1985

Household production of food, food expenditures and reported adequacy of food

Carol Bennett Volker

Iowa State University

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HOUSEHOLD PRODUCTION OF FOOD, FOOD EXPENDITURES, AND REPORTED ADEQUACY OF FOOD

Iowa State University

University Microfilms International 300 N. Zeeb Road, Ann Arbor, MI 48106
Household production of food, food expenditures and reported adequacy of food

by

Carol Bennett Volker

A Dissertation Submitted to the Graduate Faculty in Partial Fulfillment of the Requirements for the Degree of DOCTOR OF PHILOSOPHY

Major: Family Environment

Approved:

Signature was redacted for privacy.

In Charge of Major Work

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For the Major Department

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For the Graduate College

Iowa State University
Ames, Iowa

1985
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CHAPTER I: INTRODUCTION

Purpose of the Study

The purpose of this study is to examine relationships between activities in the production of household and (1) expenditures for food at home and away and (2) the household’s assessment of the adequacy of the food consumed. Two different measures of household food production are used: activities prior to the final preparation of food, such as gardening, canning, and freezing (primary household food production) and the proportion of the household’s meals during a specific week that were eaten at home (secondary household food production.)

Background

Anyone who is familiar with lawn mowing, house painting, laundering clothes, preparing food, or gardening is familiar with household production. Over the years the nature and amount of household production have changed because households themselves have changed. Employment patterns and opportunities, family composition, technology, and other forces have brought about changes in the choices that members of households may make. All of these choices affect household production activities. Changes that have occurred in households relative to choices that people make in production and consumption today are highlighted in this section.
Changes in family and household composition.

A family is defined as "...a householder and all who are related to the householder who are related by blood, marriage, or adoption" (U.S. Bureau of the Census, 1981). A household is "...all persons who live in a housing unit." The unit that will be examined in this study is the household.

The average size of households has decreased throughout this century. In 1900, the average household size was five persons; from 1920 to 1950, four; in 1960, three (Glick, 1975, p. 24). Part of the decrease in household size is due to decreases in the number of children. Between 1970 and 1980 the average number of children per household (in households having at least one child) decreased from 2.4 to 2.0 (Fuchs, 1983, p. 60).

Choices people make in their living arrangements have also contributed to the decline in the average household size. In 1950, only four percent of single men and six percent of single women headed households. By 1980, 29 percent of single men and 29 percent of single women were living in one-person households (Fuchs, 1983, p. 131). Between 1975 and 1979, only 11.5 percent of new households were headed by a married couple (Masnik and Bane, 1980). Households composed of persons of the opposite sex sharing quarters (not married) almost tripled between 1970 and 1980 (Fuchs, 1983, p. 142).

Some of the decrease in household size has occurred because of the number of older people living as couples or alone. In 1900, people age 65 and over were four percent of the total United States population; in 1960, 9.2 percent (Fuchs, 1983, p. 263.). Part of the larger proportion of
older people is due to longer life expectancies, especially for females. The ratio of females to males over age 65 was .99 in 1920, and 1.48 in 1980.

Changes in household composition have been accompanied by changes in needs and resources. Although on an average, the number of people sharing the household's resources is smaller, the number of people contributing human and material resources also is smaller. Thus, the manner of procurement and preparation of food, a basic need, may have changed, also.

Changes in labor force participation

Household composition is not the only change affecting households. There also have been massive changes in the labor force participation of women. Measured as a ratio of the size of the labor force to the age of the noninstitutionalized population age 16 and over, labor force participation of women increased from 31.8 percent to 52.7 percent from 1947 to 1982. During the same period, men's labor force participation decreased from 86.8 percent to 76.7 percent (Hefferan, 1984, p. 157). In 1978, 55 percent of married women were in the labor force, compared with 63 percent of women who had never married, and 72 percent of those formerly married (Smith, 1979, p. 8).

Currently, the percentage of women who only keep house, by age group is: 18 percent of those age 20 to 24; 26 percent of those age 25 to 34; 27 percent of those age 35 to 44; 32 percent of those age 45 to 55; and 45 percent of those over age 65 (Hodgkinson, 1984). According to Masnik and Bane (1980, p. 4), between 1960 and 1975 two-worker families (husband and
wife) increased from 23 percent to 30 percent of all families. No-worker households increased from 20 percent to 26 percent of all households, and one-worker families decreased from 57 percent to 45 percent, reflecting a drop in one-worker husband/wife households from 25 percent to 14 percent of all households, and an increase in one-worker female head and men and women living alone from 20 percent to 26 percent of all households.

Labor force participation of women is likely to affect the procurement and preparation of food, also. Whether a household has both a male and a female head, or only a female head, if there is no full-time homemaker, there are fewer available hours to do food procurement and preparation. These activities may be eliminated, shortened, or done at the expense of leisure time.

Changes in choices

Some of the changes in households have undoubtedly been brought about by technological change and a larger stock of information. Medical advances and improvements in nutritive intakes have improved the status of health and lengthened lives. But many changes have occurred because of choices people make: to use contraception or not; to marry or not; to divorce or not; or to be employed or not. Although higher incomes have enabled young adults to live independently rather than with their families of origin (Fuchs, 1983, p. 141) it ultimately is a matter of choice.

In order to make decisions, one must choose between alternatives. And rational people choose what they believe will be the best action, given the information they have about alternative resources and outcomes.
Decisions about work and leisure, about lifestyles and about living arrangements, are made by weighing costs and benefits, while considering known feasible alternatives. Constraints limit choices. For example, low educational levels or skills or poor health may limit potential income and/or employment. Some people have more constraints than others. Nevertheless, according to the economic perspective, people try to maximize utility, or satisfaction.

Individuals and families choose what goods and services will give them the most utility. They also choose how they will obtain those goods and services. Will they produce them themselves, or will they spend their earnings to purchase them? What will they have to give up to obtain the wanted goods and services? If they produce them themselves, they give up leisure time or the opportunity to be employed and earn during that time. If they choose to use earnings to purchase goods and services, they also give up potential leisure time and the opportunity to directly produce goods and services for themselves and their family.

Households constantly engage in weighing costs and benefits. They make choices. One such choice is that of the provision of the household's food. What can they spend, considering their other needs and wants? How much will be spent away from home? How much will be spent on food at home? Will they grow a garden, or freeze or can food? Or will they use that time in earning money at a job and purchase fresh or preserved food? How satisfied will the household members be with the food they consume?

This study deals with one of the most basic of human needs: the procurement of food for household members. Regardless of changes that
have occurred in household composition and employment of members, households continue to have responsibility for feeding their members. Household production of food has not disappeared. It has simply changed with other elements of the society. The nature of research on household production activities also has changed throughout the years in an effort to understand and meet current and future needs of individuals and families.

The Need for the Study

For many years home economics researchers have been interested in work within the household. In the 1920s the USDA's Home Economics Bureau began to sponsor studies of housework done by rural homemakers. The purpose of the studies was to measure the time and effort expended and to document the types of activities performed. Those studies provided baseline data for development of work simplification techniques and devices to help relieve the work load of rural homemakers.

Throughout the years the studies continued, with the addition of urban households (Hall and Schroeder, 1970; Manning, 1968; Walker and Woods, 1976; Warren, 1940; Wiegand, 1954; and Wilson, 1929). Recently however, attention has shifted away from work simplification techniques.

The most recent USDA and Experiment Station research was done on a regional basis (Family time use: an eleven-state urban/rural comparison, 1981; Ortiz, MacDonald, Ackerman, & Goebel, 1981; and Sanik, 1983).

Social scientists have also become interested in the nature of household work, what is done, who does it and the time expended (Berk &
Berk, 1978; Morgan, Sirageldin & Baerwaldt, 1966). Effort has also been made to place a dollar value on household production activities, both from a theoretical and an applied viewpoint (Adler & Hawrylyshyn, 1978; Bivens & Volker, 1982, 1984; Gauger & Walker, 1980; Kuznets, 1941; Morgan, David, Cohen, & Brazer, 1962; Morgan et al. 1966; Nordhaus & Tobin, 1972; Sirageldin, 1969; Volker & Bivens, 1983). Such studies have implications for obtaining a more realistic value for goods and services produced within the United States that are not currently counted in the GNP, and for placing a value on work done by homemakers. Although shared responsibility for household work is paid lip service, most studies show that most household work is still done by the female head, whether she is employed, and whether there is a male head or children present (Abdel-Ghany & Nickols, 1983; Berk & Berk, 1978; Geerken & Gove, 1983).

Gardening, production of animal products, fishing, hunting, and food preservation are household production activities that have not been extensively analyzed with respect to their effects on food expenditures, nor the household's satisfaction with the food it consumes. Although not universally done, these are activities that continue to be performed within many households. Households with income constraints may use these activities to augment purchased food. Other households may choose household production activities because they believe they can obtain a better quality or variety of food.

Household meal preparation also is a production activity. There are a number of inputs into the production of meals in the household. First are the human inputs, such as time, energy, and skills that are manifested
in the form of labor and management. A second is that of the services of household durables, such as appliances and cooking and serving utensils. A third is the consumable input of fuel, such as electricity or gas used in meal preparation. And a fourth is the food in the form it enters the preparation process. Households may choose whether to prepare all of their own food, a portion of it, or none at all. Their alternative is to purchase ready-prepared food such as at a restaurant or other food establishment. Thus, the choice is whether to do the production themselves, or to pay for the production process that occurs elsewhere. Each household's choice is made relative to its standards, and its cost relative to constraints, such as time, money, or lack of skills.

There is need for the investigation of the constraints that lead people to do productive activities such as gardening, fishing, canning, and freezing. In addition, there is a need to examine the effects of these activities on household's expenditures for food and their assessment of the adequacy of their food. These activities may not be undertaken only by those with severe constraints; they also may be done for recreation or to improve the quality or selection of their food.

There also is a need for investigating the constraints that affect choices relative to home preparation of meals versus purchase of meals away from home; and the effects that the proportion of household meals prepared at home have on household's expenditures and their assessment of the adequacy of the food they consume.
CHAPTER II. THEORETICAL BACKGROUND AND CONCEPTUAL MODEL

The first part of this chapter consists of theoretical background in microeconomics and sociology as a basis for the conceptual model. Following the theoretical background, the conceptual model will be developed to serve as a basis for the model to be tested and the methods of investigation described in Chapter IV.

The Components of the Theory

A number of economic and sociological concepts are involved in developing the conceptual model. The concepts are: production, household production, consumption, utility, characteristics, standards, norms, preferences, resources, scarcity, opportunity cost, satisfaction, and utility maximization. Some historical background for these concepts will be given, and meanings and applications of these concepts to household behavior will be explained and illustrated.

Production

Production has been defined as "...the creation of utilities, either in the form of services or embodied in some material good..." (Kyrk, 1953). Utility is usually defined as "...the want-satisfying power of a good" (Reid, 1934).

In his treatise, The Wealth of Nations, Adam Smith (1776/1937) stated, "The annual labour of every nation is the fund which originally supplies it with all the necessaries and conveniences of life which it annually consumes...," and "...This proportion must in every nation be
regulated by two different circumstances: first by the skill, dexterity and judgement with which its labour is generally applied; and, secondly, by the proportion between the number of those who are employed in useful labour and that of those who are not so employed." Thus was established the link between the employment and productivity of labor and the creation of utility in the form of consumable goods. Smith's recognition of labor's crucial part in production did not, however, extend to production of services. He distinguished between "productive" and "unproductive" labor.

There is one sort of labour which adds to the value of the subject upon which it is bestowed: there is another which has no such effect. The former, as it produces a value, may be called productive; the latter, unproductive labour. Thus, the labour of a manufacturer adds, generally, to the value of the materials he works upon...The labour of a menial servant, on the contrary, adds to the value of nothing...The labour of some of the most respectable orders in the society is, like that of the menial servant, unproductive of any value, and does not fix itself in any permanent subject or vendible commodity, which endures after the labour is past... (Smith, 1776/1937, p. 314-315).

Smith's perception of what constitutes "productive labour" was quite probably clouded by the pre-industrial revolution's fixation on wealth in the form of gold and silver, treasures that could be possessed and held. His recognition of the productivity of labor and a nation's labor force being wealth was a new and unique idea to the world in 1776. The idea that the outcome of productive labor must result in goods (not services) persisted. John Stuart Mill (1906) recognized that labor produces both goods and services that are of value. Nevertheless, he continued to distinguish "productive labor" from other labor.
Now the utilities produced by labour are of three kinds. They are: First, utilities fixed and embodied in outward objects...Secondly, utilities fixed and embodied in human beings: the labor being in this case employed in conferring on human beings, qualities which render them serviceable to themselves and others. To this class belongs the labour of all concerned in education...Thirdly and lastly, utilities not fixed or embodied in any object, but consisting in a mere service rendered; a pleasure given, an inconvenience or a pain averted, during a longer or shorter time, but without leaving any acquisition in the improved qualities of any person or thing...
(Mill, 1906, p. 73-74).

