



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Allocation of time for meal preparation in a transition economy

Wojciech J. Florkowski^{a,*}, Wanki Moon^a, Anna V.A. Resurreccion^b, Jordan Jordanov^c,
Pavlina Paraskova^c, Larry R. Beuchat^b, Kolyo Murgov^d, Manjeet S. Chinnan^b

^aDepartment of Agricultural & Applied Economics, The University of Georgia, Georgia Station, Griffin, GA. 30223, USA

^bCenter for Food Safety and Quality Enhancement, The University of Georgia, Georgia Station, Griffin, GA. 30223, USA

^cCanning Research Institute, 154 Vassil Aprilov Blvd., Plovdiv 4000, Bulgaria

^dDepartment of Agroinformatics, Agricultural University, 12 Mendeleev Street, Plovdiv 4000, Bulgaria

Received 30 July 1998; received in revised form 14 October 1999; accepted 13 November 1999

Abstract

The decision of how much time to allocate to meal preparation is an endogenous variable to be determined by the opportunity cost of time, preference between market and nonmarket goods and leisure, and household production technology. Using consumer survey data collected in Bulgaria in 1997, this study measured the effect of household income on the amount of time allocated to meal preparation after controlling the effects of demographic, socio-economic and other characteristics of households. We used the first-hurdle dominance model to distinguish non-meal preparers from meal preparers. Since the overall pattern of allocating time between market work, household activity and leisure in a particular country is likely to be conditional on the stage of its economic development, this study presents a unique opportunity to assess the rationality of the time allocation behavior of consumers in an economy in transition from a centrally-planned to a market-oriented system. Results showed that household income did not influence the decision of how much time to allocate to meal preparation. While the insignificant linkage between income and time allocation to meal preparation could be due to the differences in preference and household production technology. It can be also attributed to the legacy of four decades of a central-planning system and underdeveloped food manufacturing and service industries. © 2000 Elsevier Science B.V. All rights reserved.

Keywords: Time allocation; Household production technology; Transition economy; Household goods

Time allocated for meal preparation is a determinant of the types and quantity of foods purchased by households. The range of foods chosen from grocery shelves would be skewed toward processed or convenience foods if a household chooses to allocate only

a limited amount of time for meal preparation. In consequence, analysis of the behavior of allocating time to meal preparation is of profound importance in explaining food consumption patterns.

The behavior of allocating time to meal preparation can be analyzed within a theory developed by Becker (1965) and extended by Gronau (1977). To explain time allocation behavior, the theory uses a framework of utility maximization where households derive satisfaction from the consumption of three composite

* Corresponding author. Tel.: +1-770-228-7231/112; fax: +1-770-228-7208.

E-mail address: wflorko@gaes.griffin.peachnet.edu (W.J. Florkowski).

goods: goods and services purchased in the market, called 'market goods'; goods and services produced and consumed by the household, called 'household or nonmarket goods'; and leisure. Time is combined with purchased market goods to produce household goods, such as cooked and served meals (Bryant, 1990). The decision of how much time to allocate to meal preparation is an endogenous variable determined by the opportunity cost of time (a wage rate in competitive markets), households' preferences between market and nonmarket goods and leisure, and household production technology (e.g. substitutability between time and market inputs).

Using Becker's theory, this study examines consumer behavior of time allocation for meal preparation in an economy in transition from a centrally planned to a market-driven system. The analysis uses cross-sectional data collected in the summer of 1997 in Bulgaria. The overall pattern of allocating time between market work, production of household goods, and leisure in a particular country is very likely to be conditional on the stage of its economic development. Collected data present a unique opportunity to study the behavior of meal preparation time in an economy undergoing a transition. Higher opportunity cost of time in matured market economies leads to reduced time for household production activities and increased labor supply with subsequent changes in food purchasing behavior. For example, consumers in industrialized countries substitute home preparation of meals by purchasing ready-to-eat dishes, partially cooked meals, or eating out as an adjustment to the rise in the opportunity cost of time (Prochaska and Schrimper, 1973; Redman, 1980; Capps et al., 1985; McCracken and Brandt, 1987; Nayga, 1996; Manrique and Jensen, 1997; Price, 1999).

Since central planning has been relinquished in 1989, consumers in transition economies are increasingly being exposed to the market mechanism of coordinating and arranging economic activities in accordance with the prices of resources. While the transition process is far from being complete, an issue of interest is whether they resemble the behavior of consumers in mature market economies in allocating time to household activities and make time allocation decisions based on the price (opportunity cost) of time. This study tests and assesses the rationality of consumers' time allocation behavior in a transition econ-

omy by estimating the relationship between the amount of time allocated to meal preparation and household income as a proxy for the price of time after controlling the effects of sociodemographic profiles and geographic regions.

