for long periods of time is not recommended. Undesirable toxic effects in humans noted have been general muscular weakness, increased urinary creatinine and elevated phosphokinase (Nutrition & the M.D., February, 1980).

Findings. Twenty of the participants took vitamin E in some supplemental preparation. Nine of these women had dosages over USRDAs, and seven women had vitamin E repeated in two to three different supplements they were taking.

Vitamin K

Vitamin K is actually a group of substances with similar biological activities. Vitamin K₁ (phylloquinone or phytonadione) and K₂ (farnoquinone) occur in nature. K₁ has been isolated from alfalfa and K₂ from putrefied sardine meal. Vitamin K₃ is made synthetically and is used clinically. Menadione, Hykinone, Mephyton, and Synkavite are some of the synthetic preparations that are included under K₃. All but mephyton are water soluble. The natural vitamin is fat soluble and requires the presence of bile in the intestine to insure adequate absorption. The vitamin is found widely in food and is also synthesized by intestinal bacteria, so it is rarely deficient in the human body except in the newborn whose intestines are sterile until

three to four days following birth when intestinal flora develop. Vitamin K is needed as a catalyst in the synthesis of prothrombin in the liver. It acts as a catalyst, an enzyme or coenzyme in the vital blood clotting processes in the body. Conditions that cause improper absorption of the vitamin such as obstructive biliary disease or liver disease can lead to hemorrhagic conditions. Antibiotic therapy (decrease the normal bacterial flora) and anticoagulant therapy (heparin, Dicumarol) counteract or interfere with the action of the vitamin. Toxic levels of the vitamin cause hyperbilirubinemia, hemolytic anemia in infants, cyanosis, dizziness, convulsive movement, nausea, vomiting, bronchospasms, dyspnea, cramp-like pain and anaphylaxis reactions (Nursing 80, 1979).

Findings. Vitamin K was not found in any preparation taken singly by the participants. Only five of the women had multivitamin preparations that included the vitamin. Eleven women were taking alfalfa tablets or alfalfa tea preparations which contain the vitamins A, C, D, E, and K as well as the minerals calcium, potassium, iron and phosphorus (Rose, 1980; Schauenberg and Paris, 1977).

Major Minerals

Calcium

Calcium is the mineral present in the largest amounts in the human body due to its major function in the structure, maintenance,

and restoration of the skeletal and dental systems. The body functions dynamically to support a state of balance for this mineral within the body. This balance is accomplished by various systems of the body such as the intestinal system (absorption and excretion), renal (adjustment and excretion), bone (storage), and hormone (parathyroid controls its levels for homeostasis). Calcium functions physiologically to build and maintain skeletal system tissue by two cellular processes. These are the process of the osteoblasts which form new bone matrix and the process of osteoclasts that absorb bone tissue by phagocytizing and digesting minute bone crystals (Williams, 1969). Other physiological functions of calcium include bonding with fibrin molecules to assist the life preserving blood clotting mechanisms, initiating muscle contraction by interacting along with other elements (magnesium and potassium) and the myofibril contractile units of muscle tissue, and allowing nerve transmission by acetylcholine, a nerve excitatory substance to move from the extracellular neuromuscular nerve junctions to the tips of nerve branches to excite muscle fibers. Calcium controls fluid by affecting the intercellular cement substances that allow fluids to pass through the cell walls. Calcium ions also play a role in enzyme activation in areas such as release of energy for muscle contraction and for the protein-splitting system.

Calcium's use can be inhibited by high phosphorus levels which

can cause tetany (severe muscle contractions and pain). Deficiency of calcium will result in tetany also. Decrease of vitamin D can affect calcium's use in bone formation and storage. Increases of calcium in the diet may be a factor in the formation of renal calculi as increased amounts of calcium in the system are excreted in the urine. Conditions of immobilization for extended periods of time (permanent or temporary disabilities) cause increased absorption of calcium from the bones into the blood stream to give rise to potential build up of calculi formation. The parathyroid hormone level in excess or deficiency affects the entire body's metabolic potentials for both calcium and phosphorus as do neoplasms. Dietary substances high in calcium, calcium containing medications (laxatives, antacids) inhibit absorption of drugs such as the tetracyclines. Diuretic therapy (thiazides) increase the calcium levels within the body (Williams, 1969; Bergerson, 1976).

Findings. Nineteen women took preparations with this mineral in them. Five women took single dosages in excess of USRDAs and ten women took two to three additional preparations that included calcium.

Phosphorus

Phosphorus is an anion associated with intracellular fluids. This mineral is closely associated in nutrition with calcium, in food sources, in bone building, in vitamin D absorption regulation by the

parathyroid hormone, and in ratio parameters within blood serum. Due to the similarities between calcium and phosphorus and for the sake of brevity, only the unique properties and processes of phosphorus will be summarized.

Phosphorus is more efficiently absorbed than calcium, vitamin D enhances but is not required for its absorption. Excess minerals such as calcium, aluminum, and iron bind it and inhibit its absorption. The major role and function of phosphorus in the human body is in the mineralization of the skeletal and dental systems. It is present in some amount in every living cell. Beyond its role in skeletal structure, it allows absorption of glucose and glycerol products by the intestine as well as reabsorption by the renal tube, in a process called phosphorylation. Phosphorus combines with fats (phospholipids) and allows transport of fats. Combining with protein substances such as DNA and as phosphatides it assists enzymatically in glucose oxidation and energy production. Phosphorus also has a role in the buffer system of acid-base balance in the blood (Williams, 1969).

Phosphorus performs metabolically to increase growth in children as well as assisting in recovery of diabetic acidosis. Deficiency states or conditions (sprue, celiac disease, increased calcium levels, hyperparathyroidism) that block phosphorus absorption produce rickets or osteomalacia symptoms and muscle weakness. Excessive amounts of phosphorus in the blood inhibits calcium and produces tetany. In

amounts beyond metabolic balance phosphate salts can cause acute renal failure and myocardial infarction (Bergerson, 1976).

Findings. Thirteen women used preparations with phosphorus, three of them in single dosages over USRDAs. Five women used products that repeated the mineral supplementation two to four times.

Magnesium

Magnesium works with the minerals calcium and phosphorus in the formation of bone salts. It is distributed in soft tissues (muscles) and body tissue and is more predominant in red cells than plasma. Magnesium is needed in balance for vascular and smooth muscle action as well as neuromuscular activity. Magnesium absorption is affected by factors similar to calcium except for vitamin D which does not affect it. The functions of magnesium include the following: It acts as an activator (enzymatically) for glucose oxidation (oxidative phosphorylation); coenzymatically, it affects protein syntheses in the cell ribosomes; and it functions with other molecules in growth and tissue maintenance processes. Phosphorus blood levels are regulated by the interaction of cortisone and magnesium. Deficiency states of magnesium affect the nervous and neuromuscular systems causing jerking, coarse and flapping tremors, and tetany. Deficiencies also cause tachycardia, hypertension, and vasomotor changes. Aldosterone drugs can deplete the food levels of magnesium. Excessive magnesium

levels can cause depression of the central nervous system which produces sedation, confusion, muscle weakness, hypotension, and even death from respiratory muscle paralysis (Bergerson, 1976). Excess levels of magnesium can also cause abdominal cramping, nausea, fluid and electrolyte disturbances which are those symptoms found in over use of laxatives containing magnesium salts (Nursing 80, 1979).

Findings. Sixteen women had magnesium in their supplements. One participant took a dosage seven times above the USRDAs in a single preparation. Three women had the mineral repeated in other nutrient preparations.

Potassium

Potassium works via the active transport system with sodium to maintain the fluid balance system of the body. Potassium is primarily found intracellularly, but its smaller extracellular amounts have significant effects on certain tissues such as the muscle tissue of the heart. The body uses potassium sparingly. Small amounts are released in the feces, but its main excretory route is in urine. Potassium retention or excretion is dependent on acid-base balances of the body, as well as the levels of aldosterone and other adrenal cortex hormones. Potassium works metabolically to maintain osmotic pressures and water balance and to support the integrity of cellular fluid. This allows glucose oxidation and energy production by the

cells. The balanced processes allow the regulation of neuromuscular activities (excitability, stimulation, transmission of impulses and contraction of muscle fibers). Potassium is involved in carbohydrate metabolism and is stored with glycogen. Diabetic acidosis and its insulin therapy call upon these stores and depletes serum and intracellular stores of potassium (ketosis). Potassium is necessary for protein synthesis which allows storage of nitrogen in muscle protein. Conditions that deplete muscle stores (diabetes), excessive gastrointestinal depletion, malnutrition, and continuous use of diuretics cause hypokalemia (deficient serum potassium) (Williams, 1969; Guyton, 1981). In depleted blood serum conditions myocardial tissue is made more sensitive to digitalis drugs and can exhibit toxic effects (irregular contractions and/or heart failure). Excesses of serum potassium (hyperkalemia) affects the heart muscle (weakening action) and neuromuscular system (weakened respiratory muscles, numbness of the extremities) and it can cause confusion (Bergerson, 1976).

Findings. Seven participants took preparations with potassium in them. There were no overdosages and no repeats. Four of the women took physician prescribed potassium because they were on diuretics or potassium depleting drugs. They all knew why the drug was needed.

Trace Minerals Used By Participants

Iron

Iron is an important trace element found in four main forms in its roles in metabolic function. It has essential roles in transport of oxygen via "heme" in the red blood cells and in normal tissue respiration. Iron has a unique absorption, transport, storage, and excretion system. Through this system it is not excreted primarily from the urine as other plasma constituents are. Small amounts of ingested iron are absorbed by the stomach and duodenum and the rest (70-90 percent) is eliminated in the feces. Iron's absorption is dependent on its level in body tissues; the presence of reducing substances in the digestive system (vitamin C); the acid medium provided in gastric secretions (HCl) that prepares iron products for metabolic utilization; and binding agents such as calcium that combine with phosphate and phytate (iron inhibitors) so that iron can be absorbed. Iron is transported to the portal blood system via mucosal ferritin and converted to the ferron state by oxidation. Plasma transports iron to cells for storage and use.

Iron is used by cells in enzymatic actions that produce energy. Iron is stored in the red blood cell forming organs of the liver, spleen, and bone marrow. It is from these organs that iron is called upon for hemoglobin synthesis. As red blood cells are destroyed, 90 percent of the iron is released and conserved to be used over again.

Excretion of iron is primarily accomplished following the ingestion of food and initial absorption via the feces and not following other metabolic processes. Females lose iron during menstruation, pregnancy, and delivery. Other possibly losses of iron are due to hemorrhage such as obvious soft and hard tissue trauma, or by hidden hemorrhage such as silent ulcers and tumors.