It is curious that Mill recognized the value of production of human capital in the form of education (although the term, "human capital" was not yet in use), but continued to separate out the production of material goods as the only "productive" form of human labor, because only that form of production produced goods, or wealth.

I shall, therefore, in this treatise, when speaking of wealth, understand by it only what is called material wealth, and by productive labour only those kinds of exertion which produce utilities embodied in material objects...By unproductive labour...will be understood labour which does not terminate in the creation of material wealth; which...does not render the community, and the world at large richer in material products, but poorer by all that is consumed by the labourers so employed. (Mill, 1906, p. 76-77).

Although economists since Mill have recognized that utility is produced by production that produces services, the separation of goods and services often remained as an artifact. For example, the Department of Labor for many years used "production workers" to differentiate workers who produced tangible goods from those in the service sector. Even now, labor is classified as "goods producing" and "service producing." Gould and Ferguson (1980) point out that it is much simpler to specify the precise inputs and to identify the quantity and quality of output in the
production of goods than in the production of services. Thus, most
general microeconomics texts deal with production of goods.

Household production

The most commonly used definition of household production is "The
unpaid activities carried on by and for the members of the family" (Reid,
1934). Reid considered household production activities to be those that
might be replaced by market goods or paid services, "...if circumstances
such as income, market conditions, and personal inclinations permit the
service being delegated." She considered shopping, child care,
management, budgeting, and housework as productive work, but family and
social relationships as not.

Fitzsimmons and Williams (1973) defined household production as
"...any activity that is not paid for and is performed by members of the
household to create utilities for themselves or other household members
which could have been delegated to others if the choice had been made to
do so." (p. 60) Although both Reid and Fitzsimmons and Williams made a
strict interpretation of household production producing only goods and
services by and for the household that in the absence of constraints could
be replaced by market goods and services, others have taken a broader
view. Beutler and Owen (1980) extended household production activities to
those activities carried on by and for household members that are not
possible to delegate effectively to a paid worker because of the unique
attributes and relationships involved in those activities. They call
those activities "inseparable home production", as contrasted with the
activities that could be delegated to a paid worker (separable home production). Inseparable home production is unique to the family; it has intrinsic characteristics dependent upon an individual's perceptions. It contributes to the development of human capital by transmitting feelings of belonging, esteem, and altruism.

Consumption

Adam Smith (1776/1937) declared, "Consumption is the sole end and purpose of all production." (p. 620) In this context and at that time, consumption was thought of as the "using up" of goods. By Thorstein Veblen's time, however, the concept of consumption had been extended to the use and enjoyment of services as well as goods. A main component of Veblen's "conspicuous consumption" was the keeping of servants (Veblen, 1899/1973). Thus, consumption has been thought of as the enjoyment of goods and services.

Davis (1945) defined consumption as "...the commodities, their uses, and services consumed". Davis pointed out that consumption includes: (1) having available as well as using free goods of nature and public goods that are utilized without charge; (2) self-service and mutual service; (3) purchased commodities and services; and (4) the use of semidurable and durable goods owned or rented. Thus, although much of consumption includes an expenditure factor at one time or another, it does not always require the expenditure of money. The use of household-produced goods and services, gifts, stocks of consumables, and the use of items or services acquired by bartering are also "consumption".
The level of consumption is "...a sort of aggregate of the food, fuel, and other nondurable goods used up, the services of houses, automobiles, clothing, and other durable and semidurable goods utilized, and the services of human beings used by an individual or group in a given period of time" (Davis, 1945).

Utility

Just as production is done to provide commodities for consumption, consumption itself is just another link in a chain. For consumption is done to satisfy needs, or wants; the economic concept for that satisfaction is termed "utility".

Consuming units, either individuals or households, derive satisfaction, or utility from the services provided by the commodities consumed during a given time period (Gould and Ferguson, 1980). Although very early economists believed utility could be cardinally measured (Bentham, 1789/1843), as time passed, the concept of utility was not restricted to cardinality. Therefore, the utility function was written:

\[ U = U(X_1, X_2, \ldots, X_n), \]

where \( X_1 \) is the rate of consumption of commodity 1. Thus, various commodities can be combined to produce utility, and they may be substituted for each other in varying amounts to produce equal amounts of utility, given constraints. This assumption is represented in economists' indifference curves.

Because utility is the desired outcome of consumption, it is evident that consumption, per se, is not the sole and end purpose of all
production, as declared by Adam Smith (1776/1937). Indeed, utility may be too narrowly defined when it is declared to result from the consumption of goods and services. Becker (1965) introduced an idea that served to broaden the scope of the microeconomic theory of the firm, extending it to the household and individual arena. He proposed that satisfaction (utility) may result from activities in general, and is not limited to consumption activities alone. Thus, according to Becker's theory, people can gain satisfaction directly from eating, recreation, sleeping, and also from work or production. The end product and purpose for any economic activity of an individual or household, then, is satisfaction, not consumption.

Characteristics

Still unexplained is how activities produce satisfaction and how alternate activities can produce identical levels of satisfaction or utility. Lancaster (1971) contributed to consumer theory when he proposed that goods and services (commodities) themselves were not what utility was obtained from, but rather the characteristics embodied in them, such as nutrition, flavor, color, prestige, etc. Thus, certain characteristics might be found in widely different commodities, or similar commodities might have somewhat different proportions of similar characteristics. Characteristics serve as components of a utility function, and can be preference-ordered. The concept of preference ordering indicates that people are able to recognize these characteristics and weight them in some way. The scale of measurement is the standard they expect. People hold
standards for their scale of living, but also for individual characteristics of commodities that are components of their scale of living.

**Standards, tastes, preferences, norms, and utility**

Devine (1924) defined the standard of living as,

> ... All those things one insists upon having. ... Each individual has his own standard, determining every choice he makes. Each family has its own. ... Each locality and each nation has its standard, produced by the interplay of an infinite number of economic, social and psychic forces. (p. 1)

Devine's definition and explanation indicate that although standards are held by each individual, those standards are not identical for all. He also indicated that they arise from a number of sources.

Standards are not to be confused with ideals or perfection. People are capable of being quite rational in their assessment of their own situation and in setting standards for themselves and their families. Kyrk (1953) asserted:

> There is a standard other than the ideal standard. There is a scale of preferences, a code or plan for material living that satisfies our sense of the necessary, the decent, the tolerable, although it does not represent our ideal. (p. 374)

The standard of living and the standard of consumption are often confused with and erroneously used in place of "level of living" and "level of consumption". Davis (1945) made a clear distinction between the terms. He stated,

> The chief distinctions to be drawn are between consumption and living and between level and standard. The basic concepts are four: (1) consumption level, (2) consumption standard,
(3) level or plane of living, and (4) standard of living in the strict sense. . .

Consumption means the commodities, their uses, and services consumed. Living includes consumption and much more: working conditions, cushions against major and minor shocks, freedoms of various kinds, and what I tentatively call "atmosphere". The level of consumption or living, as I see it, is that actually experienced, enjoyed or suffered by the individual or group: the standard of consumption or living is the level that is urgently desired and striven for in respect to quantities, qualities, and proportions of the various goods consumed or wanted for consumption. (Davis, 1945, pp. 2-3)

Davis went on to say that a rise in the consumption level means an increase in the value of actual consumption and/or an improvement in its quantity. It is apparent from Davis' discussion that standards are set as a goal to be achieved. Although they may be rational in setting them, people do not automatically meet their standards, nor do they necessarily meet them when striving for them.

Unanswered in Davis' discussion of the source of standards is why standards are quite similar for so many people. In addition, he does not delineate the basis people use for setting their standards for the quality, quantity, or particular mix of characteristics they choose for the goods and services they consume.

Tastes and preferences Although the field of economics has developed a great deal of theory about indifference curves, it has not, in general, been specific about why people select the goods and services that they do, or why they adopt particular lifestyles. Microeconomic theory generally assumes that people choose what they want on the basis of "tastes and preferences", and that particular tastes and preferences are peculiar to each individual.
With one exception, tastes and preferences are generally treated by microeconomists as an unmeasured exogenous variable. The exception is that consumer economists sometimes center their investigations on the influence of personality traits or the psychological makeup of the individual consumer. In this case, tastes and preferences are indicated by what the consumers choose to consume.

Devine (1924) referred not only to psychological underpinnings of consumer standards, but to social ones. The culture has a role in the development of people's wants and the standards they set. Kyrk (1953) stated, "Our wants are culture products and represent culture traits. The individual regards these as in part imposed from without and in a sense compelling him to live in a particular way." (p. 376)

A culture imposes the standards people set for themselves by having rules for how people "ought" to behave in particular circumstances. These rules, both formally and informally enforced, are called "cultural norms". Cultural norms have been defined as rules or standards, both formal and informal, for conduct and life conditions of members of a particular society (Williams, 1970).

Norms, then, as defined by Williams (1970) and others, are almost identical to Davis' definition of standards. They are prescriptions of what should be desired and sought by individuals and households. Cultural norms are the prescriptions of a particular society for its members. The standard of living of a specific society is a set of norms about conditions, services, and goods that should be enjoyed by households.
within that society. In this context, standards can be viewed as being identical to sociologists' norms.

Morris and Winter (1978, p. 33) state, "Conclusions about the existence of cultural norms may be based on testimony regarding standards for behavior and the occurrence of sanctioning behavior, but not the behavior being sanctioned." Thus, to assess and identify cultural norms, the researcher must not be satisfied merely to observe and record behavior, or to use revealed preferences. It is imperative that the researcher avoid concluding that the behavior of individuals within a society is necessarily an expression of norms.

Individuals and households within a society may develop norms that are different from the cultural norms. That some households set different norms for themselves is not evidence that cultural norms do not exist. For some households within a society, the cultural norms simply are not relevant; but for the majority of the households, cultural norms do represent what ought to be achieved or performed. Thus, the best estimate of the standard of living, as defined by Davis (1945), for a particular household, is the set of cultural norms for goods, services, and conditions.

Norms, tastes, preferences, and utility  Beutler and Morris (1983) and Morris and Winter (1985) have equated the economic terms of "tastes" and "utility maximization" with the sociological ones of "norms" and "satisfaction". Morris and Winter (1985) say that cultural norms state what people "should" want. Norms do not refer to what is preferred over other things; but rather, what "should" be wanted, according to cultural
prescription. These norms, they say, are the "tastes" referred to by economists. "Preferences", according to Morris and Winter (1985), are the relative degree to which two or more goods are desired, given constraints. Thus, the economist's budget curve serves as a constraint. However, other things can serve as constraints. The lack of resources such as skills, education, good health, and experience can prevent people from achieving a normative condition. When constraints are present, according to Morris and Winter (1985), a psychological process within the person examines potential choices in the light of norms and resources. Preferences emerge as a result.

Resources, scarcity, and opportunity cost

Among the most important constraints that households face when attempting to obtain the conditions prescribed by the norms or standards are resource constraints. Economics is usually defined as the study of how scarce resources are used to satisfy competing ends. Resources that are available to individuals and households are of many kinds. In the aggregate, they are a stock of wealth that may be employed to achieve utility. The lack of a sufficient or desired amount of resources (with respect to the norms or standards) is a constraint. The causes of utility are the characteristics embodied in the commodities. All potential combinations of characteristics may be ordered preferentially. In order to achieve utility, a household makes use of its resources to achieve the level of its standard.
Such resources are of three kinds. First, human resources are the primary source of family wealth. These consist of such things as skills, physical strength, intelligence, education, etc. These must be combined with time to achieve utility. Most human resources themselves are not depletable; i.e., intelligence and education are not diminished as they are used. However, when combined with time, they are limited. Some consider time a resource in itself; like others, it is limited, but unlike others, it is initially equally distributed among all persons. The second type of resource is money income or money stocks. Income is received either in exchange for human time and skills in employment or from non-wage income. Money is a resource because it serves as a medium of exchange for present or future consumption of goods and services. Third is physical capital. Durable goods and housing enter into the production function to produce utility.