1. Bulgarian consumers in transition

Over the last decade, there have been some dramatic developments in the Bulgarian economy that affected consumer behavior, particularly with respect to food consumption. Food security was a national policy of the centrally planned economies. Under that system, food prices were kept low. Affordability was more important than a variety of food and food products. Rationing assured access to a fixed basket of goods and was augmented by the sale of non-rationed goods through queuing and the cultivation of private plots. Furthermore, in Bulgaria, as in most other centrally planned economies, at least the main meal served at mid-day was often eaten in cafeterias at state enterprises. Liquidation of the extensive system of cafeterias denied access to ready-to-eat meals, increasing the importance of home meal preparation. The termination of subsidies to production, processing, and distribution contributed to a sharp increase of food prices in Bulgaria. Although, Miller (1993) questioned the calculation of inflation rate in the early 1990s, consumer prices increased by 30,595% between 1990–96. In 1996 alone, food and service prices increased by 307% (OECD Economic Outlook, 1997).

Bulgarian consumers are expected to adjust their behavior to the new economic conditions. Changes in consumer behavior require adjustment in time allocated to meal preparation. The issue of allocating time to meal preparation could be different in an economy in transition, where food service and manufacturing industries are not fully developed and the decline in real incomes coincides with higher food prices and unemployment (Hobbs et al., 1997). With attention to those dramatic developments in the Bulgarian economy, this study addresses the empirical linkages of household income and other demographic and socio-economic characteristics of Bulgarian households to the amount of time allocated to meal preparation.

2. Demand for meal preparation time

A conceptual demand function for meal preparation time is derived using the framework of the time allocation theory of Becker (1965); Gronau (1973). Households are assumed to generate utility from the consumption of market goods, household-produced goods and leisure. Assuming a single-person household for simplicity, households maximize utility subject to three constraints of household production technology, budget and time available in a given period as shown below:

Max

$$U = U(M, H, L) \quad (1)$$

Subject to

$$H = H(T_H, X) \quad (2)$$

$$P_M M + P_X X = W T_M + V = I \quad (3)$$

$$T_M + T_H + L = T_0 \quad (4)$$

Eq. (1) is the household utility function where M stands for market goods, H represents nonmarket goods, and L is leisure; Eq. (2) is the household production function where T_H is time allocated to nonmarket activity and X is a vector of market inputs used in the process; Eq. (3) is a budget constraint where W denotes market wage rate, T_M is the time spent on wage-earning work, V represents other sources of income and P_M and P_X are the price of market goods (M) and inputs (X), respectively; and Eq. (4) represents a time constraint where T_0 is the total time available in a given period. To account for differences in demographic and socio-economic characteristics between households, we have modified the household production technology to be conditional on a vector of demographic and socio-economic characteristics (D), yielding

$$H = H(T_H, X; D) \quad (2')$$

The vector (D) includes gender, education, age, regions, household size and employment status. Maximizing the utility function subject to the three constraints yields optimal allocation of time and optimal levels for market goods (M^*), nonmarket goods (H^*) and leisure (L^*). Each demand function can be expressed as:

$$M^* = M^*(P_X, P_M, W, V; D) \quad (5)$$

$$H^* = H^*(P_X, P_M, W, V; D) \quad (6)$$

$$L^* = L^*(P_X, P_M, W, V; D) \quad (7)$$

Given the optimal level of nonmarket goods (H^*), the next step is to choose the technology minimizing the cost of producing H^* . Minimizing cost of producing H^* subject to household production technology, $H = H(T_H, X; D)$, yields the optimal cost function:

$$C^* = C^*(P_X, W, H^*; D) \quad (8)$$

Application of the envelope theorem (Sheppard's lemma) with respect to W and P_X in Eq. (8) yields demand functions for time (T_H) and market inputs (X) as follows:

$$T_H^* = T_H^*[W, P_X, H^*; D, \text{parameters of the household utility and production functions}]$$

$$X^* = X^*[W, P_X, H^*; D, \text{parameters of the household utility and production functions}]$$

For simplicity of analysis, this study assumes that household production includes only three meals of breakfast, lunch, and dinner. Assuming that the labor market is in the range of the positively sloped supply curve, the direction of the effect of an increase in market wage rate (increase in the opportunity cost of time) on meal preparation time depends on the relative magnitudes of direct substitution, indirect substitution and income effects. The direct substitution effect represents a change in the use of time in producing meals caused directly by the change in the wage rate. The direct substitution effect has a negative sign, suggesting an inverse relationship between the time spent on meal preparation and the wage rate, *ceteris paribus*. The indirect substitution effect represents the effect of a wage rate change on the time allocated to leisure. Changing time allocated for leisure affects the time used to produce meals because of the constraint on the total available time. The signs of indirect substitution and income effects are ambiguous and depend on the shapes of production and utility functions. Generally, the direct substitution effect dominates the other two effects, resulting in a decrease in meal preparing time (Gramm, 1974).