Iron taken in the form of salts acts as an irritant and astringent reacting with tissue protein to form an insoluble compound. Side effects can be nausea, vomiting, constipation, or diarrhea. Prolonged iron toxicity can cause skin pigmentation, hepatomegaly, diabetes, cardiac abnormalities, endocrine changes and arthropathy (Campbell, 1981). Unless blood levels of iron stores are low, an increase of iron does not have the tonic effect it has when given for nutritional anemias and iron deficiency conditions. Iron deficiency can arise when factors necessary to form hemoglobin are missing such as decreased vitamin B₁₂, a lack of hydrochloric acid, or iron inhibitors are present during absorption.

Findings. Only three of the fourteen women who used iron supplements had iron in dosages over the USRDAs. Three participants had repeats in the normal dosage levels in two supplement products they were taking.

Manganese

Manganese is a nutrient that acts by activating, stimulating, and strengthening metabolic processes. Minute amounts of manganese are absorbed for use by the small intestine. It then enters the blood and binds loosely with protein. This mineral is stored primarily in the liver of kidneys. Manganese is used in the body through coenzymatic actions. The coenzymatic actions it assists in are urea formation, protein metabolism (amino acid interconversion), carbohydrate metabolism (activated glycolytic pathway and glucose oxidation), and fat metabolism (activated fat-clearing factors). Excesses of manganese have been observed following inhalation of the substance by industrial workers. These workers demonstrated symptoms of neuromuscular disorder similar to Parkinson's disease (Williams, 1979; Nutrition & the M.D., 1980).

Findings. Nine women took manganese preparations. Two women had doses over those recommended by USRDAs, and two women had one repeat in other nutrient supplements they were taking.

Copper

Copper shares characteristics and functions with iron. Metabolism of this mineral is similar to iron. Copper binds with albumin and the copper binding protein ceruloplasmin. It is absorbed in the small intestine (process not fully known). Copper is stored in

muscle tissue, in bones, and is present in liver, heart, kidneys, and the central nervous system. It is excreted in the feces, urine, sweat, and during menses. Copper functions in the respiratory cytochromic oxidation processes for tissue cells and in other oxidative enzymatic processes for amino acids. Copper functions erythropoietically with erythrocytin and separately from iron in the red blood cells and is essential for hemoglobin formation. This mineral assists in the absorption of iron by the gastrointestinal tract and in its transportation from tissues into plasma. Copper is also involved in bone formation, brain tissue formation, and myelin maintenance in the nervous system (Williams, 1979).

Some deficiencies of copper noted are from urinary losses as in nephrosis, inherited defect in copper metabolism (Menkes disease) exhibiting severe mental retardation and crimped "kinky" hair; and "untreated malnourished infants, premature infants and totally parenterally nourished infants and adults" (Trace Minerals in Human Health and Disease, 1976), adults with sickle cell anemia, and intestinal by-pass patients, high levels of calcium, high protein and high fever produces interference with its absorption in the small intestine (Nutrition & the M.D., Aug., 1980; Alfin-Slater et al., 1980). Smith and Mason (1980) report that excesses of copper are found in Wilson's disease, in 20 percent of 240 out-patient schizophrenic patients, in women taking oral contraceptive agents, and

in persons with arthritic disease.

Findings. Seven women were taking preparations with copper. One person's dosage exceeded the recommended levels.

Iodine

Iodine is a trace mineral associated with the thyroid gland in its function in the CNS and in plasma transport. It assists in the normal metabolic rate maintenance of all cells. It does this by its participation in the formation of thyroxine. Iodine in the form of iodides binds with protein and is transported by the blood to the thyroid gland. One third of the iodine ingested is selectively absorbed, and the rest is excreted in the urine. Iodine and thyroxine are released into the blood stream and used to bind with a plasma protein and are then carried to body cells as necessary. After a cellular oxidation process iodine is separated from the thyroid hormone by the liver and is excreted in bile.

Decrease of iodine produces a condition called endemic colloid goiter. It is due to the overstimulation of the thyroid gland cells by TSH (Thyroid Stimulated Hormone). Deficiency of iodine in salivary secretions contributes to dental cavities. Use of iodized salt is normally sufficient for areas that lack iodine in the soil.

Findings. Eight persons took preparations with iodine included in them. One dosage exceeded requirements for adults needs by the

USRDAs.

Selenium

Selenium is an element that contains a compound (factor 3) which is effective in protecting the liver against fatty acid infiltration and necrosis. It does this independently of vitamin E. Animal studies have found selenium is involved as a cofactor for enzyme systems in cell oxidation processes of polyunsaturated fatty acids (Williams, 1969; Nutrition & the M.D., February, 1980). Meats and sea foods are the best sources of selenium in the diet; but grain and grain products, eggs, dairy products, garlic, mushrooms, and asparagus are also sources of the mineral. There is no known evidence of selenium deficiency in this country, and supplementation is not recommended as excessive intake of the mineral can be lethal. Selenium was listed as a potent toxin (Underwood, 1975; Nutrition & the M.D., February, 1980).

Findings. Selenium was found to be used separately or together with vitamin E preparations by six of the women. There were no dosages over the USRDAs and no repeats in any other preparation taken.

Zinc

Zinc is involved through enzyme action in the kidney, pancreas, liver, eye, endocrine glands (in the epithelial cells), prostate secretions, and spermatozoa. Zinc is a carbon dioxide transporter by

way of the enzyme actions of carbonic anhydrase present in the red blood cells. Zinc assists in combining carbon dioxide with water in red blood cells. Through this enzymatic action, zinc allows the rapid release of carbon dioxide from pulmonary capillary blood and releases it into the alveoli. This mineral is also essential for interventions between pyruvic and lactic acids. It is a component of some peptidases and is involved in protein digestive processes of the gastro-intestinal tract. Kelsey and associates (1979) report that zinc's action can be blocked by high levels of calcium, high protein diets, diets high in vegetable and fruit fiber (Nutrition & the M.D., Aug., 1980; Nursing 80, 1979).

Findings. Twelve women took products containing zinc, and two were above recommended dosages. Three participants had repeats of the element in preparations they took. Two of these three participants also had a repeat of the mineral in one other preparation they were taking.

Herbs Used for Preventive and/or Therapeutic Health

Herbs are being relied upon by many people of the United States as remedies against aches and ills (Aikman, 1977). The belief that some foods have healing qualities while others are to be avoided in certain circumstances has been prevalent for people all over the

world. Medicinal plants used in self-medication as herbal remedies are not without some real dangers. The adherence to the old adage, "if a small dose works, a bigger dose works better," and not knowing exactly what one is using and what the results will be can lead to careless dosing and dangerous complications and conditions (Youngken, 1977).

The findings about what herbs rural family members use for health purposes follows. Herbs that were used by four or more of the participants are outlined and presented to provide information about some of the medicinal herbal substances that were used.

Rural Family Member Use of Herbs

The use of herbs for preventive and/or therapeutic purposes was a health care practice of seventeen subjects of this study. Three women stated that they used herbs for cooking only. Fifteen women stated they used herbs daily, and the main purpose was to prevent illnesses. The largest use of herbs was in the form of herb teas. Herb teas were stated to be used because of their "natural" medicinal aspects and because they were reported to be less harmful to the body's functions than other beverages such as coffee or tea. Coffee use was reported to cause participants problems with nerves (feeling shaky and overstimulated). One person also stated she started using herbal teas in place of coffee as a preventive deterrent to breast cancer. She

had read information that linked coffee to the incidence of breast cancer (she did not remember the source).

More women in the families used herb teas than other family members, but six women stated their husbands were cutting down on coffee use and were drinking some herb teas. It was reported two husbands drank only herb teas in place of coffee.

The reasons given for herb teas being used with meals and for between meal breaks were that herb teas are more natural, more beneficial to health because of the nutrient contents, and for the taste. The participants knew that the herb teas could produce medicinal effects, and some were used occasionally or daily for these purposes as well as for dietary purposes. The herbs listed for medicinal use were used as diuretics, demulcents, general relaxants, general tonics, anti-inflammatory agents, for nerves, to prevent gallstones, for arthritis, and for indigestion.

One-hundred-six different herbs were listed and used in single or multi-herb preparations. The highest number of herbs used by one participant was 36 and lowest number was one. One participant listed at least 16 different health reasons why she or her family used herbs. A woman who had used 29 different herbs listed eleven health conditions or purposes for their use. Most of the health conditions are listed in a later section of this chapter.

Eleven participants obtained herb supplies from one or more

health food stores in Great Falls, Montana. Four women stated they grew their own herbs for cooking and medicinal use. Shaklee and Pro-Vita herb products were used by four participants. Most users of Shaklee and Pro-Vita products were dealers for the products, which they said allowed them reduced rates on the products. Other sources for obtaining herbs were through a naturopathic physician or through chain or local grocery stores (teas).

The estimations for how long the subjects had used herbs for health ranged from four using herbs for less than one year to five who stated they had used herbs medicinally for many years. Eight of the women had used herbs for two to four years.

The estimated cost per year for herbs was not fully determinable. This was due to the variable amounts used, the variable frequencies for using herbs, and because some of the women grew some or all of their herbs. For those products that were available for inspection by the researcher, and excluding the use of commercial herbal teas (Lipton, Celestial, Begelow), the estimated monthly cost for medicinal herbs ranged from \$1.20 to \$32.70. The majority of the participants stated they had no idea what amount they spent for herbs monthly or annually. Persons of the lower incomes were found to spend the most for herbs. Persons over the age of fifty years used herbs the most.

The following herbs were used by four or more of the confirmed herb users of the study. The herbs are listed in alphabetical order.

General information about the herb, its preparation, classification, use, side effects, and/or precautions will be given. Information about the herbs was taken primarily from a variety of authors (Harriman, 1978; Hutchens, 1969; Hagener, 1977; McGrath, 1979; Murr, no date stated; Rose, 1980; Rau, 1980; Schauenberg and Paris, 1977; Jarvis, 1980, 1981; Seigel, 1976; Graedon, 1980; Tyler, 1982).

Alfalfa

Alfalfa, Lucerne (*Medicago sativa* L.) is a fodder crop plant found in global distribution. Its use has become more prevalent since the 1940s but the North American Indian culture recognized and used its properties earlier and called it Buffalo Herb and "Father of all Foods" (Hutchens, 1973). Alfalfa is a perennial plant, of which there are numerous varieties. It contains numerous vitamins such as A, D, E, and K. It contains the mineral salts of calcium, potassium, iron, and phosphorus.

Preparation. The seeds, sprouts, and leaves supply the ingredients that are used in salads, soups, cooked like spinach or used in teas, taken in capsule form or used in ointments.