Time

Traditional economic theory placed time in the production sector, because of its relationship to wages paid to labor. More recent theory takes into account time as a scarce commodity in both production and consumption activities (Becker, 1965, 1981; Linder, 1970).

Within the household, time enters into both consumption and production activities. Households can choose between current or delayed consumption. Delayed or future consumption can be accomplished in several ways: by using savings, by consuming more than usual while saving less, by borrowing or using credit, or by producing more. If the household members choose to produce more, they can either choose to work more in
market activities to earn additional money, or they can produce more goods and services within the household.

**Opportunity costs** The notion of scarcity means that households make constrained choices. If scarce resources are used to obtain one thing, they are not available for another. If money is spent for one good or service, it is no longer available for another. If time is used in conjunction with employment, it is not available for leisure or other production or consumption activities.

Opportunity cost has been defined as "... one estimate of value of returns foregone when the decision is made to use resources for any specific purpose. ..." (Fitzsimmons and Williams, 1973, p. 24). The opportunity cost of employment is the foregone opportunity for leisure or household production activities. The opportunity cost of household production is the foregone opportunity of other activities, perhaps employment. Each household makes choices about how their resources may be best used to obtain utility, meeting their needs, and their desired standard. There are many needs to be met. Thus, the goal is to obtain as much utility as possible, given scarce resources; i.e., to maximize utility within constraints.

**Norms and utility**

Microeconomic theory emphasizes maximization. In the firm, the motive is maximization of profits. Inputs are carefully calculated to minimize costs while achieving optimum output. Within the household, maximization of utility is the goal.
The concept of satisfaction, widely used in the quality of life literature, (Campbell, Converse & Rodgers, 1976; Andrews & Withey, 1976) can be seen to be essentially similar to the concept of utility, as found in the economic literature. Individuals and households are assumed to engage in activities that increase satisfaction and maximize utility.

In theory, the household aspires to meet a particular set of norms. Although there are some differences, the majority of households within a particular culture aspire to achieve the norms that are defined by the culture as a whole. These norms are translated into bundles of characteristics that are embodied in goods and services that can be ranked preferentially by the household.

The household is constrained by limited resources, however, and so is forced to make constrained choices based on both the norms and the resources available as well as the opportunity cost of using specific resources. A household chooses the best combination of resources to maximize utility or satisfaction. They must choose, for example, what to buy, what to produce for themselves, and how to produce it, given their constraints.

Utility is maximized (high levels of satisfaction are reached) when the norms that are held by a household are achieved. If norms are not met, households will (1) reorder and adjust resources to meet norms; or, if no further readjustment can be made because of constraints, (2) alter their standards (Beutler and Owen, 1980).
The Conceptual Model

Based on the theoretical background, some generalizations can now be made, and a theoretical model constructed (Figure 1).

Influenced and constrained by household composition, resources, and constraints, households attempt to maximize utility (satisfaction) and meet their standards by performing certain productive activities, which, in turn, affect expenditures for food. Families choose whether to home-produce foodstuffs (primary household production) that will later be used in meal preparation activities. Meal preparation itself (secondary household production) is influenced by household composition, resources, and constraints, which may affect expenditures and numbers of meals purchased and consumed away from home. Both primary and secondary household production can affect expenditures for food and the family's report of the adequacy of their food as they assess it relative to their standard for food.

It is necessary to ascertain which factors influence and constrain household production behavior in order to control those factors when testing a model. With the theoretical model now in place, relevant studies will be examined.
Figure 1. Conceptual model
Previous research in household production has generally been limited to assessing time inputs into specific household production activities and to developing methods of placing monetary values on the output. Investigations of household food preparation activities have centered on characteristics of households relative to the number of meals eaten away from home. Few studies have investigated the relationship of household production activities to households' satisfaction with their food or the households' reported adequacy of the food consumed. This chapter reviews the literature relative to valuation of household production, family members' responsibilities for tasks, time spent in household production activities, household food expenditures at home and away, and households' assessments of their consumption relative to a norm.

Valuation of Household Production

There has been much interest over the years in placing a monetary value on production done within the household. The methods used may be characterized as either input-based valuations, which are based on imputed wage rates for the persons doing the household production; or they may be output-based valuations, in which the values of the finished products are ascertained.

Input-based valuations

Labor is an input into the production process. Thus, the valuation of labor in production may be termed input-based valuation. The imputed
value of household labor and management has been useful for arriving at settlements in litigation over wrongful death and in marital dissolution (Hauserman & Fethke, 1978). The value of labor inputs into household work has been analyzed in several ways. One, the replacement cost method, values labor time by the cost of hiring a substitute worker, or domestic servant, such as a housekeeper or child care-giver who works in the home (Hawrylyshyn & Woroby, 1982; Kuznets, 1941; and Murphy, 1980). Problems with using this method are the relative scarcity of such workers, the problem of establishing a market value, and the different responsibilities held by such workers in different households. In addition, it excludes much of the management portion of household work and assumes that the substitute worker is a perfect substitute (Zick & Bryant, 1983).

A second method is the market cost method (Murphy, 1980). Time inputs for individual services are valued at the wage rates of people who perform that type of service in the market, such as the cost of a cook in a restaurant, a child-care worker, a dishwasher, etc. (Gauger and Walker, 1980; Murphy, 1980; Sirageldin, 1969). The problem with this method is that of valuing simultaneous production; i.e., when child care, laundry, and food preparation are being accomplished by the same person at the same time. It also ignores much managerial activity.

A third method, the opportunity cost method, uses the at-work wage rate of the household member(s) doing production within the home. The most pressing problem with this method is how to value the time of a worker who is not employed. Ferber and Birnbaum (1980) use as a proxy the wages of similar individuals who are employed. Ferber and Birnbaum point
out, however, that this method provides only a lower bound on wage values. Zick and Bryant (1983) have developed an improvement on the opportunity cost method by using a reservation wage, as first suggested by Heckman (1974). They believe their measure is superior to the previously used alternative cost method. Other researchers have imputed wages based on the husband's income and other household characteristics (Gronau, 1973), average earnings (Murphy, 1982), or median female earnings (Weinrobe, 1974).

Output-based valuations

Another approach to valuing household production is motivated by a wish to better quantify the value of the goods and services that are produced, yet not represented in the GNP. The GNP is purported to be a measure of all goods and services produced in the United States, but includes only those that pass through the market system and are thus done for pay. This approach is an output-based method. Time spent in activities is not measured nor valued. Rather, the method places a value on the goods and services that are produced. This value is produced by the labor and management of the household member(s) doing the productive activity, by the services of durable goods such as appliances, and by other inputs such as fuel.

A few studies have examined the value of output. Morgan, David, Cohen, and Brazer (1962) examined the production of home-grown foods and home additions and repairs. The market value of the finished products was
assessed by asking the respondents, "How much did you save by doing these things yourself?"

Sanik and Stafford (1983) examined the value of output in household food preparation in a product-accounting approach in which the values of foods prepared and consumed in the home were equated with prices from a university food service. The construct was good, but their findings tended to be somewhat skewed downward. Two problems seem to be apparent, caused by data limitations. One was that many substitutions of foods were necessary when the foods that were consumed at home were not served at the university food service. Second, in the absence of information on food intake quantities, they assumed that each person ate only one serving of each food, which well might not be the case. They did not attempt to compare the value of the final product with that of food before processing.

Other studies have attempted to measure the value added in the household production process (Bivens & Volker, 1982; Bivens and Volker, 1984; Volker & Bivens, 1983). In these studies, the value of food as it entered the kitchen was subtracted from an imputed value of the food as served in the home. As with Sanik and Stafford (1983), the value of the prepared meals had to be imputed. In this case, it was imputed for each household from the value of the meals eaten away from home. The resulting value added represents the contribution of labor and management, the services of household durables (appliances and cooking and serving utensils), and fuel inputs. An estimate of the contributions of household durables and fuel to value added was made using averages from aggregate
data. Average weekly value added was found to be $40.28 per household in 1977. The average weekly contribution of household durables was estimated to be $4.12; and average weekly contribution of fuel inputs was estimated to be $2.39 (Volker & Bivens, 1983). Value added was significantly positively affected by household income, age of the head, and household size. It was significantly negatively related to employment of the female head. Thus, those households in which the female head (with or without spouse) was employed had less value added (Volker & Bivens, 1983).

Responsibilities for Household Tasks

Research has indicated rather consistently that household work is done primarily by females (Berk & Berk, 1979; Hill and Juster, 1980; Meissner, Humphreys, Meis, & Scheu, 1975; Nickols & Metzen, 1978; Walker & Woods, 1976; Lovingood and Firebaugh, 1978). Nye (1976) found that nearly all husbands and wives reported that the housekeeper role was more often performed by women than by men. The housekeeper role includes decisions related to food, selection of food, and its preparation. Researchers investigating the influence of wives' employment on the performance of tasks have generally found that wives' employment outside the home seems to reduce the tasks they are responsible for; however there is little or no change in the number of tasks for which the husband is responsible. Stafford and Duncan (1979) stated that the proportion of husbands who have primary responsibility for any housekeeping tasks is only about 16 percent. Brubaker and Hennon (1982) found that the responsibility for family social events and earning money were the only equally shared tasks
among dual-earner families. Men were responsible for car maintenance and lawn work, and women were responsible for cooking, washing dishes, laundry, writing letters, cleaning house, and marketing.

Erickson, Yancey, and Ericksen (1979) found that if a wife is employed only part time she is less likely to share housework with her husband than if she is employed full-time. However, in their review of the literature, Hofferth and Moore (1979) concluded that there is little evidence that task sharing is related to the wife's employment outside the home.

Berk and Berk (1978) found that with all other variables controlled, only the wives who are employed in the highest-status occupations do a small proportion of the household tasks, and husbands in occupations with high status do a slightly higher proportion of household tasks than those in low status occupations. Ericksen et al. (1979) found that high income husbands are much less likely to do housework than those with lower incomes. Model (1981) found that high-income husbands contribute more to housework if they are married to wives who also have high earnings.

Abdel-Ghany and Nickols (1983) found that differences in socioeconomic characteristics between husbands and wives explain only part of the differential between husbands' and wives' household work. They argue that persisting role expectations explain the major part of the variance.
Time Spent in Meal Preparation Activities

The strongest predictor of housework time of wives has been hours of paid employment (Hafstrom & Schram, 1983; Nickols & Metzen, 1978; Vanek, 1974; Walker & Woods, 1976). Likewise, the time spent in employment has been found to have a significant effect on time spent in meal preparation activities (Goebel & Hennon, 1983; Ortiz, MacDonald, Ackerman, and Goebel, 1981; Vanek, 1974; Walker & Woods, 1976).

Goebel and Hennon (1983) found that employed wives who lived in urban areas spent less time in meal preparation and cleanup than those who were not employed. In rural households, there was no significant difference in time spent.

Many studies were limited to husband-wife families with children. In these, the age of the youngest child has been found to affect the time spent in meal preparation (Hall and Schroeder, 1970; Ortiz et al., 1981; Stafford & Duncan, 1979; Walker & Woods, 1976). Goebel and Hennon (1982) did not find a relationship in a 1982 study, but in a later study (Goebel & Hennon, 1983) found that for urban households, a curvilinear pattern was apparent, with the most time in meal preparation and cleanup spent when the younger child was between age two and five. For rural households they continued to find no relationship.

Goebel and Hennon emphasized that the amount of time the woman spends in employment has a greater impact on the amount of time spent in meal preparation and dishwashing than does the family structure variable of age of the youngest child. And the differences in mean time consumed in meal preparation and dishwashing across the various categories of the women's
employment time is greater in both their urban and rural samples than are
the differences accounted for by the age of the youngest child categories.
It seems that women do make choices about resource allocation and trade­
offs between wage-earning and food preparation roles. Women who spend
more time in wage earning spend less time in the tasks of meal preparation
and dishwashing.