Substitution or complementarity between time and market inputs in the household production process determine the sign of the price index of market inputs

(food ingredients) on time allocated to household activities, T_H . While a complementarity appears reasonable between the two variables, the availability of convenience or prepared and expensive foods which can reduce meal preparation time complicates the relationship. Consideration of the monetary value of food ingredients instead of quantity makes time a substitute for food ingredients. Therefore, the relationship between time and market inputs also depends on consumer preferences between processed and unprocessed foods. In this study, consumers are assumed to face the same prices because of the cross-sectional nature of the data, although prices may differ across geographic regions. In addition to those economic factors, household and respondent characteristics included in the vector (D) may exert an influence because of typical economic conditions of a transition economy where markets are likely to be imperfect in valuing the opportunity cost of time.

3. Data and two-stage behavior model

Data for this study were collected in Bulgaria in June 1997, with the purpose of obtaining insights about consumers' food purchasing and eating behavior in a transition economy. The survey instrument was drafted by a team of researchers from the United States and Bulgaria and tested on Bulgarian consumers. Special care was taken to assure proper translation of the questionnaire in English into an equivalent version in Bulgarian before distributing it to 2500 individuals; 2133 returned completed questionnaires. The high response rate (85.3%) was possible thanks to the assistance of the Bulgarian National Statistical Service which enabled the distribution of the questionnaires through the national household panel. The questionnaires were delivered in-person by enumerators in 28 statistical districts throughout Bulgaria and collected 4 weeks later. A number of questionnaires were included in the questionnaire probing for consumer purchasing and eating habits along with demographic and socio-economic information about the respondents and households.

Questions asking about the time allocated to prepare breakfast, dinner (mid-day meal), and supper were included in the survey. Respondents reported

meal preparation time of each type on an average day in minutes. Time spent on preparing breakfast, dinner, and supper ranged from 0 to about 2 h. Respondents who did not allocate time for preparing meals on an average day could still eat meals prepared by other household members, indicating that they do not participate in meal preparation. Their time allocation behavior is qualitatively different from respondents reporting positive amount of meal preparation time, necessitating the use of a two-stage decision model that would distinguish non-meal preparers from meal preparers.

Double-hurdle or Heckman's sample selection (first-hurdle dominance) models have been useful in modeling two-stage decision processes in demand or consumption analyses (Cragg, 1971; Heckman, 1979; Blaylock and Blisard, 1992). While double-hurdle models allow zeros to be either nonparticipants or those who have selected not to allocate time to prepare meal at this particular point of time, the first-hurdle dominance model is structured to ensure that all zeros represent non-participants (Jones, 1989; Ward and Moon, 1995).

Given that the zeros in the current data are indicative of non-participants, we use the first-hurdle dominance model to explore the time allocation behavior of consumers in a transition economy. Let's define ξ to be the first-stage decision variable taking one if a consumer participates in meal preparation and zero otherwise. Then, decision rules of the first-hurdle dominance model can be represented by the following model:

$$\begin{aligned} T_H^* &= X\beta + u, & \xi &= Z\theta + e, \\ T_H &= T_H^*, & \text{if } \xi &> 0, \\ &= 0, & \text{if } \xi &= 0 \end{aligned} \quad (11)$$

where T_H is actually observed amount of time allocated to meal preparation, and T_H^* being utility maximizing amount of time; Z is a vector of variables influencing the decision of whether to participate in preparing meals; and X being a vector of variables influencing the decision of how much time to allocate to meal preparation. The model shows that once a respondent decides to allocate time to prepare meals, the utility maximizing amount of time is identical with actually observed amount of time.

The first-hurdle dominance model is represented by the log-likelihood function as:

$$\begin{aligned} \ln L &= \sum_0 \ln[1 - \Pr(\xi = 1)] + \sum_1 \ln \Pr(\xi = 1) \\ &+ \sum_1 \ln \phi(T_H^* | \xi = 1) \\ &= \sum_0 \ln(1 - \Phi(Z\theta)) + \sum_1 \ln \left[\frac{\phi(T_H^* - Z\beta)}{\sigma} \right] \\ &+ \sum_1 \ln \Phi \left[\frac{Z\theta + \rho(T_H^* - X\beta)/\sigma}{1 - \rho^2} \right] \end{aligned} \quad (12)$$

where ϕ and Φ denote standard normal density and cumulative distribution functions, respectively. The model is estimated by assuming u and e are joint normally distributed with variances $(\sigma^2, 1)$ and correlation coefficient (ρ). If correlation coefficient between the first and second stage equations is zero, the model is simplified as:

$$\begin{aligned} \ln L &= \sum_0 \ln(1 - \Phi(Z\theta)) + \sum_1 \ln \Phi(Z\theta) \\ &+ \sum_1 \ln \left[\frac{\phi(T_H^* - Z\beta)}{\sigma} \right] \end{aligned} \quad (13)$$

which can be separated into the probit for the participation decision and ordinary least squares (OLS) for the amount of time allocated to meal preparation, yielding a complete dominance model.