Classification and Use. Alfalfa listed as a vitamin-mineral and protein source. Teas of alfalfa are used as diuretics for the kidneys, as a laxative, and as a general tonic. Alfalfa leaves, as a source of vitamins and minerals are reported to be anti-inflammatory

agent that promotes healing and prevents scaling of the skin. It is also listed as an anti-anemic and anti-hemorrhagic agent due to its enzymatic action in the digestive and circulatory system. There is lack of scientific or clinical evidence that alfalfa tablets are useful in human medicine (Tyler, 1982).

Side Effects. In combination with other herbs or drugs it has a potentiating effect such as increasing the effects of narcotics and alcohol. Warfarin is found in alfalfa and sweet clover plants. Although this plant is listed as an anti-hemorrhagic agent due to its content of warfarin, its use for persons on crystalline sodium warfarin or other anti-coagulant drugs is contraindicated (Medical World News, Dec., 1973). Alfalfa saporins are hemolytic and may interfere with the utilization of vitamin E (Leung, 1980).

Findings. Eleven women were taking alfalfa tablets or alfalfa tea preparations. The participants stated they took the alfalfa substances for a general tonic effect, for laxative effects, or for arthritis symptoms. They all stated that they believed that the substances had helped them feel better.

Aloe

Aloe (A. vera from Barbados, Curacao; A. perryi from Socotra or Zanzibar; and A. ferox from the African Cape) is a fleshy spined leaved juice producing plant. It contains the active constituents

aloin and aloe-emodine. It has been used medicinally since ancient times especially in the areas it is mainly grown.

Preparation. The juice from its leaves is expressed and evaporated for commercial use. It is used in a liquid, pill or powder state. It is also used as a household plant and leaves are used for minor burns or injuries.

Classification and Use. All forms of aloe are cathartic acting on the large intestine. It is reported to act as a stimulant to the uterus and vagina and promotes menstruation (emmenagogue). Powdered aloes are reported to be used in capsule form to eliminate pin worms. The fresh juice has been used as an emollient for the skin and mucous membranes to sooth minor burns, sunburns and insect bites. Aloes are being used in cosmetics for its stated healing properties. Some research articles have not found aloes to be as effective in burn treatment as previously stated (Jarvis, 1981). The fresh juice is reported to be effective as stated for skin healing, but stabilization of the plants properties has not proven to be successful (Tyler, 1982).

Side Effects. Without combination with other carminative substances aloe is irritating to the mucous membranes of the intestine and is contraindicated in inflammed conditions of the bowel and hemorrhoids. It is contraindicated in pregnancy due to its stimulant effect on the uterus. It will also act as a laxative to infants of

nursing mothers.

Findings. Four informants stated they had aloe plants in their homes to use for minor burns and injuries. Three informants reported that they or their family members were pleased with the effect of the plant substance for burns. Aloe was in some of the multi-herb laxative preparations that the participants used.

Camomile

Camomile (*Matricaria chamomilla* L., wild chamomile; *Anthemis nobilis* L., Camomille romaine, vraie, petite Fr.; Roman Chamomile) are from a variety of plants that grow in sandy and dry grassland areas or in cultivated fields, gardens, or embankments of Europe. The medicinal actions of the plants are similar. The plants yield a blue-colored volatile oil which when mixed with other active ingredients have an anti-inflammatory property (Tyler, 1982). The plants contain flavors (apigenin, luteolin, patuletin, and quercetin) which are active antispasmodics, and constituents which contribute to musclop-tropic spasmolytic activity, and to antibacterial and antifungae properties (Tyler, 1982).

Preparations. The various types of camomile plants are used as infusions, teas, oils, emollients, decoctions, compressed, enemas, or douches.

Classification and Uses. These plants are used as antispasmodics, carminatives, stomachics, for the digestive system;

antispasmodics for relief of migraine headaches, neuralgias, and nervous disorders; anti-inflammatory to treat ulcers, wounds, conjunctivitis, scalp disorders; and to decrease swelling and pains in the joints. The medicinal uses are reported to be subtle although maybe cumulative with extended use (Tyler, 1982).

Side Effects. Tea made from flower heads of these plants can cause dermatitis and anaphylaxis especially in persons hypersensitive to Compositae family member plants such as asters, ragweed, and chrysanthemums (Jarvis, 1980).

Findings. Camomile was used primarily in teas for its taste, and for its relaxant qualities. It was one of the most commonly used herb teas.

Cayenne

Cayenne (*Capsicum annum* L., Spanish Pepper, Paprika, Red Pepper, Chillie, *Capsicum*) is a plant whose fruits are used for its vegetable and condiment properties. It flourishes in tropical and temperate lands.

Preparation. The dried and pulverized mature fruits are sold as paprika and cayenne pepper (red pepper). These fruits are a source of the vitamins C, A, and B₁ and also contain calcium, phosphorus, and iron. It is used internally in infusions, as syrup, or as oil mixed with sugar. It is used externally as a plaster, in gargles, in a

vapor bath to inhale for congestion.

Classification and Uses. As a medicine it is said to be useful as a stimulant to the appetite as it activates gastric secretion and is used as a weak antiseptic. It produces a sense of warmth in the stomach and in the whole body due to its stimulation to the circulatory system. It is used for inflammation, sprains, bruises, rheumatism, and neuralgias when added to linament or plasters.

Side Effects. Small concentrated quantities can irritate the skin and mucosa producing burning, blisters, and dermatitis. In excess internally it causes gastroenteritis, and some kidney irritation has resulted from over use of this spice-herb (Schauenberg and Paris, 1977).

Findings. Persons of the study used this plant for sinusitis, gastro-intestinal and circulatory reasons.

Catnip

Catnip (*Nepeta cataria* L., Wild Catmint) is a common garden plant with mint-like aroma and taste. Cats like to eat it and to roll in it, and from this characteristic it received its name.

Preparation. It is used in teas, infusion, and its leaves are smoked for a marijuana substitute.

Classification and Uses. Catnip is used as an antidiarrhetic, as an anti-inflammatory for chronic bronchitis and for colic in infants,

as a sedative effect for fevers and headaches, and for restful sleep.

Side Effects. Mild hallucinations have been noted from smoking catnip leaves and from strong tea infusions. Other symptoms it produces are bizzarre speech and behavior and euphoria (Seigel, 1976). Catnip has been promoted as a psychedelic drug when smoked but this was from an erroneous article in the Journal of the American Medical Association (1969) which confused the plant's picture with a marijuana plant (Tyler, 1982).

Findings. Catnip was used in tea preparations. The herb was used for its mint flavor, and for its relaxant qualities. Several of the participants stated they grew catnip in their gardens and used it fresh or in its dried form. No one mentioned smoking this or any other herb preparation.

Comfrey

Comfrey (*Symphytum officinalis* L.) is a native plant of Europe, but it is now naturalized in the United States. It grows in damp grasslands.

Preparations. The root and leaves are used in teas, infusions, fomentations, decoctions, poultices, and douche.

Classification and Uses. Comfrey is a multi-use plant. The roots and foliage of this contains allantoin (a nitrogenous crystal substance) and an alkaloid (symphyto-cynoglossine), traces of

consolidine, choline, tannin, sugar, and starch. The plant is used for its scar and bone healing qualities, emollient, and sedative effects. It is also reported to be a source of vitamin B₁₂. It is also used as a demulcent and/or tonic to mucous membrane of respiratory and gastro-intestinal tract. The fresh plants' roots/leaves (crushed or bruised) are used in fomentations or poultices for its anti-inflammatory effects for bruises, sprains, ulcers, boils, and swelling of fractures. Douches made of the plant parts are used for cleansing the vagina and to treat leukorrhea.

Side Effects. No known side effects were listed in most herbal sources. There is reason to believe that taken internally comfrey is hazardous to the health due to its properties of four pyrrolizidine alkaloids. Two of these alkaloids (schimidine and symphytine) have been identified and are carcinogenic in rats when fed in concentrations as little as eight percent of their diet. Both the root and leaves of the plant have produced carcinogenic results in rats (Hill, 1976; Tyler, 1982).

Findings. Comfrey was another commonly used tea to replace coffee. It was also stated to be used as a general tonic for health maintenance.

Garlic

Garlic (*Allium sativum* L., the "Super Bulb") has been used

globally for centuries for many illnesses. It is a bulbous perennial plant. It contains an essential oil that is an antibiotic, allicine, diallyl sulphide; enzymes; and vitamins A, B₁, and B₂.

Preparations. The garlic bulb is used as a food, an oil, extract, tea, an inhalent, tincture, and ointment.

Classification and Uses. This multi-use plant is used as a stomachic, antispasmodic, diuretic, carminative, intestinal antiseptic, expectorant for bronchitis, diaphoretic, and anti-inflammatory. It is also said to decrease blood pressure.

Side Effects. The heavy odor of garlic, through the skin and on the breath is the major side effect of the plant.

Findings. Garlic was taken in tablet form and used in cooking for general health purposes. The participants mentioned its blood pressure reducing qualities and its carminative effects for bowel regulation, but no one stated it was being used specifically to decrease blood pressure.

Golden Seal

Golden seal (*Hydrastis canadensis* L., Yellow puccoon or Yellow Root) is a perennial herb native to eastern North America. It is a plant that was used by the American Indian for the yellow dye of its root, as an anti-inflammatory agent for the mucous membrane of the mouth, nose and sinuses, for skin disorders such as acne and eczema,

as a tonic for the gastro-intestinal system (stomach and liver), as a laxative, and as a douche. It is now also used as a tonic and is now being cultivated.

Preparations. Golden seal is used alone and in combination to produce the tonic or anti-inflammatory results desired. It is used in infusions, solvents, washes, with oils, decoctions, and lotions; or is powdered and taken in capsule form.

Classification and Uses. The tonic, alterative, laxative, and anti-inflammatory actions of golden seal have been used for conditions such as disorders of the digestive system (constipation, dyspepsia, asthma) and mucous membranes (catarrh); to heal ulcers and wounds; to increase venous tone; as a decoction in combination with myrrh gum to treat gonorrhoea, cancrs, and lip ulcers of syphilis; to treat ringworms; and in combination with other herbs to treat many other varied disease conditions (Hutchins, 1973; Rose, 1980).

Side Effects. The alkaloids, hydrastine and berberine, produce mild circulatory, uterine tone and contractibility on the central nervous system but unless toxic doses are given the effects are too uncertain to be therapeutically certain (Tyler, 1982). No other side effects were noted in the review of literature.

Findings. Golden seal was found in laxative or tonic multi-herbal preparations that the participants were taking. It was used or taken in capsule form.