Strategies for Dealing with Scarce Time

Strober and Weinberg (1980) have suggested five strategies that
employed wives may use to reduce time pressures in at-home production:
(1) substitute capital equipment for labor (2) substitute the labor of
others (3) reduce the quality or quantity of household production or
become more efficient (4) reduce time in community or volunteer work,
and (5) reduce time allocated to leisure and/or sleep. The first three of
these have implications for this study. They can be re-categorized into
the following specific strategies for reducing time in meal preparation:

- Substitute capital equipment for labor
- Substitute the labor of others
- Substitute meals away from home for home-produced meals
- Substitute convenience foods for time-consuming ones

Substitution of capital equipment

Do employed females substitute time-saving appliances for labor time,
i.e., do they own more household durables in the form of appliances?
Strober and Weinberg (1980) found that when income and life cycle were
controlled, a household that had an employed wife was no more or less
likely than a family with a nonemployed wife to purchase time saving
durable appliances, nor to spend more or less money on those appliances. Weinberg and Winer (1983) were surprised at the results and tried to replicate the study. Their findings were the same: wives' employment status is not significantly related to expenditure levels for time-saving appliances. Nickols and Fox (1983) also corroborated Strober and Weinberg's findings. They found that female employment made no difference in ownership—income is the pervasive influence. Cross-sectional data may not be adequate for assessing the relationship, however, because the effect may be indirect. Households in which the female head becomes employed may purchase time-saving durables at the same time that family income rises due to her employment. Thus, a control on income obscures the dynamic effect. Certain appliances, such as ranges and refrigerators are almost universally owned. One would expect them to be owned regardless of employment status. Others, such as dishwashers, seem to be increasingly part of the stock of households that can afford to purchase them.

Substitution of the labor of others

The second strategy proposed for reducing time pressures is substituting the labor of others for that of the employed female's home work time. Other family members may increase their participation in household tasks. As indicated earlier, husbands contribute relatively little more time to household tasks when a wife is employed. And if she has no husband, that is certainly not an alternative.
Another alternative is more complete participation by children in the household. However, research has not shown a significant contribution by children, either. Lawrence, Tasker, and Babcock (1983) found that adolescent family members averaged 71 minutes per day in household work. Most of the time was spent in shopping, followed by maintenance of the home, yard, car and pets, housecleaning, and meal preparation and dishwashing. Of the 71 minutes, an average of 10 minutes per day was spent in food preparation activities, and five minutes per day in dishwashing. No count was made of gardening activities.

Stereotyped sex roles were apparent. Female adolescents spent an average of 13 minutes per day on food preparation compared with seven minutes for males. Females spent an average of eight minutes per day on dishwashing compared with three minutes for males. Berk and Berk (1978) concur that neither husbands' nor children's time has been substituted for wives'. And there has been no evidence that households hire others to share household tasks to any great degree (Fox & Nickols, 1983, Walker & Woods, 1976).

**Substitution of meals away from home**

A third strategy is for households to substitute meals away from home for home-prepared ones. Hafstrom and Schram (1983) reported that eating out with the family saved the wife about 22 minutes in housework. However, the question a family must answer, is "How much time did eating out take?" In all but the quickest fast-food establishments that are located very close to home, total time spent in travel and waiting for...
service quite probably exceeded 22 minutes. Thus, the household members
must decide whether the time saved in meal preparation was worth the
opportunity cost in time for eating out. Is substitution of meals away
from home for home-prepared meals a rational maximization of utility? If
eating out is considered recreation, or a response to being "too tired to
cook", the answer may be "yes". If the motive for eating out is the
saving of time, the answer may be "no".

Rizek and Peterkin (1980) found that eight out of ten meals eaten in
families that have employed female heads are eaten at home. However,
those households purchased a higher percentage of their meals away from
home (14 percent of all meals) than households in which the female head
was not employed (8 percent of all meals). Lunches were found to be the
meals most frequently eaten away from home. Sixty-eight percent of the
noon meals eaten by the employed female head were from the home food
supplies, compared with 80 percent for other households.

There is some evidence that households in which the female heads are
employed consume more meals away from home (Prochaska & Shrimper, 1973;
Rizek & Peterkin, 1980). Redman (1980), however, did not find that they
did. In a stepwise multiple regression using a sample of husband-wife
two-child families, Nickols and Fox (1983) found that some aspects of a
wife's employment had significant effects on purchases of breakfasts,
lunches, and dinners away from home. Income and wife's employment hours
equally influenced the number of purchased breakfasts, although breakfast
was the meal purchased least often. Although age of the younger child had
the greatest effect on the variation in the number of lunches purchased
away from home, income and wife's occupational status also contributed to explaining variation in purchase of lunches. Families with wives in both high-status and low-status occupations were more likely to purchase lunches away from home than were families of nonemployed wives. Families that had older children were more likely to purchase lunches and dinners than families that had younger children, and the number of hours of the wives' employment positively affected the number of dinners purchased.

However, Nickols and Fox (1983) concluded that the purchase of meals away from home did not seem to be a time-buying strategy that families with employed wives were using. They also found that the purchase of meals at fast-food outlets and school cafeterias were positively related to employment of the wife. They concluded that time-saving features of eating at fast-food establishments as opposed to restaurants may have been a strong determinant for time-pressed employed-wife families when choosing where to eat. The wife's employment was not found to be related to purchase of meals in restaurants; but rather, family income, husband's employment in a high-status occupation, and the age of the younger child were positively related to the number of restaurant meals.

Substitution of convenience foods

The time studies previously reviewed indicated that households that had employed female heads spent slightly less time in meal preparation. This finding could be interpreted in three ways: (1) that they prepared fewer meals (2) that they prepared fewer foods per meal, or (3) they served meals that required less preparation time. This last
interpretation may mean that they use foods with fewer ingredients or the preparation of these foods does not require time-consuming techniques. However, it may mean that they have used partially prepared foods, "convenience foods." Hull, Capps, and Havlicek (1983) examined foods ranked at four convenience levels and their relationship to selected household characteristics. The levels of convenience foods were: (1) nonconvenience foods (2) basic convenience foods, (3) complex convenience foods, and (4) manufactured convenience foods. These, ranging from raw, unprocessed foods to ready-to-eat in convenience levels, also approximated the amount of preparation time required for their use.

Hull et al. (1983) compared both male and female food-preparing household heads, classified as to their employment status and that of the other household head (if there was one). "Market-oriented meal preparers" were those who were employed. "Nonmarket-oriented meal preparers" were those who were not employed and the household did not have another head. "Half-market-oriented" preparers were those who were not employed but the other head was.

They found that female meal preparers used more nonconvenience foods and fewer convenience foods than male preparers. Nonmarket-oriented meal preparers of either sex used more nonconvenience foods, and fewer convenience foods. Hull et al. (1983) state that these findings are consistent with the theory that men are expected to be less labor-efficient at meal preparation than women, and wage-earners are expected to have less discretionary time than nonwage earners.
Hull et al. (1983) also examined the use of convenience foods relative to the value of time of the meal preparer. Weekly earned income was used for the value of time of the market-oriented preparers. For the half-market-oriented meal preparers, the weekly earned income of their spouse was used as a proxy for the value of their time. It was not reported what was used as a proxy for the nonmarket-oriented meal preparers. The researchers found that for both the half-market oriented and nonmarket-oriented females, the higher the value of their time, the more they spent on convenience foods. And convenience foods, due partially to pre-processing, are generally more expensive than others. Market-oriented male meal preparers had value-of-time elasticities with signs that ran opposite to those for the nonmarket-oriented females. Hull et al. (1983) explained that therefore, market-oriented females and nonmarket-oriented males have characteristics that have offsetting impacts on their value of time elasticities. Several factors were offered as explanations: working male preparers tend to rely heavily on convenience foods regardless of the value of the preparer's time, and they also tend to represent small households where away-from-home consumption may be a substitute for at-home food consumption as the value of time increases. However, they explained, as the value of the nonemployed female preparer's time increases, she substitutes time-saving convenience foods.

Households that have a scarcity of time due to employment look for ways to conserve time in production activities. But households may choose to spend nonemployment time in additional productive activities. They may improve the quality, quantity, or variety of the foods they consume by
growing and preserving what they consider to be superior foods; or they may be able to decrease their expenditures for food by home-producing a portion of it.

Growing and Preserving Food

In most of the literature on household production, it has been used as a dependent variable, either alone or in conjunction with time. Little research has been done using household production as an independent variable, and little has been done on such activities as hunting, fishing, or preserving food.

One study that used some of these activities was a study done by the United States Department of Agriculture (Kaitz, 1977). It was found that 46 percent of the 1400 households interviewed in a nationwide sample planted a vegetable garden. Fifty percent of those who planted a garden did so because they preferred the taste of the food, 40 percent did it to save money, and 33 percent did it as a hobby. Because respondents could give more than one reason, percentages sum to more than 100 percent. Those in rural areas, those with larger households, and those with lower incomes were more likely to have a garden to save money. Those with smaller household size and higher incomes were more likely to view it as a hobby.

Johnson (1976) noted a study that used canning and freezing as independent variables, with costs of food as dependent variables. The study was done by R. B. Klippstein and E. W. Wallace at Cornell University and indicated that food frozen at home cost more than commercial frozen
Food purchased and consumed as needed. Costs in the study included amortization of freezer costs, freezer operating costs, and packaging materials. The study indicated that canning might or might not save money, depending upon what equipment was on hand and whether the produce was home-grown or purchased. If the produce was home grown and no labor costs were included money would be saved by canning.

Volker (1979) used household production as an independent variable in a path analysis to analyze its effect on expenditures on food, the family's perception of its food compared to a standard or norm, and their satisfaction with the quantity and variety of their food. She found that those households that produced their own food through gardening or food preservation activities spent less for food and saw their food as being of greater variety and quantity of food than that of "the average Iowa family". Their satisfaction with their food was not found to be related to household production of food.

Food Expenditures and Number of Meals Purchased Away from Home

Expenditures for food vary between households. A number of studies have investigated household characteristics that are related to food expenditures at home and away.

Bowen (cited in Goebel and Hennon, 1983) reported that meals away from home accounted for 24 percent of the food dollar in 1977, and they were 2.6 times as costly as home-prepared meals. In recent years, consumer expenditures on food purchased and eaten away from home have increased somewhat faster than expenditures for food eaten at home.
Expenditures for meals away from home have consistently been found to be positively related to household income (Goebel & Hennon, 1982; Kinsey, 1983; Prochaska & Schrimer, 1973; Redman, 1980; Rizek & Peterkin, 1980; Stafford & Duncan, 1979). Prochaska and Schrimer (1973) found that the income expenditure elasticity for expenditure on food away from home was larger than the quantity elasticity.

Kinsey (1983) found that the income elasticity for expenditures on food away from home was less than one, indicating that food purchased and eaten away from home is not a luxury for all households and that income elasticities rise with income. Smallwood and Blaylock (1981) reported that a ten percent increase in income results in an increase of over eight percent in expenditures for food away from home, but only a 1.5 percent increase in the cost of food purchased for use at home. Fourteen percent of total food expenditures was spent on food away from home in households that have annual incomes below $5000, compared with 29 percent for households having annual incomes of $20,000 or more (Consumer and Food Economics Institute, 1979).

As indicated before, there is mixed evidence on the effect of employment of the wife on the number of meals consumed away from home. Several studies indicate that the employment of the wife does not have an effect on expenditures for food away from home (Goebel & Hennon, 1983; Kinsey, 1983; Redman, 1980; Sexauer, 1979). Thus, there is not substantial evidence that employed wives substitute numbers of meals away from home for time, nor that they increase expenditures on those meals.
The presence of a school-aged child has been found to affect the number of meals eaten away (Prochaska & Schrimper, 1973; Nickols & Fox, 1983). Nickols and Fox (1983) indicated that the number of school lunches is positively and significantly affected by the age of the youngest child. Considering the ubiquity of school lunch programs, the conclusion seems obvious. Although households may choose whether they will send a lunch or have their children participate in the school lunch program, participation in school lunch programs is quite universal, regardless of geographic location or socioeconomic level. Furthermore, income constraints do not affect school lunch decisions in the same manner other purchase decisions do. School lunches are generally subsidized to some extent for all. Income and family size guidelines determine the amount of subsidy for which each household is eligible, however, with children from a great many households receiving free lunches.

Most studies have included school lunches in their analyses of meals eaten away from home. However, Redman (1980) excluded school lunches from her study of expenditures for food eaten away from home. She found that the presence of preschool and elementary aged children was negatively related to the expenditures for food purchased and eaten away from home. There was no significant relationship between those expenditures and the presence of high school aged children. Prochaska and Schrimper (1973), who included school lunches in their count of meals eaten away from home found that the quantity elasticity for noon meals purchased and eaten away from home was smaller than for all meals taken together. Their finding
seems to be an indication of the pervasive effect of school lunches on the count of meals eaten away.

Redman (1980) found that households who live in metropolitan areas spend more on meals away from home than rural families. She suggested that this might be a reflection of the availability and prices of eating establishments in the area of residence. Ortiz et al. (1981) found that rural families ate more meals away from home than urban families. This finding, again, may be affected by the greater participation of rural families in the school lunch program.

