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


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.

The sample was 25 rural women from Teton County and included a group of Hutterite women. The informants were self-confirmed herb and/or health food users. A personal interview questionnaire was developed from nutrition survey tools from books by Pelletier (1980) and Yura and Walsh (1978). Spradley's (1979) ethnographic interview techniques were utilized during personal interviews and for collection of background data for the study.

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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Date May 27, 1982

# 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

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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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To God for His strength, the nourishment of faith, and for this earth and people to love.

TABLE OF CONTENTS

TABLE OF CONTENTS (cont'd)

TABLE OF CONTENTS (cont'd)

TABLE OF CONTENTS (cont'd)

# LIST OF TABLES

# ABSTRACT

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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 conjuction 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 (USRDAs), 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 $I_8A$ (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 polychlorbiphenyls (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 $B_6$ and $B_{12}$, 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 anticoagulent 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 $B_6$ and $B_{12}$ (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 efficious until proven so" and that "Magical thinking cannot overturn the fundamental axiom of therapy, primum no nocrere - 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