Ginseng

Ginseng (*Panax ginseng*; *Panax quinquefolium* L.); *Panax ginseng*, also known as *Panax pseudo-ginseng* and *Panax schinseng*, is native to China, Korea, and Siberia, and its terms mean "all healing" and man root" (root looks like human body). *Panax quinquefolium*, "five fingered root," is used by North American Indians for medicine. This plant is said to be extensively sought in the United States and has been declared an endangered species (Tyler, 1982). Both varieties of ginseng are of the Araliacea botanical family. Two other plants of the Araliacea botanical family (tienchi-ginseng of China and eleuthero of Siberia, Korea, and China) are related to ginseng and claim similar actions (Tyler, 1982). The Chinese, according to Hume (1940) claim ginseng is ". . . a tonic to the five viscera - quieting animal spirits, establishing the soul, allaying fear, expelling evil effluvia (dissagreeable odors), brightening the eye, opening up the heart, benefiting the understanding, and if taken for some time will invigorate the body and prolong life" (Harriman, 1978, p. 20). There is no scientific evidence to support or demonstrate an understanding of how the drug works or does not work (Tyler, 1982). Triterpenoid saponins are in the ginseng roots and are believed to be the active components of the drug. The composition and number of these triterpenoid saponins vary in the different plants (Tyler, 1982).

Preparations. The root is chewed; extracts of the plant are

sipped as wine; or it is taken in powdered form (capsules, tablets).

Classification and Uses. Ginseng is used alone as an alterative, tonic, stimulant, carminative, demulcent, and aphrodesiac. It is also used as an adaptogen (increase body's resistance to stress) and to prolong life, to strengthen the central nervous system, to regulate the blood pressure, to decrease senility, to rebuild tissue, to give tone, to increase energy, to ease gripping pain, to decrease flatulence, and to soothe and protect the alimentary canal. Oriental cultures and parts of the Soviet Union use ginseng as a panacea (cure-all) drug (Tyler, 1982). The uses have been documented through its effects on such conditions as anemia, atherosclerosis, depression, diabetes, edema, hypertension, and ulcers (Farnsworth, 1973). There is no evidence of enhanced sexual experience or potency (Tyler et al., 1981).

Side Effects. Most lay references state there are no known side effects of ginseng. Some of the following sources demonstrate some potential side effects. The term ginseng can refer to any of 22 different plants, some are ginseng (or have properties of ginseng) and some are not (Seigel, 1980). Ginseng contains small amounts of estrogens and has been reported to cause swollen and painful breasts (Dukes, 1978; Palmer et al., 1978). Other drugs with similar actions have been known to be packaged and sold as ginseng. Tyler, 1982) reported two studies (Ziegler, 1979; Liberty and Der Merderosian,

1978) which confirmed the above problem with packaging and reported that one study showed up to 60 percent of 54 ginseng products investigated were without ginseng properties and 25 percent contained no ginseng at all (1982). Other drugs similar to ginseng are mandrake root, a plant that contains the amnesic and hallucinogenic drug, scopolamine; and snake root, a plant that contains reserpine which has anti-hypertensive, sedative, and tranquilizer actions depending on dosages used. Reserpine has side effects and cumulative actions of the Rauwolfia alkaloids, and the effects can last several days to two weeks. Large doses have been known to cause Parkinsonian rigidity during use, but dissipate when the drug was discontinued (Seigel, 1976, 1980). Other side effects from long term use of ginseng are reported (a study of 133 users by Seigel, 1979) which include high blood pressure, diarrhea, nervousness, and insomnia or opposite effects of low blood pressure and tranquilizing effects (Graedon, 1980; Tyler, 1982).

Findings. Ginseng was taken in capsule or tea form by seven participants. The reason given for its use was its general tonic effect, for its reported invigorating and life prolonging qualities.

Lobelia

Lobelia (*Lobelia inflata*, L., N.O.: *Lobeliaceae*) is commonly known as Indian tobacco, gagroot, and asthma weed. The American

Indian used this plant to treat syphilis, and as a diaphoretic, as an emetic, as a physic, as a relaxant (large doses) or stimulant (small doses). The drug's effectiveness in tuberculosis and nervous disorders are reported to be more imaginary than real (Tyler, 1982).

Preparations. Lobelia is used with other herbs to keep its stimulant, relaxant, or soothing effects. It difuses easily alone. The leaves, seeds, and stems of the plant are medicinal. They contain pyridine-derived alkaloids (lobeline, lobelaine, and lobelandine) which account afor the drug's effects (Leung, 1980). Its solvents are water and alcohol. It is used as tea, infusion, salve, or is smoked.

Classification and Uses. Depending on the part of the plant used, in combination with other herbs, and in large or small doses, it is reported that this plant works as an emetic; as a stimulant to multiple body systems; as an antispasmodic (convulsions, spasms, tetanus); as an expectorant or decongestant (asthma, croups, and whooping); as a diaphoretic; as a relaxant or sedative. In addition it is reported to have cathartic and astringent effects. Renewed popularity of the herb is said to stem from its reported euphoriant actions when smoked, used in tea, or taken in capsules. The actions are said to be similar to marijuana (Young et al., 1977).

Side Effects. There is discrepancy whether this herb is poisonous or is an antidote for poison. The drug is said to excite the central nervous system and then depresses it. It is said to

dilate bronchioles, increase respiration, produce increased heart rate, sweating, and low blood pressure (Wade, 1977). A current source states it contains lobeline, a central nervous system stimulant alkaloid, similar to nicotine, and that in large doses it can cause sweating, vomiting, paralysis, depressed temperature, coma, and death (The Medical Letter on Drugs and Therapeutics, April 6, 1979).

Used alone lobelia has little curative ability. It has variable actions on individuals, being noxious to some and soothing to others. Its effects are temporary when used internally and needs skill and caution in its use and dosages. "Self-administration of lobelia in any form (smoking, drinking, eating) of inexact amounts of any crude drug as potent as lobelia is sheer folly" (Tyler, 1982).

Findings. Lobelia was taken by participants in combination cathartic capsule preparations. No participant mentioned using the preparation alone or as a tea.

Mint

Mint (*Mentha peperita* L., peppermint; *Mentha spicat* L., brandy mint; *Mentha viridis* L., spearmint) are plants used for their scent, flavor and medicinal effects. The plants were documented in the writings of the scriptures (eaten with Paschal lamb), and the Romans used them as a scent for their arms. The medicinal parts of the plant are its leaves and stems.

Preparations. The solvent for mint is water (spearmint) and/or alcohol (peppermint). Mint is used in teas (warm, not boiled), applied locally (whole, crushed leaves, or as ointment, for a cooling and soothing effect. Infusions and its oils are used in flavoring and perfumes.

Classification and Uses. Spearmint has diuretic properties, and is used for kidney and bladder conditions that have symptoms of suppressed urine. Both spearmint and peppermint are used as antinausea, antispasmodic agents for the stomach and intestines. Mint is effective in relieving cold and fever symptoms, menstrual symptoms, and diarrhea. Fresh whole or crushed leaves applied to the head or body part are said to relieve headaches and other neuralgia symptoms. Peppermint oil is said to be useful in relieving the burning pain of shingles.

Side Effects. None were noted in the references used.

Findings. Mint was used by participants for flavor, for occasional gastritis symptoms, and in combination with other diuretic herb substances. Four informants grew mint for their cooking and tea flavoring.

Parsley

Parsley (*Aprium petroselenium*, garden parsley; *Petroselenium crispum*, *sativum*) has been used since antiquity. The leaves, roots,

and seeds are used medicinally, but the root and seeds are used the most for their pharmacological properties. It contains the vitamins A, B₁, B₂, and C and the minerals, iron, iodine, potassium, calcium, manganese, and copper.

Preparations. The oils of parsley seeds (*Ol. Petroselinii*) contain apiol and myristicin. These oils also contain quinia for fevers and ergot. Infusions are used internally or externally, as fomentations wrung out from the tea-infusion. Crushed-bruised leaves may be applied locally. It is also used in tincture and decoction form.

Classification and Uses. Parsley is used medicinally as a diuretic, a digestive aid, an anti-inflammatory (arthritis), as an emmenagogue (enhancer of menstruation), as an expectorant, and for its vitamin content.

Side Effects. This herb has been used as an abortive, the parsley volatile oil (apiol) should not be administered to a pregnant woman (Tyler, 1982).

Findings. Parsley was used for nutrient and digestive qualities, and as a general tonic preparation. It was also used as a mouth and breath freshener along with cloves. It was used in fresh, dried, capsule and tea preparations.

Raspberry

Raspberry (*Rubus strigosus*, *Rubus idarus* L.) is a perennial plant with a biennial growth pattern and belongs to the rose family. The leaves, berries and bark of the plants are used medicinally. The leaves contain quantities of vitamin C.

Preparations. The solvents for the raspberry plant parts are water and alcohol. The plant parts are prepared in teas, infusions, tinctures, decoctions, and syrups. It is used along or in combination with other herbs to produce its desired effects.

Classification and Uses. Medicinally raspberry plants are used as astringents, stimulants, tonics, anti-diarrhetics for infants and adults, anti-inflammatory agents for cankers of the mouth and for gargle for sore throats; as analgesic for labor; to prevent miscarriage; to increase maternal milk supply; as an astringent for external ulcers and wounds; as douche for leukorrhea; and as a diaphoretic and decongestant during colds and coughs.

Side Effects. None were noted in the references used. Adequate clinical studies have not been done on the drug's smooth muscle relaxant action on the uterus and intestines. No clinical evidence has identified pharmaceutical properties that would induce such action or to indicate that it is a therapeutically important drug unless no other drug were available for a mild astringent or anti-diarrhetic effect (Tyler, 1982).

Findings. Raspberry was used in general tonic preparations. It was found in multi-herbal capsule form daily or as needed.

Rhubarb Root

Rhubarb root (*Rheum Palmatum*, Official, *Rhaponticum*) for turkey rhubarb is the rhubarb plant used medicinally in the United States. Other variations of the rhubarb are used in England, East India, and China. The medicinal part of the plant is the root. (The garden rhubarb does not have medicinal properties (Tyler, 1982)).

Preparations. The medicinal root parts are solvent in water and alcohol. Boiling of the plant parts diminishes the purgative effect of the herb, but not the astringent effect. The size of the dose of rhubarb determines if it is a purgative (large dose) or a laxative (smaller dose). It is used as an infusion, syrup, powder, and tincture.

Classification and Uses. Its use and classification are mainly due to its combined effect as a cathartic and astringent. It is considered one of the safest cathartics and astringents of this type. It is a mild stimulator and tonic of the gastro-intestinal system. Its use is supportive rather than palliative. It is not recommended as a cathartic for constipation.

Side Effects. The red dye or coloring of the stalk and root can cause discoloration of the urine (red). If chewed it causes a yellow

tinge to the saliva. It is not recommended during inflammatory conditions of the gastro-intestinal system. It can produce gripping effects of the intestinal tract due to its acid content. The leaf of the rhubarb plant is poisonous and if ingested or inhaled (smoking the leaves) can cause hallucinations and death.