Household size has been found to be positively related to expenditures for food at home and away from home. Smallwood and Blaylock (1981) found that the expenditure elasticity for household size was .73 for at-home food and .11 for food purchased and eaten away from home. Thus, a household 10 percent larger than another would likely spend 7.33 percent more eating at home and only 1.1 percent more eating out. It also means that larger households would spend less per person.

Food Adequacy Compared to a Standard

There is evidence that people are able to articulate what the norms of a society are. In studies that ask questions about "the average American family" or the "average family" it has been found that responses are very similar throughout the population as a whole (Morris & Winter, 1978). Rainwater (1974) reported that for 18 Gallup polls between 1946 and 1969, the question was asked, "What is the smallest amount of money a family of four needs to get along in this community?" The amount given by
respondents between the years of 1954 and 1969, expressed in constant dollars, increased each year about equal amounts (1.4). The response, according to Rainwater, was indicative of the accuracy with which people can report a societal norm.

Income is of value to people because of what it can purchase. It may purchase security in the form of savings, but the major portion of household income is used in consumption. Thus, it follows that if people assess the adequacy of their consumption level by comparing their level with the norm, their satisfaction would depend on the degree to which their consumption compared with the norm.

Easterlin (1973) asserted that people assess their well-being relative to a social norm of what goods they ought to have. At a given time, those above the norm typically feel happier than those below. He analyzed data from 30 surveys in 19 developed and less developed countries and examined the relationship between reported happiness and income. He concluded that in all societies, more money for the individual typically meant more individual happiness. Raising the income of all within the society, however, does not increase the happiness of all. That conclusion, according to Easterlin, supports the hypothesis that satisfaction is a function of level of well-being relative to norms.

In a 1971 sample of Detroit area wives comparable to a sample of Detroit area wives surveyed in 1955 (Blood and Wolfe, 1960), Duncan (1975) found support for Easterlin's conclusions. When cross-sectional data were used, it was found that those with higher income levels expressed higher degrees of satisfaction, while those with lower income levels expressed
lower levels of satisfaction. When respondents were observed longitudinally, however, increased real income for the population as a whole did not lead to an increase in the respondents' reported level of living and reported satisfaction.

Volker (1979) and Volker, Winter, and Beutler (1983) conducted a study in which the family's satisfaction with the variety and quantity of food consumed was regressed on the family's comparison of its food with the food of "the average Iowa family", expenditures for food, household production of food (gardening and preservation), and sociodemographic background variables. The family's comparison of its food with the food of "the average Iowa family" was positively related; i.e., the more favorably they reported that their food compared to the food of other families, the more satisfied they were. Expenditures for food were significantly related; the more the family spent, the more satisfied they were with their food. Household production of food was not found to be significantly related to satisfaction. Household size was negatively related to satisfaction with food, indicating economic constraints. Of special interest was the finding that respondents were more satisfied not only when they spent more, but when they saw themselves as relatively well-off compared to some standard or norm.

Summary of Literature Review

The major elements of this chapter have dealt with some of the more significant studies of household production, food expenditures, and norms. These findings seem to indicate trends in the following directions:
Valuation of household production has been attempted by several methods.

Most household production, including preparation of food, is done by women.

The strongest predictor of housework time in meal preparation activities is employment status of the female head, but age of the youngest child also affects time spent.

Employed women do not substitute capital equipment nor labor of others for their time. The higher the value of their time, the more convenience foods are used. Employed wives do not seem to significantly substitute meals away from home for home-prepared meals.

There is some evidence that households that garden and preserve food have lower food expenditures.

Expenditures for food consumed at home and away from home are mainly affected by household income.

Households that assess the adequacy of their food as relatively good relative to their standard are more likely to be satisfied with the adequacy of their food.
CHAPTER IV: METHODS

The model chosen as a basis for this study has not been widely tested. It does, however, closely resemble the model tested and reported by Volker (1979) and Volker, Winter, and Beutler (1983), who used a much smaller and more localized sample, limited to households with both a male and a female head.

The Model to be Tested

Based on the conceptual model (Figure 1) and from findings from previous studies reported in the literature, the general model to be tested was developed. It is represented by Figure 2. From this model, certain general research hypotheses were developed, to be tested by operational methods that will be discussed later in this chapter.

The Hypotheses

- Household production activities such as gardening and preservation of food are a function of certain characteristics of the household and its members.
- The percentage of meals eaten away from home is a function of certain characteristics of the household and its members.
- Expenditures for food prepared and eaten at home and for food purchased and eaten away from home are a function of economic and time constraints.
- Expenditures for food are a function of household production activities such as gardening, and preservation of food.
- Expenditures for food are a function of the percent of household meals prepared and eaten at home.
- The household's assessment of the adequacy of quantities and types of food is a function of constraints.
Figure 2. Overall model to be tested

- Number of household heads
- Age of household head
- Education of household head
- Household size
- Income of the household heads
- Number of hours household heads employed
- Tenure
- Urbanization of residence

- Primary or secondary household production
- Expenditures for food
- Reported adequacy of food
The household's assessment of the adequacy of quantities and types of food is a function of household production activities such as gardening and preservation of food.

The household's assessment of the adequacy of quantities and types of food is a function of the percent of meals eaten at home.

The household's assessment of the adequacy of quantities and types of food is a function of the household's expenditures for food.

Two parallel models will be tested, which differ only in the indicator of household production.

The Source of Data

The data for the study were obtained from the 1977-78 United States Department of Agriculture Food Consumption Survey. In this survey, 14,930 households in the 48 conterminous States were interviewed. Detailed records were obtained of food consumed, sources of food expenditures, and other information about the households and their members. Interviews were conducted from April 1, 1977 to March 31, 1978, spanning all four seasons. The Food Consumption Survey was conducted in two phases; one phase, the individual phase, measured actual intakes of foods over a three day period for each household member, and was used for ascertaining food intake adequacy of individual household members. The individual phase was not used in this study.

The other phase, the household survey, ascertained money values of food prepared in the household and food eaten away. Thus, it included discarded food. Thus, measures of actual food expenditures and numbers of
meals consumed were available. A consecutive seven day period was used for the food consumption for each household in the household survey phase.

In the 1977-78 survey, for the first time, respondents were contacted prior to the interview, and asked to keep notes on foods consumed, labels, prices, etc. to aid them in recalling the foods used in the seven-day period of measurement.

The probability sample was obtained by stratifying U.S. households by nine regions and three urbanizations (SMSA's, central cities, other SMSA areas, and nonmetropolitan). From these, 114 probability samples were selected, each with approximately 600,000 households. Within these, 2500 sampling segments were selected with probability sampling, each containing approximately 100 households. Random sampling was done from those segments.

Through randomization, households within each segment were allocated to four quarterly samples. These households were interviewed at a uniform rate by day, week, and month throughout the three-month period. It was expected to have 3,750 households interviewed in each season. Actual completed interviews were 3,739 for spring, 3,728 for summer, 3,728 for fall, and 3,731 for winter, resulting in a total sample of 14,930. For this study, only households that had a female head present were selected; 13,748 households were in this category. Cases were dropped if income or expenditures for groceries were missing; 2,403 cases were in this category. The resulting sample consisted of 11,345 households.
The Variables

Two parallel models were tested, differing only in their indicator of household production, the independent variable. The first model, used as a measure of household production, a scale made up of specific activities such as gardening, canning and freezing, and others. This was called "primary household production". The second model used as the independent variable another indicator of household production, the percent of household meals prepared and eaten at home. All other variables in the models were identical. The operational definitions of all variables are described and basic statistics are presented in this section.

The exogenous variables

The exogenous variables used were: number of household heads, sex of the household head, age of the household head, education of the household head, household size, income of the household heads (both male and female), the number of hours the household heads were employed, tenure, and urbanization of residence.

The interview schedule allowed for the identification of two household heads if there were two identified as such by the respondent. Thus, a married or cohabiting couple's household would be considered to have both a male and a female head, or two. Others in the household were identified as to their relationship to the head of the household, who was considered to be the male, if present. Therefore for this study, the household head was considered to be male, if present, and if there was no male head, the head would be the female who was reported as the head of
the household. The number of household heads was recorded as the actual number, 1 or 2. Seventy-two percent had both a male and a female head. Twenty-eight percent had only one head (a female).

The age of the household head was recorded as the age at the date of the interview. The mean age was 47, and the standard deviation was 17.23. Ages ranged from 16 to 97.

The education of the household head was coded in categories of years of schooling. The mean was 11.75 years, with a standard deviation of 3.56.

Urbanization was coded in the following manner. If the household was rural farm, it was coded as 1. If it was rural nonfarm, it was coded as 2. If the household was located in a community of 2,500 persons or more or was in an urban fringe area around a city of 50,000 or more, it was considered to be urban, and was coded as 3. Urbanization is used as an ordinal variable in this analysis. As a part of the exploratory analysis, urbanization was tested in the regression as a set of dummy variables to examine whether it would be a superior method. However, the variable was found to act as an ordinal variable, so was retained in this fashion.

Household size was recorded as the number of people who "regularly live in the household, including those who are temporarily absent." The mean household size was 3 and the standard deviation was 1.64.

Income of the household heads was calculated from the total of all income received by the household heads during the previous year (1976-77) from all sources. Sources of income included: all wages; profit from business; estates, trusts, dividends and interest; pension income;
workmen's compensation; and AFDC and other cash assistance programs. It did not include the value of assistance in-kind, such as subsidized housing or the value of food stamps over their purchase price. The mean was $1,099 per month, and the standard deviation was $1,130.

The variable indicating the number of hours of employment of the household heads was coded as the number of hours the respondent reported that were worked last week by the male or female head if both were present. Otherwise, if there was only a female head, it was the number of hours she was employed. The mean was 38.12. The range from 0 to 200. The standard deviation was 31.76.

Tenure was coded as 1 if the household owned their dwelling and 0 if they did not. The number of owners was 7,658 (68 percent) and nonowners, 3,687 (32 percent).

The explanatory variables

There was one explanatory variable for each model. Each was a measure of household production. The first was a measure of production of foodstuffs prior to preparation, and was called "primary household production". The second was a measure of household production in the form of home meal preparation, and was operationalized as the percent of meals prepared and eaten at home. It was called "secondary household production".

"Primary household production" was measured by the number of activities engaged in by the household that produced goods and that would
later be used in meal preparation and family consumption. The activities were as follows:

- household grew potatoes
- household grew tomatoes
- household grew other vegetables
- household grew melons
- household grew other fruit
- household caught fish for own use
- household froze vegetables
- household froze fruit or berries
- household froze meat, poultry, fish, or game
- household made jellies, jams, or preserves
- household made pickles or relishes
- household canned vegetables
- household canned fruits
- household canned meats, poultry, fish, or game

These were dichotomous variables, with the respondent answering "yes" or "no". The items were coded 0 if the answer was "no" and 1 if the answer was "yes".

The individual items were summed to form a scale, after using Cronbach's alpha to see if the indicators fit well into a scale. The mean score was 3.45, with a standard deviation of 3.57. Cronbach's alpha, the coefficient of reliability was .875. No individual scale item, when deleted, raised the alpha coefficient higher than .877.

A second measure of household production was the percent of meals prepared and consumed at home by household members (secondary household production). The variable was obtained in the following manner. The data included one calculated variable that adjusted the number of meals eaten by individual household members away from home to account for the addition of snacks they ate away from home. Another calculated variable furnished the number of meals eaten by individual household members adjusted in the
same manner. The adjusted number of meals eaten at home and those eaten
away by each household member were summed across all members of the
household. The percent of meals eaten at home was then obtained by
dividing the household's total adjusted meals at home by the total
adjusted meals consumed by the household at home and away. The percent of
household meals eaten at home ranged from 0 to 100. The mean was 88.3
and the standard deviation was 14.71. Thirty-five percent of the
households ate no food away from home during the survey week.

The intervening variable

The measure of food expenditures was obtained from summing the
households' reported usual weekly expenditures for food purchased at
grocery and specialty stores, and the actual expenditure for food consumed
by household members away from home during the survey week. The mean was
$53.27 and the standard deviation was $33.29.

The dependent variable

The household's adequacy of its food was assessed by the respondent's
answer to: "Which of the following statements best describes the food
eaten in your household?" The possible answers and their coding are: (1)
often not enough to eat (2) sometimes not enough to eat (3) enough but not
always what we want to eat and (4) enough and the kinds of food we want to
eat. Thus, the higher the code, the more adequate in quantity and quality
the household saw their food to be. This may be thought of as an ordinal
scale ranging from very inadequate to fully adequate. The mean was 3.70,
and the standard deviation was .55.
The Statistical Analysis

The data were analyzed by using the SPSSx statistical package (SPSS Inc., 1983). Frequency distributions were examined for all variables and missing data and extreme cases were recoded to minimize their effects in the regression analysis.

Cross-tabulations were used in preliminary analysis, especially to detect any curvilinear relationships that would not have been apparent in the regression analysis, but would not provide a good fit using ordinary least squares analysis. Although income and expenditure variables sometimes exhibit curvilinear relationships in some parts of their distribution, none were apparent, nor did a curvilinear relationship seem to exist between age and income.

Pearson product moment correlations were done on all variables (Table 1). Special care was taken to examine intercorrelations between background variables that might cause a spurious relationship between other variables. The greater the intercorrelation of the background variables, the smaller is the reliability of the strength of the relationship as indicated by the regression coefficients. The situation in which high correlations between exogenous or independent variables occurs is called multicollinearity. Nie, Hull, Jenkins, Steinbrenner, and Bent (1975) suggest that multicollinearity exists when correlations are over .80. None of the correlations between the exogenous variables in this analysis were greater than .46. Therefore, multicollinearity was not considered to be a potential problem.
Table 1. Pearson product-moment correlations of all variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Age of Head</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>2. Education</td>
<td>-.36</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Number of Heads</td>
<td>-.17</td>
<td>.13</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Household Size</td>
<td>-.33</td>
<td>.04</td>
<td>-.06</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>5. Number of Hours Worked by Heads</td>
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<td>.32</td>
<td>.45</td>
<td>.29</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Income of Heads</td>
<td>-.16</td>
<td>.34</td>
<td>.33</td>
<td>.18</td>
<td>.42</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>7. Tenure</td>
<td>.25</td>
<td>.05</td>
<td>.28</td>
<td>.12</td>
<td>.11</td>
<td>.18</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>8. Urbanization</td>
<td>-.08</td>
<td>.11</td>
<td>-.14</td>
<td>-.06</td>
<td>-.04</td>
<td>.01</td>
<td>.19</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>9. Primary Household Production</td>
<td>.12</td>
<td>.01*</td>
<td>.26</td>
<td>.13</td>
<td>.10</td>
<td>.10</td>
<td>.35</td>
<td>-.40</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Secondary Household Production</td>
<td>.24</td>
<td>-.25</td>
<td>-.05</td>
<td>.01*</td>
<td>-.32</td>
<td>-.21</td>
<td>.02*</td>
<td>-.07</td>
<td>.06</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Food Expenditures</td>
<td>-.22</td>
<td>.17</td>
<td>.35</td>
<td>.55</td>
<td>.33</td>
<td>.33</td>
<td>.13</td>
<td>.08</td>
<td>-.01*</td>
<td>-.24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Reported Adequacy</td>
<td>.04</td>
<td>.26</td>
<td>.18</td>
<td>-.08</td>
<td>.20</td>
<td>.22</td>
<td>.21</td>
<td>-.06</td>
<td>.15</td>
<td>-.14</td>
<td>.09</td>
<td></td>
</tr>
</tbody>
</table>

*Not significant at the .001 level.
The zero order correlation between the two measures of household production was low (.06). Therefore, the two measures could not be combined to form a single variable, "household production". Instead, two parallel path models were tested, using identical exogenous, intervening, and dependent variables, and differing only in the explanatory variable, which was primary household production in Model I, and secondary household production in Model II.

The two models were tested by standard path analysis. Path analysis has the advantage of using multiple regression techniques which control for all variables in the equation simultaneously while the strength of relationship of interest is being tested. It also has the advantage of testing the strength of relationships in a causal modeling. Path analysis uses standardized regression coefficients. The coefficient can be interpreted as the expected change in the standard deviation of the dependent variable associated with one standard deviation change in an independent variable, while all other remaining variables remain constant (Pedhazur, 1982). Standardized regression coefficients are scale-free, so can be compared across variables that initially have differing scales of measurement. The relative magnitudes of the standardized regression coefficients are an indication of the relative predictive strength of the explanatory variables with which they are associated.

It is possible to ascertain whether variables are intervening in a path model by examining the direct and indirect effects of one variable on another. Indirect effects are transmitted by variables that are specified as consequences of antecedent variables and the determinants of dependent
variables (Alwin and Hauser, 1981). Direct effects are the remaining effects of the antecedent variables after the intervening variables are entered into the model and the antecedent variables are held constant (Alwin & Hauser, 1981). Direct and indirect effects were examined in this analysis to ascertain whether the model's predictive variables exerted influences through intervening variables. Specifically, it was of interest to ascertain whether household production exerted an influence on adequacy of food through household food expenditures, and whether the exogenous variables exerted their influence on food expenditures and adequacy through household production.
CHAPTER V: THE FINDINGS

Results of the analysis are presented in this chapter. The findings from testing the model using the scale of primary household production (Model I) will be presented first, followed by findings from the testing of the model using the percent of meals eaten at home as the household production variable (Model II).

Because the sample size was very large, there was a tendency for almost all relationships to be significant, even when using a stringent probability level of .001. Therefore, the discussion of predictors will be limited to those with a standardized regression coefficient of .10 or larger. The direct paths in Model I are shown in Table 2. The direct paths from testing Model II are shown in Table 3.

Model I: Primary Household Production

Predictors of primary household production

Predictors of primary household production that had standardized regression coefficients equal to or greater than .10 were: urbanization, tenure, number of household heads, and age of the household head (Table 2).

Those who lived in rural areas did significantly more primary household production activities than those who lived in metropolitan areas. Some of the components of the primary household production scale were gardening activities. It is clear that it is necessary to have suitable land area available to do gardening, and people in rural
Table 2. Standardized regression coefficients for the variables in Model I

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Dependent Variables</th>
<th>Reported Adequacy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Primary Household Production</td>
<td>Food Expenditures</td>
</tr>
<tr>
<td>Age of Head</td>
<td>.104*</td>
<td>.066*</td>
</tr>
<tr>
<td>Education of Head</td>
<td>.046*</td>
<td>.068*</td>
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<td>Household Size</td>
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<td>.484*</td>
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<tr>
<td>Number of Heads</td>
<td>.143*</td>
<td>.097*</td>
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<td>Hours Worked by Heads</td>
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<td>.098*</td>
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<tr>
<td>Income of Heads</td>
<td>.005</td>
<td>.160*</td>
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<tr>
<td>Tenure</td>
<td>.211*</td>
<td>.045*</td>
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<tr>
<td>Urbanization</td>
<td>-.334*</td>
<td>.091*</td>
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<tr>
<td>Primary Household Production</td>
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<td>-.107*</td>
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<tr>
<td>Total Food Expenditures</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>$R^2$</td>
<td>.266*</td>
<td>.396*</td>
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<tr>
<td>F Ratio</td>
<td>514.103</td>
<td>825.835</td>
</tr>
<tr>
<td>df</td>
<td>8 &amp; 11,336</td>
<td>9 &amp; 11,335</td>
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<tr>
<td>Path Residual</td>
<td>.857</td>
<td>.790</td>
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</table>

*Significant at .001 level.
Table 3. Standardized regression coefficients for the variables in Model II

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Secondary Household Production</th>
<th>Food Expenditures</th>
<th>Reported Adequacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age of Head</td>
<td>.109*</td>
<td>.076*</td>
<td>.129*</td>
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<tr>
<td>Education of Head</td>
<td>-.103*</td>
<td>.044*</td>
<td>.223*</td>
</tr>
<tr>
<td>Household Size</td>
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<td>.499*</td>
<td>-.190*</td>
</tr>
<tr>
<td>Number of Heads</td>
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<td>.099*</td>
<td>.115*</td>
</tr>
<tr>
<td>Hours Worked by Heads</td>
<td>-.270*</td>
<td>.044*</td>
<td>.115*</td>
</tr>
<tr>
<td>Income of Heads</td>
<td>-.096*</td>
<td>.141*</td>
<td>.058*</td>
</tr>
<tr>
<td>Tenure</td>
<td>-.005</td>
<td>.022</td>
<td>.122*</td>
</tr>
<tr>
<td>Urbanization</td>
<td>-.045*</td>
<td>.117*</td>
<td>-.047*</td>
</tr>
<tr>
<td>Secondary Household Production</td>
<td></td>
<td>-.194*</td>
<td>-.047*</td>
</tr>
<tr>
<td>Total Food Expenditures</td>
<td></td>
<td></td>
<td>.063*</td>
</tr>
<tr>
<td>$R^2$</td>
<td>.158</td>
<td>.419</td>
<td>.176</td>
</tr>
<tr>
<td>F ratio</td>
<td>266.538</td>
<td>909.900</td>
<td>242.260</td>
</tr>
<tr>
<td>df</td>
<td>8 &amp; 11,336</td>
<td>9 &amp; 11,335</td>
<td>10 &amp; 11,334</td>
</tr>
<tr>
<td>Path Residual</td>
<td>.917</td>
<td>.762</td>
<td>.908</td>
</tr>
</tbody>
</table>

*Significant at the .001 level.
areas would be more likely to have garden space. The standardized regression coefficient for urbanization was -.33, which was the strongest predictor of primary household production.

Tenure (home ownership) was significantly related to primary household production with a standardized regression coefficient of .21, indicating that home owners were more likely to do more primary household production activities than nonowners. Part of this effect may have been due to the relationship between apartment-dwelling and renting. Those who lived in apartments or other multifamily living arrangements were likely to be renters; and they may not have space and facilities for gardening.

The number of household heads was positively related to primary household production with a standardized regression coefficient of .14. This finding was not surprising, since when there are two adults in the household there are more people to do all household activities, freeing time to do primary household production activities.

Households with older heads were more likely to do more primary household production activities. The standardized regression coefficient for the age of the household head was .10. Perhaps the older household heads learned to do canning, freezing, and gardening when they were younger, and continued the activities.

The education of the head, household size, and the number of hours worked by heads of the household were significant predictors, but fell below the criterion level of .10 for the standardized regression coefficient. Household income was not a significant predictor of primary household production.
It was somewhat surprising that household size was not a better predictor of primary household production, for larger households would have more people to do the work, depending upon the age of the children. In addition, when income was controlled, households of larger sizes would have had a more severe income constraint, which might have led them to do more primary household production activities.

It was also somewhat surprising that the number of hours worked by the heads of the household did not have much effect on the number of primary household production activities. It would have seemed that the households in which the heads worked more hours would have had less adult time available for primary household production activities.

The lack of a relationship between income of the household heads and primary household production activities indicated that there may have been other motivations for these activities than the motivation of overcoming an income constraint.

The $R^2$ for the regression of primary household production on the exogenous variables was .27. This indicated that 27% of the variance in primary household production was explained by the exogenous variables. The $R^2$ was significant, with an F ratio of 514.

**Expenditures for food**

Predictors of food expenditures that were significant and met the criterion level of .10 for the standardized regression coefficient were: primary household production, household size, income of the household heads, hours worked by the household heads, and number of household heads.
The households that did primary household production activities had lower total food expenditures. The standardized regression coefficient was \(-0.11\), an indication that primary household production activities did have the effect of lowering food expenditures. The relationship may have been partially due to a preference for home-produced food, which would lead those households to eat fewer meals away, and thus, lower total food expenditures. But those activities surely decreased the amount of food purchased for use at home, and thus lowered expenditures for food prepared at home.

The strongest predictor of total food expenditures was, as expected, household size. The standardized regression coefficient was \(0.48\). Larger households simply consume more food, thus increasing expenditures for food.

The income of the household heads was positively related to expenditures for food, with a standardized regression coefficient of \(0.16\). This relationship indicated that income served as a constraint, because those households that had higher incomes did spend more. Food expenditures often exhibit a curvilinear relationship to income (the Engel curve). As income rises, food expenditures increase at a decreasing rate, leveling off at higher levels of income. In this study, the relationship was tested for curvilinearity by using the natural logarithm of the income of the heads in place of the income of the heads. The explained variance \((R^2)\) was not improved. The curvilinear pattern may not have been present because the food expenditure variable included both food expenditures away from home and expenditures for food used at home.
The number of hours worked by the household heads was positively related to food expenditures with a standardized regression coefficient of .10. The relationship was not due to the effect of increased income, for income was controlled in the regression equation. The relationship may have been partially due to eating more meals away from home. A preliminary correlation indicated that there was a positive correlation between hours worked and expenditures for food eaten away from home (Table 2).