Findings. Rhubarb root was in two herbal combination laxative preparations taken by eight participants. The laxatives were taken in capsule form daily or as needed.

Herb and Health Food Costs to Rural Families

Seven of the eight informants who stated an annual income of \$20,000.00 or less, spent more money per month for herbs or health foods than other participants of the study. The range of money spent for vitamin-mineral supplementation ranged from \$4.50 to \$58.80/month. The average amount of money the informants spent on vitamin-mineral supplementation was \$17.00 per month. The 15 participants who used herbs spent from \$1.20 to \$32.70 per month for herbs. The average amount spent on herbs was \$7.50 per month. The informant who spent the most for total health food supplementation has one of the lower earned incomes.

Diagnosed Illnesses and Prescribed Drugs

Information was elicited about diagnosed illnesses of the informants, the family members still residing in the home, and the

prescribed drugs that the persons were taking. This was done to determine the general health status of the participants and their families and to determine if there were potentials for drug interactions for the known herb and/or health food users. It was found that Thyroid was a drug taken by six of the participants. One of these participants has taken the drug since having her thyroid gland removed three years ago due to cancer. The rest of the informants taking thyroid had taken the drug for several years. The reason most often given for beginning to use the drug was to relieve the symptoms of fatigue, depression, and general run down feeling. One participant did not think she had had her thyroid level checked for 20 years. Other participants thought or knew that they had had their thyroid level checked and stated they were continued on the medication due to the length of time they had already been on it and the body's adjustment to it.

Zyloprin was taken by one participant for a collagen disease. Motrin or Nalfon was taken by two participants for arthritis. Indocin was taken as necessary for a painful hip by one informant.

Hydropress, Essodrex, and Hydrochlorothiazine was taken by two participants for high blood pressure. One participant stated she checks her own blood pressure once a month and sees the doctor every two years. The other informant does not see the doctor regularly and does not have her blood pressure checked regularly.

Caffergot and chloropheniramine were taken as necessary for headaches by two informants. For one woman the headaches were seasonal (allergic). She stated these had decreased since starting to use more "natural foods" and honey.

Besides the disease conditions listed above, the women had the following diagnosed health problems: hiatal hernia; ruptured disc (this person was being treated by a chiropractor and had been for some time); gastro-intestinal ulcer; sinusitis; hypoglycemia; cataracts; and border line diabetes.

The husbands or family members of these informants also took drugs for health reasons. Of the medications reported taken by the family members, only one person did not know the purpose, effect to be expected, or side effects of the drug. This person was reported to have a heart condition and high blood pressure. The drug being taken was Inderal, an anti-arrhythmic, anti-hypertensive drug. Even though these informants stated that health care providers did not provide them with information about drugs they were taking, all but one of these persons knew what and why they were taking a particular drug at the time of the interview.

Informants' Sources for Drugs, Nutrients, and Herbs

Participants of the study stated that reading influenced some of their current practices and beliefs about drugs, nutrients, and herbs.

They cited at least 29 different books and a variety of 15 magazines or publications. Prevention Magazine, by Rodale Press, and Organic Gardening were magazines most frequently used for reference. Books on herbs, nutrition, and health by Rodale press were also frequently cited. Other popular books were those by Adele Davis on various health and/or family topics, Back to Eden, by J. Kloss (the book of choice on herbs), and books and articles about nutrition by Dr. R. Williams.

Persons reported to be the most informative on prescribed drugs were as follows: doctors (five participants); pharmacists (three participants); nurses (two participants); and chiropractors (one participant). Four participants stated they used reading as their means to gain information about drugs.

Information about health foods came from reading sources listed above, talking to personnel employed in health food stores, or reading hand out literature from the health food stores (ten participants).

Information on herbs was gained by the informants reading some of the same magazines and books listed above. Persons serving as sources of reference on herbs were as follows: physicians (three participants), naturopathic or homeopathic physicians (four participants), chiropractors (five participants), and health food store personnel (ten participants). Ten participants indicated they gained their information from health food store literature, while five

participants reported attending lectures.

The number of persons obtaining information from health food stores led the researcher to interview a health food store manager. The interview revealed that the personnel of the store are not specifically trained or educated to give information about nutrition, health foods, or health. Personnel are selected based on interest in the health/health food/nutrition areas and willingness to learn about the products and trends in the business. "All things in moderation" was the philosophy of the health food store manager. He reported that he encouraged his personnel to transmit the same philosophy to the persons seeking information in his store.

The manager further stated that in order to keep up in the health food business he had to keep abreast of the trends and information in the health/health food/nutrition areas. He utilized publications from the suppliers and salesmen. He did not wish to put out information or products that were faddish and expensive. He stated he used a dietician when he was seeking clarification on nutrition and some food-drug interaction information. The manager further stated that the public is confused and discouraged by some of the scientific data. He cited conflicting reports from the Federal Drug Administration, such as those about cancer causing agents, as specific examples of reasons why the public are seeking other health care methods and information sources. (Comments by some of the rural family

participants also confirmed this comment.)

Reasons for Herb and/or Health Food Use

When questioned why the rural participants used herbs and/or health foods for health purposes, all participants stated that it was for good health maintenance and to prevent health deterioration. Comments such as "healthier and tastes better," "if you eat right you feel better," and "can't improve on God's plan" were some reasons stated for natural food choices. Examples of why vitamin and/or mineral supplements were taken were described as "to be sure family has a balanced diet in these times of busy schedules at school and at home" or "I noticed my family had a year of broken bones and were generally not feeling well." Herbs were taken as a substitute for coffee or because of their nutritional or medicinal value.

A number of the informants reported health reasons that led to a change in behavior in nutrition, vitamin-mineral supplementation, or herb use. The following conditions and number of persons reporting the conditions were: a family member with increased irritability and periods of depression (two); arthritis (three); hypoglycemia (two); depression (three); to decrease symptoms of an inherited head and facial tic (one); a year of three or four broken bones within a family (one); hyperactive children in an immediate or extended family (three); hypertension (three); and sinusitis or allergy problems

(five).

A comment that each participant made was that the start of or continued use of vitamins, minerals, herbs, and/or an "improved" dietary plan had made them feel better physically and emotionally. For the majority this "feeling better" had persisted over a considerable period of time (six months to a year or more).

Fear of the use of pharmaceutical drugs and other chemical treatments pertaining to food was another reason expressed for continuing or starting to emphasize and use natural foods and herbs. Reports by the news media and reading references on the latest harmful side effects of previously medically acclaimed drugs or treatments also were stated to cause confusion, frustration, and mistrust of formal medical health care and/or scientific methods. Participants reported that some health care personnel who prescribed drugs did not explain what was to be expected from their use or what side effects to watch for. The continuous media reports that "almost everything you eat any more is supposed to be harmful to your health or causes cancer" were reasons they gave for their choices to use their own nutrition oriented preventive therapies.

Informants stated that they felt that their nutrition and health methods, namely, use of vitamins, minerals, or herbs, were received by health care providers with attitudes that seemed to demonstrate disregard, and lack of interest or knowledge. These perceptions by

the participants were said to leave them feeling frustrated and discouraged with the formal health care providers in relation to the nutritional area of health care.

A message that was repeated by each informant was that it was good to be able to explain and discuss nutritional and health care practices with a member of a health care profession.

Hutterite Herb and/or Health Food Use

A family from a Hutterite colony in Teton County was interviewed to get a sample of another type of agrarian family in the county who use herbs and/or health foods. Hutterite colonies are found in rural areas of several Montana counties. The Hutterite colony observed provided an agrarian communal life style for its members. Communal in this instance refers to persons or families living together who believe in the same religious and general philosophy of life. The Hutterite sample had similar farm-ranch behaviors and characteristics to the rest of the informant families observed. The members of the colony raise their own food products for the colony and to sell for economic support of the colony. The colony members produce garden products (a variety of vegetables), eggs, chickens for meat, geese for meat and feathers for pillows and bedding, cattle for dairy and beef products, and pigs. The colony members raise hay for cattle feed and also raise grain. Grain was observed in large piles on the ground

waiting for trucks to take it to storage areas to sell. The colony had modern equipment and facilities for their farm-ranch operations comparable to some seen on other informants' property.

One difference in lifestyle observed between the Hutterite informants and other informants was the communal living of the Hutterite colony members. The colony members live in apartment style residences rather than single family residences of the other participants. The apartments provided sleeping and living room facilities for the family members and an outside toilet facility for each apartment unit. The colony members all cook, eat and worship in communal kitchens, dining and church halls. A community bath house is used on a scheduled basis for men, women, and children.

The interview took place in an apartment that housed the family of the female informant selected for the interview. The contact for the interview was made through a registered nurse who was a friend of the Hutterite woman and her family. The interview was conducted in two sessions due to the confusing amount of information received from several members of the family. There was no known exchange of nutrition information between the Hutterite family and the other participant families.

For the comfort of the informant, her daughters, some of their children, and the resource person were present during the interview sessions. The information received was from the informant, the

resource person selected, and from the informant's four daughters. The five informants answered open-ended interview questions and took the researcher and resource person on a tour of the colony's community dining hall and kitchen, the bath house, the school/church house, the egg house, and the milking barn.

The eldest female family member was a mother, grandmother, and widow. The woman had two unmarried daughters and four married daughters who lived in the same colony. Two of the recently married daughters and two unmarried daughters lived in the same house with this woman. The daughters varied in ages from 19 to 36 years of age. Grandchildren observed were toddler to early school age (kindergarten). The children spoke only German and do not learn English until they enter the formal grade school of the colony at age six. This finding agrees with Hickey's study on Hutterite child-rearing practices (1981).

The colony women bake bread once a week using bulk purchased white flour, sugar, and salt. They make their own butter, use their own raw milk, use their own honey and eat diets that are reported to be high in fats and carbohydrates. An examination of a sample menu for a noon and evening meal confirmed the fact that the colony diet was high in fats and carbohydrates.

The women of the colony also help to tend the garden. They can and freeze all their own food products. After the colony gets its

supply for the winter and spring, they then sell food products to stores and persons in the area. Women also help with the chores in the egg house. In addition to the garden and house chores the women sew clothes for the colony. One of the informant's daughters also taught and tended the kindergarten aged children.

The informants stated that they and the colony members use multi-vitamin preparations at least occasionally (during winter and during cold or flu season) if not regularly. The colony buys supplements in bulk supply and uses a variety of brands according to the most economical price. The types observed were high potency vitamins, but were not of the high dosages that were used by the other informants of the study.

The colony informants stated that a good diet was the best way to stay healthy. They believed that they had a good diet at the colony. They explained that they used much fresh and mostly home produced products. The informants described themselves as healthy (able to work and few illnesses). They also advocated keeping busy and active as important to health.

Health personnel interviewed during a previous survey for graduate course requirements (1981), and the resource person stated the colony had health problems related to the gastro-intestinal system, the kidneys (infections), and the Hutterite women have problems with depression (no specific cause was indicated). It was

also stated that the colony members had problems with infections (viruses) which spread readily between colony members. One of the grandchildren had just returned from the hospital having recovered from an upper respiratory and gastro-intestinal upset. The child was observed playing with other small children during the visit. The child was also given a raw cucumber by an adult family member (not parent) to see if it would help quit the child when she became fussy.

The older and younger colony informants agreed that they no longer used herbal medicines to treat members of their colony, but believed that other colonies may still practice some of the "old ways." They said they preferred to go to a physician for health care and medicine if needed. They stated they grew some herbs for cooking such as dill for pickles.

One of the younger colony informants stated she read health articles when a friend would bring out magazines like Good Housekeeping. Otherwise there is little access to reading material on nutrition or health at the colony other than The Bible.

Chapter 5

SUMMARY AND CONCLUSIONS

Preventive or therapeutic health care through nutrition and supplemental use of health food and/or herbs was a self-confirmed practice of the participants of the study. For the majority of the rural family members the practice and use of herbs and/or health foods had been in existence for one year, or for many years.

The majority of confirmed herb and/or health food users from Teton County were middle class, had at least a high school education, were women between 27 and 87 years of age, and were active in some form of the farm-ranch industry. Other studies done on the use of health food found that confirmed health food users were either middle class, of a productive age (Rhee and Stubbs, 1976) or were of an older age group, and were from lower socio-economic groups (Jalso et al., 1965), or were young adults, were employed, and most of them had realistic ideas about nutrition and the nutrient value of food stuffs (Wolff, 1973). The majority of persons in the study who spent the most for herbs and/or health foods and who used the most herbs and/or health foods were semi-retired, and reported lower incomes.

The agrarian lifestyle of these participants facilitated their practice of growing their own gardens as well as the production of most of their own grain, meat, egg, and milk products. The foods most

frequently mentioned and used for natural value were honey, whole wheat flour products, beef raised without chemical intervention, and raw milk.

All of the agrarian participants preferred foods grown without pesticides or commercial chemical fertilizers, and purchased foods without preservatives, artificial coloring, or additives whenever possible. The informants all stated they encouraged balanced diets and/or "healthier" nutrition practices for themselves and their families. However, they also used the "insurance" approach to nutrition by using supplemental vitamins and minerals. Phrases such as "healthier for you," "if you eat well you feel better," "can't improve on God's plan," "less preservatives and pesticides," and "alleviate a specific illness or symptom" were examples of why this sample used herbs and/or health foods. Graedon (1980) and Williams (1978) also report and support the "nutritional insurance" trend.

Generation to generation passage of nutrition and health care practices, plus reading influenced the majority of participants' choices in nutrition, herb, and/or health food practices. Reading materials of the participants supported their beliefs that "natural is better," that chemical additives and treatment of food were hazardous to health, that herbs were a natural way to heal, and that health care personnel lack nutrition expertise. The Rhee and Stubbs study in Texas (1976) reported that reading material of health food users also

encouraged the belief that commercial pesticides affect the nutritional value of foods. Alfin-Slater, a professor of nutrition, states that the question of fertilizers is controversial, and that control of pests is an ongoing problem in the nutrition field (1978).

Even though the informants preferred food products without chemical treatment they live in a county where agrarian participants use potentially harmful commercial pesticides (a term inclusive of substances that control pests, insects, and fungi) to protect their crops and animals. For their own families the informants either raised food products which were primarily produced without commercial chemical supplies or purchased food supplies from neighbors who follow the same practice.

Findings revealed that all of the participants used some type of nutrient supplement. The findings coincide with Campbell's (1981) statement which cited Federal Drug Administration surveys of the 1970s that estimated 55 percent of the country's consumers take nutrient supplements. Other than the vitamins prescribed for two pregnant women, the majority of the multi-vitamin preparations, with or without minerals contained high potency (above USRDAs) dosages. Some of the high dosages of vitamins and minerals were in ranges of previously scientifically documented cases which had hazardous and/or lethal side effects (vitamin A, 50,000 IU), had known interactions with each other, or with other nutrients, or with drugs (the B vitamins), and

interfered with diagnostic tests (vitamin C).

Between 17 and 20 informants were taking the fat soluble vitamins A, D, and E, and at least half of the women used high potency dosages of the vitamins A and E. The toxicity of excessive amounts of vitamin A have long been known and are documented. Current studies are also finding side effects from high levels of vitamin E (Beisel, 1981).

The vitamins B and C were used by most informants in high potency preparations and eight to nine persons had repeated the nutrient in one or more additional nutrient preparation. The literature cited the B vitamins, niacin, folic acid, and cobalamin as being associated with problems of hypervitaminosis as well as drug interactions. Vitamin C is cited as the most controversial vitamin. Scientific and lay information is confusing about the use of vitamin C. Authors and sources disagree about its megadose actions and uses. There are known physiologically beneficial and/or toxic effects of the vitamin as there are with many of the vitamins consumed in high dosages. Also almost all of the vitamins interact and interfere with some medication.

There were no toxic effects indicated in the sample even though megadose levels of the nutrients had been taken over a period of time. The rural sample did not appear to consider the high potency vitamins and minerals they were taking as drugs. The informants also did not

acknowledge that the synthetic and natural nutrient supplemental substances break down into the same chemical composition with equal effects following the digestive process (Bergerson, 1976; Alfin-Slater, 1978).

Most of the vitamin and mineral preparations purchased by the informants were from "natural vitamin-mineral sources." The majority of supplements were purchased through wholesale companies such as Shaklee and Pro-Vita, health food catalogs, or from retail drug stores. Hutterite informants stated they purchased nutrients in bulk supplies.

Seventeen of the participants used herbs for preventive and/or therapeutic health care. There were 14 herbs that were used by four or more of the participants. At least four of these herb preparations (lobelia, ginseng, comfrey, parsley) have known toxic side effects when they are used for extended periods of time, are used in high dosages or used in combination with other drugs. The participants used a total of 106 different herbs either in single or combined preparations. Herbal teas were the most common preparations used, whether used simply as a nutritive beverage to replace coffee or to treat a specific condition. Diuretics, cathartic, aromatics, and sedatives were the most frequent classifications found among the herbs used. Catnip, lobelia, (which were used by the participants) and nutmeg are reported to produce side effects such as hallucinations.

In high dosages nutmeg and the lobeline in lobelia can cause liver damage, coma, convulsions and death (Wade, 1977; Jarvis, 1979). The review of literature revealed some misconceptions about the hallucinogenic potential of catnip (Tyler, 1982). The most controversial herb taken by some of the participants was ginseng. Ginseng is a term which can refer to any of 22 different plants (Seigel, 1980). These plants have variable quality, strengths, and actions (Tyler, 1982).

The most commonly prescribed drug being taken by the participants was Thyroid. With the exception of two persons, this drug was prescribed over five years ago for symptoms of fatigue, depression, and/or generally not feeling well. These are the same symptoms for which some persons are taking vitamin and mineral supplementation today (Sabry, 1977). Some of the informants stated they did not know whether their thyroid level had been checked for several years.

Drugs for high blood pressure were the next most common type of pharmaceutical drug taken by the participants and/or their husbands. Two persons on blood pressure medications were not monitoring their blood pressures regularly. It was noted that some of the herbs taken by the participants also were reported to have actions that affect (decrease) blood pressure although none were reported to be taken specifically for that reason.

Fear of drugs and chemicals and confusion over formal health care

methods that have not produced more optimum states of health were stated to be the reasons that herb and/or health food users practiced nutritional preventive and therapeutic health care. The rural family members were not adverse to seeking medical assistance for more apparent illnesses and symptoms, however, the majority felt they had not received encouragement or support for their nutrition-oriented preventive health care practices, and some were turning to chiropractors, homeopaths, and naturopaths for help with nutrition-oriented health care.

Reading materials about health through nutrition in both the scientific and lay literature is controversial and confusing. Participants complained of reading and hearing that "almost everything causes cancer anymore." An interview with a health food store manager revealed that he frequently heard this comment from health food consumers. (Ten of the participants used health food store personnel and/or literature as nutrition and health food resources.)

All of the participants stated that they "feel better" since participating in their herb and/or health food practices. The feeling has persisted for the majority of participants for a year or more. These findings are not disputed by previous scientific studies, but the physical and/or emotional cause for them is yet undiscovered. Various authors support the placebo concept which has been noted in various alternative health care practices (Cousins, 1978; Pelletier,

1980; Herbert, 1980; Graedon, 1980).

In summary, some sentiments commonly verbalized by the informants are as follows: being able to seek more optimum health through nutrition was important to them. The informants indicated a need for a health care person who would listen to them about their nutritional health care practices. They recognized their right to seek alternative methods of health care. They were reading from a variety of sources about nutrition and health care. They needed acknowledgement for their self-health care efforts. Finally, informants expressed appreciation and surprise that a health care person was interested in learning more about their nutrition-oriented health care practices.

Conclusions

The women in this sample, like other women in this society, are using nutrient supplementation to "insure" a more normal or optimum state of health (Campbell, 1981). The use of high potency nutrient supplements and herbs for preventive and/or therapeutic health care was not uncommon. Known toxic effects do occur from excesses of herbs and or health food supplements, but these informants did not indicate any symptoms other than they have felt better since using the various substances. The agrarian informants also indicated that they are willing to put forth great effort to provide balanced "healthy" diets

for themselves and their families. They are willing to read about health and nutrition concepts, and to discuss their health practices with health care providers if they will listen. They practiced their nutrition-oriented health care on recommendations of family members, friends, health food store personnel, chiropractors, naturopaths, and authors of various nutrition, herb, and health books and publications.

These data cannot be generalized to the general population of rural herb and/or health food users, but the study does provide insight into areas where more nursing research could be done. From the data, the following conclusions and recommendations were compiled.

1. As nutrient dosages are increased above an amount necessary for normal to optimal physiological function and health, the possibility of toxicity increases and safety margins for the individual are reduced. Elevated intakes of nutrients increase the probability of toxicity. Nurses need to consider that the results of long term use of nutrients is still in an experimental state in animals and man. There may be populations at risk such as the aged who have decreased metabolic function, who are on drugs, and who have intakes of diet supplements of questionable quantity and quality. The variables that can alter the individual's susceptibility to nutrient and/or herb excesses are numerous. Genetic background, age, dietary composition, and conditions of the body and environment can alter physiologic

function. The nurse's ability to recognize toxic signs, symptoms, and indicators may be a factor in preventing serious toxic conditions and/or complications. Being able to obtain and assess dose-response data from individuals and population sub-groups is difficult, but credible information requires supported epidemiological data. Documented cause-effect factors need to include the consistency, strength, relationships, and congruency of associated findings, and correlation with knowledge of physiological and biological mechanisms. Nurses then need to publish their findings in publications used by their peers and clients.