The number of household heads was positively related to expenditures for food, with a standardized regression coefficient of .10. The households that had both a male and a female head spent more for food, which perhaps was an effect of having one more adult in the household when household size was controlled.

Urbanization, age of the head of the household, education of the household head, and tenure were all significantly positively related to expenditures for food. However, they did not meet the criterion of a standardized regression coefficient of at least .10.

The $R^2$ for the regression of food expenditures on primary household production and the exogenous variables was .40. Thus, a sizeable amount of variance (40 percent) in the food expenditure variable was explained by the other variables in the equation. It was significant at the .001 level with an F ratio of 825.
Reported adequacy of the household's food

Significant predictors of reported adequacy of food that also met the criterion of a standardized regression coefficient of at least .10 were: education of the household head, household size, hours worked by the household heads, age of the head, tenure, and number of heads of the household.

The strongest predictor of reported adequacy was the education of the head of the household, with a positive regression coefficient of .22. Households in which the head had more education reported higher levels of adequacy of their food. Perhaps they were better able to assess the adequacy.

Household size was negatively related to the household's reported adequacy of its food, with a standardized regression coefficient of -.21. Thus, household size may have served as a constraint to obtaining what the household considered to be adequate food. It was not a surprising finding. In a multiple regression equation, all variables are controlled except for the predictor of interest. Thus, for equal incomes, the larger households would have more people to feed.

The age of the head of the household was a positive predictor of the reported adequacy of food. The standardized regression coefficient was .12. Households that had older heads reported a higher level of adequacy of their food. This finding may have occurred because the referent for the comparison was to times of the past, when the quantity or type of food was considered to be less adequate.
Weekly hours worked by the household heads, tenure, and number of household heads had positive standardized regression coefficients of .13, .11, and .10, respectively. They were all significant positive predictors of the household's reported adequacy of its food.

Income of the household heads was not strongly related to the household's report of the adequacy of their food. The variable was significant at the .001 level, but its standardized regression coefficient was small, and did not meet the criterion of .10.

Food expenditures at home and away were not strongly related to the household's reported adequacy of food. The standardized regression coefficient did not meet the .10 criterion level. It had been hypothesized that expenditures would be related positively to the household's reported adequacy of food. This hypothesis was based on the results of a previous study in which the relationship was positive between expenditures for food and the household's comparison of its food with that of "the average Iowa family" (Volker, 1979; Volker, Winter & Beutler, 1983). It is not unusual, however, that no relationship was found in this study. Economic theory holds that the relationship between utility (satisfaction) and expenditures depends upon the price elasticity of the individual commodities. Expenditures can increase or decrease for particular commodities, depending on the commodity's price elasticity of demand. Therefore, the relationship between expenditures and satisfaction may be ambiguous.

The $R^2$ for the prediction of food adequacy for Model I with all variables in the equation was .18, meaning that 18 percent of the variance
in the adequacy variable was explained by the prior variables in the equation.

**Indirect effects**

Total, direct, and indirect effects of the explanatory and intervening variables in Model I are shown in Table 4. Coefficients for all indirect paths passing through primary household production and food expenditures were small. Therefore, it was concluded that the predictors of food expenditures and adequacy were those forming the direct paths, only; and that the predictors did not exert influence via intervening variables.

**Model II: Secondary Household Production**

The second measure of household production is the percent of household meals eaten at home, and is called "secondary household production". Meal preparation is a production activity. When households choose to purchase meals, they have chosen not to produce them. By using the percentage of meals prepared and eaten at home, rather than the absolute number of meals eaten at home, the variable was adjusted for the differences in the number of meals eaten by households of equal sizes. The results of the analysis are shown in Table 3.

**Predictors of secondary household production**

Significant predictors of secondary household production that met the criterion of a standardized regression coefficient of at least .10 were:
Table 4. Direct, indirect, and total effects in Model I

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Independent Variable</th>
<th>Total Effect</th>
<th>Indirect Effect Via Primary Household Production</th>
<th>Direct Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Household Production</td>
<td>Age of Head</td>
<td>.104</td>
<td>-</td>
<td>.104</td>
</tr>
<tr>
<td></td>
<td>Education of Head</td>
<td>.047</td>
<td>-</td>
<td>.047</td>
</tr>
<tr>
<td></td>
<td>Household Size</td>
<td>.056</td>
<td>-</td>
<td>.056</td>
</tr>
<tr>
<td></td>
<td>Number of Heads</td>
<td>.143</td>
<td>-</td>
<td>.143</td>
</tr>
<tr>
<td></td>
<td>Hours Worked by Heads</td>
<td>.010</td>
<td>-</td>
<td>.010</td>
</tr>
<tr>
<td></td>
<td>Income of Heads</td>
<td>.005</td>
<td>-</td>
<td>.005</td>
</tr>
<tr>
<td></td>
<td>Tenure</td>
<td>.211</td>
<td>-</td>
<td>.211</td>
</tr>
<tr>
<td></td>
<td>Urbanization</td>
<td>-.334</td>
<td>-</td>
<td>-.334</td>
</tr>
<tr>
<td>Food Expenditures</td>
<td>Age of Head</td>
<td>.055</td>
<td>-.011</td>
<td>.066</td>
</tr>
<tr>
<td></td>
<td>Education of Head</td>
<td>.063</td>
<td>-.005</td>
<td>.068</td>
</tr>
<tr>
<td></td>
<td>Household Size</td>
<td>.478</td>
<td>-.006</td>
<td>.484</td>
</tr>
<tr>
<td></td>
<td>Number of Heads</td>
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<td>-.015</td>
<td>.097</td>
</tr>
<tr>
<td></td>
<td>Hours Worked by Heads</td>
<td>.097</td>
<td>-.001</td>
<td>.098</td>
</tr>
<tr>
<td></td>
<td>Income of Heads</td>
<td>.160</td>
<td>-.006</td>
<td>.160</td>
</tr>
<tr>
<td></td>
<td>Tenure</td>
<td>.023</td>
<td>-.023</td>
<td>.045</td>
</tr>
<tr>
<td></td>
<td>Urbanization</td>
<td>.126</td>
<td>.036</td>
<td>.091</td>
</tr>
<tr>
<td></td>
<td>Primary Household</td>
<td>-.107</td>
<td>-</td>
<td>-.107</td>
</tr>
<tr>
<td></td>
<td>Production</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reported Adequacy of Food</td>
<td>Age of Head</td>
<td>.127</td>
<td>.006</td>
<td>.116</td>
</tr>
<tr>
<td></td>
<td>Education of Head</td>
<td>.232</td>
<td>.008</td>
<td>.223</td>
</tr>
<tr>
<td></td>
<td>Household Size</td>
<td>-.165</td>
<td>.003</td>
<td>-.209</td>
</tr>
<tr>
<td></td>
<td>Number of Heads</td>
<td>.116</td>
<td>.008</td>
<td>.099</td>
</tr>
<tr>
<td></td>
<td>Hours Worked by Heads</td>
<td>.133</td>
<td>.001</td>
<td>.125</td>
</tr>
<tr>
<td></td>
<td>Income of Heads</td>
<td>.073</td>
<td>.000</td>
<td>.060</td>
</tr>
<tr>
<td></td>
<td>Tenure</td>
<td>.123</td>
<td>.012</td>
<td>.107</td>
</tr>
<tr>
<td></td>
<td>Urbanization</td>
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<td>-.019</td>
<td>-.025</td>
</tr>
<tr>
<td></td>
<td>Primary Household</td>
<td>.058</td>
<td>-</td>
<td>.067</td>
</tr>
<tr>
<td></td>
<td>Production</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Food Expenditures</td>
<td>.084</td>
<td>-</td>
<td>.084</td>
</tr>
</tbody>
</table>
weekly hours worked by the heads, age of the head, household size, education of the head, and income of the household heads.

The strongest predictor of secondary household production was weekly hours worked by the household heads. The standardized regression coefficient was \(-.27\), indicating that the households in which the head or heads were employed more hours ate a smaller percent of their meals at home than other households. When two household heads work many hours between them, or a single head is employed many hours, there is a time constraint, and perhaps an energy constraint. It then may be more convenient in terms of time and energy costs to purchase meals away.

The age of the household head was positively related to the percent of meals eaten at home, with a standardized regression coefficient of \(.11\). Thus, households with older heads tended to prepare and eat a larger percentage of their meals at home. This finding was not due to the effect of nonemployment, because hours worked by household heads was controlled.

Household size was positively related to the percent of meals eaten at home. The standardized regression coefficient was \(.11\). Larger households ate a greater percentage of their meals at home. Although larger households sometimes have more members eating school lunches, larger households may have found it more efficient to prepare meals at home rather than getting the whole family ready and organized to go out to eat as a family.

The education of the head and the income of the household heads were negatively related to the percent of meals eaten at home, both having standardized regression coefficients of \(-.10\). Those with higher incomes
and higher education levels seemed to eat a smaller percentage of their meals at home than others. Higher incomes remove financial constraints, making people more able to spend additional money to eat away from home.

In many ways it was surprising that the coefficient was not larger. The unstandardized regression coefficient was -.001, indicating that for every additional dollar of income monthly, the percent of meals eaten at home was lowered by one tenth of one percent. The negative effect of education on the percent of meals eaten at home may have been an effect of socioeconomic status, in that people who were highly educated may have desired more variety and enjoyed the experience of eating out.

The number of household heads was positively related to the percent of meals eaten at home, and urbanization was negatively related. Both were significant at the .001 level but did not meet the criterion of a standardized regression coefficient of at least .10. Tenure was not significantly related to the percent of meals away from home.

The $R^2$ for the regression of secondary household production on the exogenous variables was .16, indicating that 16 percent of the variance in secondary household production was explained by the exogenous variables. The F ratio was 267.

**Expenditures for food**

Significant predictors of total food expenditures that also met the criterion of a standardized regression coefficient of .10 were: household size, secondary household production, income of the household heads, urbanization, and number of household heads.
The strongest predictor of total food expenditures was household size, with a standardized regression coefficient of .50. This finding was not surprising; household size was also the strongest predictor of food expenditures in Model I.

Secondary household production (the percent of meals eaten at home) was significantly negatively related to food expenditures, with a standardized regression coefficient of -.19. Because by definition, a higher percent of total meals eaten at home means that less meals are eaten away, this relationship was no doubt due largely to the fact that food eaten away from home is more costly.

Income of the household heads was positively related to total food expenditures with a standardized regression coefficient of .14. This finding was not surprising, and indicated that income served as a constraint. A curvilinear relationship was not found.

Urbanization was positively related to total food expenditures. The standardized regression coefficient was .12, indicating that households that lived in more urban areas spent more for food. The number of household heads was also positively related to food expenditures, with a standardized regression coefficient of .10.

Age of the head, education of the head, and hours worked by the household head were positively related to food expenditures, but did not meet the criterion of having a standardized regression coefficient of at least .10. Tenure was not a significant predictor.
The $R^2$ for the regression of food expenditures on secondary household production and the exogenous variables was .42, which was significant at the .001 level. The $F$ ratio was 910.

**Reported adequacy of the household's food**

Significant predictors of reported adequacy of food that met the criterion of a standardized regression coefficient of .10 were: education of the head of the household, household size, age of the household head, tenure, hours worked by the household heads, and number of household heads. These were exactly the same predictors as in Model I.

The standardized regression coefficients were as follows: education of the head, .22; household size, -.19; age of the household head, .13; tenure, .12; hours worked by the household heads, .12; and number of household heads, .12.

Income of the household heads did not meet the criterion of a standardized regression coefficient of at least .10, nor did either the independent variable of secondary household production and the proposed intervening variable of food expenditures.

The $R^2$ for the regression equation with reported adequacy of food as the dependent variable was .18, indicating that 18 percent of the variance in reported adequacy was explained by the other variables in the equation. The $R^2$ was significant at the .001 level with an $F$ ratio of 242.