2. Nursing assessment tools need to include more specific questions about the use of vitamin-mineral supplementation and herb use. Information needed about these substances is the strength or potency, whether more than one preparation is being taken, how often it is taken, for how long, and the effects it has produced. It was found effective in the study to ask informants if the container could be examined so the label could be read as multi-vitamin preparations from the various suppliers varied considerably in contents and potency.
3. Herbs can produce drug effects, whether they are used as teas in place of coffee, are smoked, or are used as poultices. It is the use of large amounts of herbs or their use for extended periods of time that cause most problems. However, allergies and

interactions with various combinations and strengths of preparations can occur. Generally herbal use should be treated as drug use when assessing and counseling clients. However, there are specific variations in herb strength due to the nature of plant preparations.

4. There is reason for the confusion of health care providers and the public when it comes to references on nutritional health care. Conflicting information abounds in both scientific and lay references. Nurses need to be able to read, to listen, and to think critically about information presented, and need to teach their clients to do the same. Scientific and lay articles and authors need critical objective assessment when used as reference sources. The epidemiological approach to information sources is required. Substantially supported cause and effect data is needed to support practices or to try to change them.
5. When counseling persons regarding nutrient use, whether it is for special population groups, patients with malabsorption syndromes or other pathological conditions, it is well to remember that synthetic vitamins-minerals and natural vitamins and minerals used for vitamins-minerals are used equally when broken down into their specific chemical compounds during digestive processes. More is not necessarily better regarding vitamins or any other nutrient, herb, or drug. Excesses of most of the nutrients are

known to cause some interactions or harmful side effects. The USRDAs estimations of requirements for vitamins and minerals, are based on the upper limits of what scientific research has found necessary for average adult needs (adjusted for infants, children, and pregnancy). However, needs of individuals differ for multiple reasons so excesses and deficiencies are understood possibilities. Clients need to be taught the indicators of deficiencies or excesses depending on their needs.

6. The area of nutrition, health foods, and herbs, in relation to health care is a sensitive one and needs to be approached cautiously if nurses are to retain the trust and cooperation of the clients they serve. Meeting emotional needs is a high priority which requires skill and tact. The way individuals are perceived affects whether they will be listened to or not. Erroneous beliefs or practices can be challenged when a trusting relationship has been established. Listening for what a person believes and why, is necessary, for judgment of a specific practice from the standpoint of lack of knowledge on a subject is soon found out. The words "natural" and "health foods" are based on strong convictions related to "goodness" and "health," and are expressed as "good for you" and "healthier." Persons have the right to choose alternate methods of health care. Some of their nutritional health care ideas and practices have merit as well as

fallacy, and need to be acknowledge. Interceding into their practices should present them with a variety of health care choices that are potentially less harmful than their present practices. Change takes place slowly, especially if practices and beliefs are strongly based. Patience, adherence to "moderation in all things," and tolerance of beliefs which persist and which are mistrustful of conventional nutrition and health practices is necessary (Jarvis, 1980; Alfin-Slater, 1978; Herbert, 1980).

Implications and Limitations

Some of the informants of the study used nutrients and herbs in dosages which are considered to be toxic by nutrition and pharmacology sources, and some informants had also used some of the substances for periods of one year or for many years. As a result of those findings and the conclusions stated above, the following implications for nursing and questions for future study were derived.

More comprehensive nutrition, food supplementation, and herb use questions need to be added to health histories to elicit information about individuals' past and current nutrition oriented preventive and/or therapeutic health care practices. Nurses and health care personnel need to publish cause-effect articles on nutrients and herbs in publications that clients are using as reference sources. The

information needs to be presented in language which is common to the clients and needs to be presented in a non-judgmental way, using objective examples to support statements. Nurses and allied health care personnel need to assist each other by updating and correlating information about food supplementation and herb use, by collaborating on studies and articles, and by sharing new findings with each other during team efforts on their clients' behalf.

The study prompted the following questions for further research. What do nurses need to know about the long term effects of high potency nutrient intake? How can nurses better assess the nutrition, nutrient supplementation, and herb health care practices of their clients? What measures can nurses use to assist clients in preventing toxicity or the interaction effects of herbs, health foods, and nutrients used?

1. Convenience sample: The purpose of using convenience sampling such as "snowball sampling" (Polit and Hungler, 1979) is to select people who are knowledgeable about a particular problem. The method has limitations from the standpoint of application of statistics for generalization, and provides the possibility of biases which may be overlooked. Not enough was known about rural food supplementation and herb use to use a more powerful approach.

2. Sample size: A small sample was used to discover in depth patterns of nutrient and herb usage and the purposes for using herbs and/or food supplements. The Hutterite group was included for comparison, to discover if there were commonalities or differences between the Teton County farm-ranch informants and the Hutterite participants of one colony in the country. One Hutterite family was selected from that group because of the uniformity of the culture. Small sample size can provide misleading data since representativeness of a particular group is unknown.
3. Interviews: The number of interviews per informant and the length of time each interview lasted were limited due to distances to travel and due to the harvest season. Harvest season may have caused informants to feel rushed or to give limited responses because of pressures of work to be done. The amount of response to the requested data, and the voiced appreciation of the informants about having a health care person listen to them and learn from them did not indicate a major problem in this area. Being interviewed by a member of the formal health care system possibly biased answers of informants concerning health care and health conditions. Informants may have given answers perceived as expected rather than sharing real concerns or perceptions. In addition, being questioned by a

nurse led informants to ask health care questions not related to the study. Setting time limitations as interviews were scheduled and started, and answering health care questions at the end of the interview were measures used to eliminate biases of this type.

4. Questionnaire: Open-ended questions gave informants' responses in their own words, but was problematic in categorizing as well as time consuming. Inappropriate categorizing, misinterpretation of responses, and/or an inadequate classification system were also possible biases. This form of questioning also allowed for the analyzed data not to add up to 100 percent because answers such as "do not know" and "do not want to answer" arose.

Sensitivity of areas like economic status even though presented in ranges did not facilitate a 100 percent finding. The study was limited by the use of an untested health food, nutrient supplementation and herb use questionnaire. Due to the lack of availability of such a tool a questionnaire had to be developed from various nutrition and health survey tools. The use of a tested tool would strengthen the validity of the data collected and decrease the bias potential.

5. Hutterite information: Obtaining information from Hutterite informants required a less uniform presentation of questions due to many responses being given at once which limited the

usefulness of the information on a comparison basis. More time for inculturation into the colony would have helped. The use of resource persons as well as informant responses assisted in clarifying responses. Information from the interviews as well as from observations complimented findings of the Hickey study on Hutterite child rearing practices (1981). Language, the agrarian and commune lifestyle, and child rearing practices were examples of similarities observed.

APPENDICES

APPENDIX A

Rural Family Member Vitamin and Mineral Use

Table 1. Rural Family Member Vitamin Use.

Revised Recommended Daily Dietary Allowances (RDA)* VITAMINS	USRDA 1980*	Nutrients Taken by	Over USRDA	Dose Repeated
<u>Fat Soluable Vitamins</u> (Adult)				
Vitamin A (retinol)	5000 IU	17	11	4
Vitamin D (calciferol)	400 IU	18	4	3
Vitamin E (tocopherol)	8 mg/30 IU	20	9	7
Vitamin K (menadione)	140 mcg	0	0	0
<u>Water Soluable Vitamins</u>				
Vitamin C (ascorbic acid)	60 mg	19	18	4
Thiamine (B ₁)	1.4 mg	18	14	8
Riboflavin (B ₂)	1.6 mg	19	17	8
Niacin (nicotinic acid, B ₃)	18 mg	19	10	9
Pyridoxine (B ₆)	1.8 mg	20	14	9
Folacin (B ₉)	0.4 mg	15	3	1
Cobalamin (B ₁₂)	3-6 mcg	17	12	9
Pantothenic Acid	10 mg	15	11	7
Para-Aminobenzoic Acid (PABA)	20-30 mg**	10	9	0
Inositol	200 mg**	10	7	1
Choline	250 mg**	12	3	1
Biotin (Vitamin H)	0.3 mg	13	0	2
Rutin	200 mg**	3	1	0

IU = international units

mg = milligram

mcg = microgram

* Recommended Daily Allowance revised 1980.
(Home and Garden Bulletin Number 72, Revised 1981)

** Not a USRDA. Dosage is high range of dosages recommended by
Williams (1978).

Table 2. Rural Family Member Mineral Use.

Revised Recommended Daily Dietary Allowances (RDA)* MINERALS	USRDA 1980*	Nutrients Taken by	Over USRDA	Dose Repeated
Calcium	1200	19	5	10
Phosphorus	1200	13	3	5
Magnesium	350	16	1	3
Potassium	2-6	7	0	0
Manganese	5	9	2	2
Iron	10 m/18 fe	14	3	3
Copper	3	7	1	0
Zinc	15	12	2	3
Selenium	.20	6	0	0
Iodine	150	8	1	0

mg = milligram

g = gram

mcg = microgram

*Recommended Daily Allowance, revised 1980.

(Home and Garden Bulletin Number 72, Revised 1981).

APPENDIX B

Letter to Dr. Lynn Brady

Laura Lee Phillips
716 32nd Avenue N.E.
Great Falls, MT 59404
May 22, 1982

Dr. Lynn Brady
School of Pharmacy S.C. 68
University of Washington
Seattle, WA 98195

Dear Dr. Brady:

This letter is in response to our phone conversation on 5/21/82 concerning herbs and about my research study on rural family member use of herbs and/or health foods. As I stated before I have had difficulty finding studies or reliable information about the action, use, or side effects of herbal preparations.

To give you some background information about some of my data - I found 106 different herbs were used for medicinal purposes by seventeen of a (N=25) sample of farm-ranch women from a county in this state. Four or more of the women used the following herbs in single or combination preparations: alfalfa; aloe; comomile; cayenne; catnip; comfrey; golden seal; lobelia; ginseng; parsley; raspberry; and rhubarb root.

If you have any references with studies about the first nine herbs listed I would appreciate copies of them and I will gladly reimburse you for the copying and postage charges. I would also appreciate the name or names of books with the more reliable references on the medicinal action, use, and side effects of herbs.

Thank you for your previous comments on herb research. I will be looking forward to hearing from you soon.