**Indirect effects**

Total direct, and indirect effects of the explanatory and intervening variables in Model II are shown in Table 5. Coefficients for all indirect
Table 5. Direct, indirect, and total effects in Model II

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Independent Variable</th>
<th>Total Effect</th>
<th>Indirect Effect Via Secondary Food Household Production</th>
<th>Direct Effect</th>
</tr>
</thead>
<tbody>
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<td>.109</td>
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<tr>
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<td>Education of Head</td>
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<td>-</td>
<td>-.103</td>
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<td>-</td>
<td>.105</td>
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<td>Number of Heads</td>
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<td>-</td>
<td>.089</td>
</tr>
<tr>
<td></td>
<td>Hours Worked by Heads</td>
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<td>-</td>
<td>-.270</td>
</tr>
<tr>
<td></td>
<td>Income of Heads</td>
<td>-.096</td>
<td>-</td>
<td>-.096</td>
</tr>
<tr>
<td></td>
<td>Tenure</td>
<td>-.005</td>
<td>-</td>
<td>-.005</td>
</tr>
<tr>
<td></td>
<td>Urbanization</td>
<td>-.045</td>
<td>-</td>
<td>-.045</td>
</tr>
<tr>
<td>Food Expenditures</td>
<td>Age of Head</td>
<td>.055</td>
<td>-.021</td>
<td>.076</td>
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<tr>
<td></td>
<td>Education of Head</td>
<td>.063</td>
<td>.020</td>
<td>.044</td>
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<td>Household Size</td>
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<td>Number of Heads</td>
<td>.082</td>
<td>-.017</td>
<td>.099</td>
</tr>
<tr>
<td></td>
<td>Hours Worked by Heads</td>
<td>.097</td>
<td>.052</td>
<td>.044</td>
</tr>
<tr>
<td></td>
<td>Income of Heads</td>
<td>.160</td>
<td>.019</td>
<td>.141</td>
</tr>
<tr>
<td></td>
<td>Tenure</td>
<td>.023</td>
<td>.001</td>
<td>.022</td>
</tr>
<tr>
<td></td>
<td>Urbanization</td>
<td>.126</td>
<td>.009</td>
<td>.117</td>
</tr>
<tr>
<td></td>
<td>Secondary Household Production</td>
<td>- .194</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Reported Adequacy of Food</td>
<td>Age of Head</td>
<td>.127</td>
<td>-.006</td>
<td>.129</td>
</tr>
<tr>
<td></td>
<td>Education of Head</td>
<td>.232</td>
<td>.006</td>
<td>.223</td>
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<tr>
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<td>-.165</td>
<td>-.006</td>
<td>-.190</td>
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<td>Number of Heads</td>
<td>.116</td>
<td>-.005</td>
<td>.115</td>
</tr>
<tr>
<td></td>
<td>Hours Worked by Heads</td>
<td>.133</td>
<td>.016</td>
<td>.115</td>
</tr>
<tr>
<td></td>
<td>Income of Heads</td>
<td>.073</td>
<td>.006</td>
<td>.058</td>
</tr>
<tr>
<td></td>
<td>Tenure</td>
<td>.123</td>
<td>.000</td>
<td>.122</td>
</tr>
<tr>
<td></td>
<td>Urbanization</td>
<td>-.037</td>
<td>.003</td>
<td>-.047</td>
</tr>
<tr>
<td></td>
<td>Secondary Household Production</td>
<td>.059</td>
<td>-</td>
<td>-.012</td>
</tr>
<tr>
<td></td>
<td>Food Expenditures</td>
<td>.063</td>
<td>-</td>
<td>.063</td>
</tr>
</tbody>
</table>
paths passing through secondary household production and food expenditures were small. Therefore, it was concluded that the predictors of food expenditures and adequacy are those forming the direct paths, only; and that the predictors did not exert influence via intervening variables.

Comparison of Models

The two types of household production were, in general, predicted by different exogenous variables. The strongest predictor of primary household production was urbanization, followed by tenure, number of heads, and age of the head. The strongest predictor of secondary household production was the number of heads, followed by household size, education of the head, and age of the head. Clearly, the two measures of household production seemed to be functions of different predictors; primary household production was a function of where the household lived (tenure and urbanization), the number of people to do the work, and the age of the head. Secondary household production seemed to be a function of the employment lives of the heads, the household size, and the sociodemographic variables of education and age.

Food expenditures in the two models were not predicted by identical exogenous variables, either; although household size was by far the most important predictor of food expenditures in both models, which was not unexpected.

In Model I, food expenditures were also predicted by the income of the household heads, primary household production, hours worked by the heads, and the number of heads. The influence of the income of the heads
indicated the effects of income constraints. The influence of hours worked and the number of household heads on food expenditures was probably an effect of additional meals eaten away from home or the purchase of more costly convenience foods to be consumed at home. The negative relationship between primary household production and food expenditures indicated that people did save on their food expenditures by doing primary household production.

In Model II, food expenditures were predicted by only five of the exogenous variables: household size, percent of meals at home, number of household heads, income of the household heads, and urbanization. It was interesting that the number of hours worked and the number of heads did not change the expenditures for food to any great extent in Model II. As in Model I, the relationship of income seemed to be linear, not curvilinear. Secondary household production, like primary household production, had a significant negative effect on food expenditures. However, it was a stronger effect than that contributed by primary household production, the standardized regression coefficient being -.19, compared to -.11 for the effect of primary household production.

The reported adequacy of the household's food was predicted in both models only by exogenous variables. The important predictors of reported adequacy in both models were: education of the head, household size, hours worked by the heads, age of the head, and tenure. Thus, neither measure of household production affected the households' report of the adequacy of their food either directly or indirectly through a change in food expenditures.
CHAPTER VI: DISCUSSION AND CONCLUSIONS

Purpose

The purpose of this study was to examine relationships between activities in the production of household food and (1) expenditures for food at home and away and (2) the household's assessment of the adequacy of the food consumed. Two different measures of food were used: activities prior to the final preparation of food, such as gardening, canning and freezing (primary household food production) and the proportion of the household's meals during a specific week that were eaten at home (secondary household food production).

Procedure

Data for the analysis were obtained from the 1977-78 United States Department of Agriculture Food Consumption Survey. The probability sample was obtained by stratifying U.S. households by nine regions and three urbanizations, SMSA's, central cities, other SMSA areas, and nonmetropolitan. Sampling segments were selected with probability sampling, and random sampling was done from these.

Through randomization, households within each segment were allocated to four quarterly samples. The households were interviewed at a uniform rate through the three-month period. The total sample consisted of 14,930 households. For this study, only households that had a female head present were selected. Cases were dropped if income or expenditures for groceries were missing. The resulting sample consisted of 11,345 households.
Socioeconomic and demographic variables were used as antecedent or exogenous variables. Household production was used as an independent variable. The intervening variable was food expenditures at home and away, and the dependent variable was the household's reported adequacy of its food.

From the theoretical model it was hypothesized that the dependent variable, reported adequacy of the household's food, would be predicted by household production, the intervening variable of expenditures for food, and the exogenous antecedent variables.

Two parallel models were tested, which differed only in the independent variable, household production. Model I used primary household production as the independent variable. This scale variable was constructed from 14 activities such as gardening, fishing, freezing, and canning. Model II used secondary household production, operationalized as the percent of household meals prepared and eaten at home.

Major Findings

The hypothesis that primary household production activities such as gardening, fishing, and food preservation are a function of certain characteristics of the household and its members was not rejected. The $R^2$ of .27 indicated that 27 percent of the variance in primary household production was explained by the exogenous socioeconomic and demographic variables.

The second hypothesis was that the percentage of meals eaten at home was a function of certain characteristics of the household and its
members. The hypothesis was not rejected. The $R^2$ of .16 indicated that 16 percent of the variance in secondary household production was explained by the exogenous socioeconomic and demographic variables.

The third hypothesis was that expenditures for food prepared and eaten at home and for food purchased and eaten away from home are a function of economic and time constraints. The hypothesis was not rejected. The regression coefficients, when the food expenditures variable was representing income constraints in the form of household income and household size, were significant in both models. They were .16 and .48, respectively for Model I and .14 and .50 in Model II. In the same equations, the regression coefficients representing time constraints in the form of number of household heads and hours worked by the household heads were significant. Both were .10 in Model I. In Model II, the significant regression coefficient predicting food expenditures was .10 for the number of heads, but only .04 for the hours worked by the heads.

The fourth hypothesis was that expenditures for food are a function of household production activities such as gardening, fishing, and preservation of food (primary household production). The hypothesis was not rejected. The standardized regression coefficient for food expenditures using primary household production as a predictor in the equation and controlling for the exogenous variables was significant at -.11. Thus, households that did primary household production activities did spend less money for food at home and away.
The fifth hypothesis was that expenditures for food are a function of the percent of household meals prepared and eaten at home. The hypothesis was not rejected. The standardized regression coefficient was -.19.

The sixth hypothesis was that the household's assessment of the adequacy of quantities and types of food is a function of constraints. The hypothesis was not rejected. The $R^2$ for the regression of reported adequacy on the exogenous variables (considered to be constraints) was .17 and significant at the .001 level. And the equations with 11 variables in the equation for the path models had an $R^2$ of .18 for both Model I and Model II.

The seventh hypothesis was that the household's assessment of the adequacy of quantities and types of food is a function of household production activities such as gardening, fishing, and preservation of food. The hypothesis was not rejected on the basis of the significance level of .001. However, the relationship was not strong, and did not reach the criterion level of a standardized regression coefficient of at least .10.

The eighth hypothesis was that the household's assessment of the adequacy of quantities and types of food is a function of the percent of meals prepared and eaten at home. The hypothesis was not rejected on the basis of the significance level of .001, but the relationship was weak. The standardized regression coefficient did not meet the criterion level of .10.

The ninth hypothesis was that the household's assessment of the adequacy of quantities and types of food consumed is a function of the
expenditures for food. The hypothesis was not rejected on the basis of significance level in either Model I or Model II. However, the standardized regression coefficients did not meet the criterion level of .10.

Conclusions

One important conclusion from this study is that there is not a relationship between the predictors of and the effects of the two types of household food production activities. These two types of household production activities are primary household production of food, consisting of gardening, fishing, and food preservation activities, and secondary household production, represented by the percentage of household meals prepared and consumed at home.

The Pearson Product Moment correlation indicated little zero order correlation between the two measures of household production, and this was corroborated by the way that the two measures performed in analysis of the two parallel models. When they were tested in parallel models with identical exogenous variables, with food expenditures as an intervening variable and the household's reported adequacy of their food as the dependent variable, the models did not yield the same results.

Primary household production is primarily a product of where the households live; that is, the degree of urbanization of their residence area, and whether they own their own home (which probably is a function of apartment-dwelling versus living in a single-family dwelling). Secondary household production is primarily a function of the characteristics of
household members; that is, the age and education of the household head, the number of heads, and the size of the household.

Both forms of household production have a significant negative effect on expenditures for food. The $R^2$ for the equation using primary household production and the exogenous variables as predictors of food expenditure was .40; and the $R^2$ for the equation using secondary household production and the exogenous variables was .41. It seems that both forms of household production serve to lower food expenditures; but there is no reason to expect the two forms to occur together.

Neither form of household production is a strong predictor of the household's reported adequacy of the food it consumes, either directly, or indirectly through food expenditures.

Suggestions for Further Study

The models had as their dependent variable the respondent's reported assessment of the adequacy of their food. No assessment of the household's satisfaction with its food was available, but this would have added another dimension. In that case, the assessment of adequacy would be an intervening variable prior to the dependent variable of the household's degree of satisfaction.

It would also be of interest to assess the household's motivations for doing primary household production, whether it was a matter of habit, a desire to save money, their enjoyment of the process, or because they obtained a better product. The information was not available in these data.
The analysis indicated that those households in which the heads were employed more hours ate a smaller percent of their meals at home. It would be of interest to examine just which meals those were. It would be of interest to examine the difference between which meals were eaten away from home in households where the female was employed compared with households where she was not employed, to see if the increase in meals away was primarily a function of lunches eaten away during the employment day, or whether it consisted of breakfasts and evening meals, too. An examination of the price paid per meal and the particular meals eaten away in different types of households would be of interest to assess differences in eating patterns between households that differ in composition, income, work status, and location.

Implications

There is still much to be known about the behavior of households with respect to household production of food and other commodities. The changes taking place in the society (especially the increase in women's work force activity) force changes in decisions that households make about household production and leisure activities. In attempting to maximize their satisfaction in the presence of the constraints of time, energy, and income, households may change the types of household production that they do, or the manner in which they do them. For example, they may do less primary household production or use more convenience foods for secondary household production.
Typically when social change occurs, habit persistence results in some lag in changes in certain behavior. Therefore, although women's work force behavior has changed in recent years, household production behavior may not have reached a satisfactory equilibrium, and may thus be different than it will be in the future.

It will be important to continue to chronicle and analyze changes that households make in household production activities and the standards that they set with respect to constraints of time, energy, and money.
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