Sincerely,

Mrs. Laura Lee Phillips, R.N.
Graduate Student
Montana State University

APPENDIX C

Letter from Dr. Lynn Brady

UNIVERSITY OF WASHINGTON
SEATTLE, WASHINGTON 98195

School of Pharmacy
Office of Academic and Student Programs

May 26, 1982

Mrs. Laura Lee Phillips
716 - 32nd Avenue NE
Great Falls, Montana 59404

Dear Mrs. Phillips:

I have reviewed the list of herbs in your recent letter, and I want to make the following comments:

1. Alfalfa There is no documented therapeutic benefit associated with this plant.
2. Aloe There are some valid uses for aloe, namely, its internal use as a cathartic and its topical use as a protective in burns and abrasions.
3. Chamomile This is a generic term. All of the chamomiles do have subtle "medicinal" uses, but they have no pronounced therapeutic effects.
4. Cayenne This is red pepper. It is a carminative and has weak antiseptic properties, but it is not recognized to have major therapeutic utility on oral ingestion. It is used topically as a rubefacient.
5. Catnip There is no documented therapeutic benefit associated with this plant.
6. Comfrey The potential toxicity of this plant is such that it should not be ingested.
7. Golden Seal There is no documented therapeutic benefit associated with this plant.
8. Lobelia This plant has some pharmacologic properties, but the risk-benefit ratio does not favor use of the crude plant material for therapeutic purposes.

Mrs. Laura Lee Phillips
 Page Two
 May 26, 1982

9. Ginseng This is the most controversial plant material on your list. The subtle pharmacologic actions which appear to be associated with this plant may not "program" with our western concept of medicine. For example, the adaptogenic category is not widely recognized in pharmacology.
10. Parsley In dealing with materials from parsley a person must distinguish between the crude plant material and the volatile oil. The plant material ingested in reasonable amounts has no dramatic pharmacologic properties, but the oil can be highly toxic.
11. Raspberry There are a few "medicinal minor properties associated with this plant, but they are of no recognized therapeutic significance.
12. Rhubarb Root The material has cathartic properties if the root is from medicinal rhubarb, but garden rhubarb lacks these properties.

As I indicated during our phone conversation, reliable studies on herbal medicines are scarce. Information has to be taken from various chemical and biological sources and then placed into the best possible perspective for any given situation which happens to be at hand. Thus, the situation is frequently more one of calculated judgement than of documented scientific fact.

I do want to mention four literature sources, one published within the past week, offering potentially good access to the literature. These are:

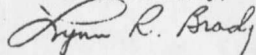
1. W.H. Lewis and M.P.F. Lewis, "Medical Botany" John Wiley & Sons, New York, 1977.
2. V.E. Tyley, L.R. Brady and J.E. Robbers, "Pharmacognosy", 8th ed., Lea & Febiger, Philadelphia, 1981.
3. A. Osol and G.E. Farrar, eds., "The Dispensatory of the United States of America", 25th ed., J.B. Lippincott, Philadelphia, 1955. (USD)
4. V.E. Tyler, "Honest Herbal", May 1982.

Mrs. Laura Lee Phillips
Page Three
May 26, 1982

We recognized the emerging interest in herbal remedies by devoting a chapter to this topic in the last revision of our pharmacognosy textbook. I personally use the 1955 USD for many purposes since it is one of the most comprehensive compilations available on the use of plant drugs, but it has to be evaluated critically and placed into perspective of current medical knowledge. The "Honest Herbal" by Tyler is an expansion of what we started with the chapter in our textbook. I learned by phone yesterday that the book was published last week. It is being published by a small publisher in Philadelphia and is being distributed nationally by Scribner. I have not received a copy yet, but I reviewed the book in draft form. I am enclosing photocopies of the manuscript pages dealing with alfalfa, aloe, chamomile, catnip, comfrey, golden seal, lobelia, ginseng, parsley, and raspberry.

I hope that these comments and the enclosed information are useful in your project.

Yours sincerely,



Lynn R. Brady, Ph.D.
Professor

LRB:mms

APPENDIX D

Human Needs Statement

MONTANA STATE UNIVERSITY SCHOOL OF NURSING
HUMAN NEEDS STATEMENT

Research Project: Rural family use of herbs/health foods as preventive and therapeutic care.

Dear Rural Family Member:

As a graduate student of Montana State University's School of Nursing, I am asking you to participate in a study on herbs/health foods. The purpose of this study is to determine what herbs/health foods rural family members are using as preventive or therapeutic health care measures.

For this project, health foods are defined as any dietary substances, natural or synthesized such as: vitamins, minerals, "natural foods" (without preservatives) used for health care; herbs are defined as plants or plant parts used for medicinal qualities; and rural denotes areas of fewer than 2,500 population or in open country.

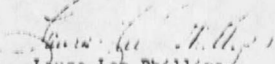
Health care providers are being urged to pursue and stress preventive health care measures conjunctively and cooperatively with health care consumers. By becoming more aware of the nutritional health care practices being used, nursing can more readily assist consumers when health needs and questions arise. The information from this study will, hopefully, assist nursing to understand some nutritional health care measures that are commonly employed by some rural family members.

If you choose to participate in this project, you will be asked to participate in a brief individual interview with this nurse-student. The interview will consist of completing a questionnaire on use of herbs/health foods for health care. The interview will be conducted on a date, time, and place mutually agreed upon by you and this nurse-student. Participation is voluntary. All answers will remain confidential and anonymous, and individuals will not be identified. Your answers will be analyzed and summarized together with the entire group of participants.

If you are willing to participate in this study, please sign this form and fill out the attached card. Leave the signed copy of this form and the completed card with the person who gave you this form. I will contact you reference setting a date for an initial interview by August 30, 1981.

Thank you for your time and consideration of this study.

Sincerely,


Laura Lee Phillips
M.S.U. Graduate Student
716 32 Avenue Northeast
Great Falls, Montana 59404

Approval Signature

Date

APPENDIX E

Letter from Dr. David K. Shefrin

DAVID KERN SHEFRIN, N.D.
Naturopathic Physician
11—SIXTH STREET NORTH
GREAT FALLS, MONTANA 59401
TELEPHONE 408-727-6680

August 6, 1931

This letter is to introduce Laura Phillips. She is a graduate nurse working on her Masters Degree at M. S. U. in Dozeman. She has requested my cooperation in doing case history studies on; why people in rural areas use vitamins and herbs, which vitamins and herbs they use and the results of vitamin/herbal therapy.

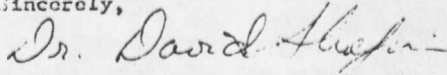
I cannot divulge any information from our confidential patient files so we are requesting that you answer her questionnaire and return it to her as soon as possible.

Your replies will be kept confidential and they will be greatly appreciated. Only the statistics will be printed.

I myself am very interested in her results.

Thank you for your cooperation.

Sincerely,



Dr. David K. Shefrin

DKS/gb

APPENDIX F

Interview-Questionnaire: Herbs/Health Food Use for Health Care

INTERVIEW-QUESTIONNAIRE: HERBS/HEALTH FOOD USE FOR HEALTH CARE

NAME: _____ SEX: _____ DATE OF BIRTH: _____
 ADDRESS: _____ MARITAL STATUS: _____ INTERVIEW DATE: _____

1. Education level completed: _____
2. Presently in school? _____ 3. If so, where? _____
4. Occupation: _____
5. Income level: _____ \$5-9,000 _____ \$10-14,000 _____ \$15-20,000 _____ Above \$20,000.
6. What family members are presently residing in your home? _____

7. What are the ages of these family members? _____
8. Are you pregnant? _____ Stage: _____ Lactating _____
9. If pregnant, have you changed the way you use herbs/health foods? _____
 a) How? _____
 b) On whose advice? _____
10. Do you use herbs for health purposes? _____ yes _____ no
 If you answered yes to the above question, list the name, reason and frequency of use.
 Example: Sage tea gargle for a cold 1-2 x/year
 Camomile tea for sleep or stress 1x/eve. or as necessary

11. Where do you usually get your supplies of herbs? _____
 If home produced, what? _____
 Do you home preserve herbs? _____
 What? _____ How much? _____

 If purchased, kind of store:
 (Health food) What? _____ Why? _____
 (Large chain) What? _____ Why? _____
 What? _____ Why? _____
 Estimated cost of herbs for care purposes? _____ /mo _____ /yr
 How long have you been using the herbs listed above? _____
12. Do you use natural foods (without preservatives) for health purposes? _____ yes _____ no
 If so, list reason for using _____

13. Who recommended or prescribed use of the above herbs or natural foods?

APPENDIX G

Definitions and Terms Useful in Herbal UseClassification of Herbs

Alterative:	Produces a favorable change to normal body function without perception.
Anodyne and Analgesic:	Relieve pain without the loss of consciousness.
Aromatic:	Produces warm pungent taste or smell.
Astringent:	Causes contraction of tissues and decreases size of vessels.
Carminative:	Expells gas from stomach, intestines, or bowels.
Cathartic:	Evacuates the bowels by stimulation and by irritation.
Demulcent:	Soothes, relieves inflammation of mucous membranes.
Diaphoretic:	Induces perspiration.
Diuretic:	Increases quantity and flow of urine.
Emmenagogue:	Stimulates menstrual flow.
Emollient:	Soothes, softens, and protects tissues.
Expectorant:	Facilitates and induces expulsion of mucous from respiratory tract.
Febrifuges:	Reduce fever.
Laxatives:	Promotes bowel action.
Mucilaginous:	Produces soothing quality for inflamed parts.
Nutrients:	Provide nourishment.
Purgatives:	Cause copious bowel evacuation, more drastic than laxatives.

Stimulant:	Increases or quickens function and action of tissues and systems.
Stomachic:	Strengthens the stomach and abdomen. Increases appetite and relieves indigestion.
Tonic:	Improves body tone by stimulating, invigorating and strengthening.

Preparation of Herbs

Infusion:	The extraction of the medicinal properties of a substance by steeping or soaking leaves or plant parts in water or solvent.
Elixir:	Preparation of sweetened aromatic substance, usually has some alcohol base, used for medicinal and flavoring qualities.
Fomentation:	The use of heat and moisture to body parts to ease pain or reduce inflammation.
Poultice:	A soft preparation heated and spread on cloth and applied to wounds, sores, or inflamed areas to supply warmth, decrease pain or act as counterirritant or antiseptic.
Decoction:	A preparation made from boiling roots and/or seeds in water.
Extract:	A preparation made by a chemist or pharmacist.
Syrup:	A concentrated sugar and herb preparation with or without medicinal qualities.
Tea:	An infusion prepared by pouring boiling water over an herb in a covered nonmetal container, and straining it. Use as medicine or beverage.
Tincture:	An alcohol base solution with herbal substances.

Source for definitions: (McGrath, 1977; Rau, 1980; Rose, 1980; Hutchens, 1974; Hagener, 1977).

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