4. Empirical model specification

We assume that the decision of whether to participate in meal preparation is affected by personal characteristics but not by external environmental factors. Hence, the vector Z is composed of only respondent-specific demographic variables including gender, age, education, income, employment status and household size. Female respondents are more likely to participate in meal preparation. Also, employed respondents with higher income are expected to have lower probability to allocate time to meal preparation. Once a respondent chooses to participate in meal preparation, the decision of how much time to allocate to meal preparation is hypothesized to be affected by geographic regions, garden ownership and other factors in addition to the respondent-specific demographic characteristics.

Although, market wage rate is the theoretically relevant variable in time allocation models, the Bul-

garian data include household income which is defined to consist of incomes of all household members¹. Bloch (1973) and Gramm (1974) empirically showed that wage income of the wife in the US has a negative effect on the amount of time she spends on nonmarket activities, including cooking. Higher household incomes allow the purchase of food ingredients and services that make meal preparation easier and within less time. For instance, Redman (1980) observed that family income had a positive effect on expenditures of prepared foods in the United States. Hence, household income is expected to measure both the impacts of the opportunity cost of time (market wage rate) and the monetary ability to purchase more processed foods. A negative relationship is hypothesized between household income and time allocated to meal preparation.

The data include a measure of perception about the importance of freshness of foods. Consumers who consider food freshness an important attribute are expected to purchase minimally processed food ingredients. The use of such ingredients requires more time to prepare a meal. The dependent variable and the perception of freshness are expected to be positively related. Perceptions about the importance of each of the three meals in the households are also revealed in the data. The variables are designed to measure household attitudes about the roles of each meal in family tradition and customs.

Uncertainty brought about by the transition process has increased concerns about food consumption. Prior to the transition, many households, especially in rural areas, had access to small plots of land. These plots produced a substantial volume of food products, mostly fruit and vegetables. Accurate information about the extent to which such production supplements food consumption is not available (Mishev et al., 1994). However, it was estimated that about 40% of households were cultivating gardens of various sizes. The ownership of the garden was reported in this survey. A binary variable reflecting garden ownership

¹ Since the household income depends on both the wage rate and the amount of time allocated to work, the household income would not measure the pure effect of wage rate (Cochrane and Logan, 1977). Instead, it will overestimate the effect of wage rate by the amount of increased time for work, strengthening the negative relationship between wage and meal preparation time.

was included in the empirical model because food production for home consumption implies access to raw foods which require processing within the household. The need for processing home grown food can increase the meal preparation time.

In an established free market economy, more education would imply higher market wage. In Bulgaria, such a relationship may not be clearly pronounced because adjustments in the economy and labor markets are associated with re-evaluation of education in terms of emerging economic opportunities, restructuring of government and severe budget limitations affecting services directly provided by the state. Shifting labor demand, changes in quality and level of service may lead to job loss, even among the university graduates. Our data suggest a low correlation between household income and education of the respondents, eliminating the potential of a multicollinearity problem.

Age is expected to positively influence time allocation for meal preparation. Older consumers are more likely to have retired and organize their daily activities without the need to set aside time to work for a wage. For consumers who have not retired, the relative importance of meals may vary, and they may be willing to devote more time for preparing one meal, but not the other, for example, dinner versus supper. However, due to time availability changes with age, it is reasonable to expect a positive relationship between the respondent's age and time allocated for meal preparation.

Time available for meal preparation to a consumer who is fully employed decreases. Therefore, a negative relationship would be expected between employment status and time allocated to meal preparation. Bulgarian culture and tradition places the responsibility of meal preparation on female members of the household. This tradition is supported by observing both employed and unemployed women engaged in meal preparation and activities associated with meal preparation, for example, shopping. Therefore, the amount of time spent on meal preparation is expected to be positively associated with female respondents. Meal preparation time is directly and positively influenced by the household size. In this study, household size is measured by the number of children and adults. Preparation of a meal for a larger household would require more effort and time.

Geographic regions designated as Southern, Coastal, Mountain, and Metropolitan represent four variables. The creation of variables depicting these regions was dictated by differences in the level of economic activity, sectors of primary importance to a region, natural resource endowment, culture and traditions. Farm sector restructuring also occurs at different rates across regions (Cochrane, 1994). Division into regions is supported by the termination of government policy to redistribute state investments across regions. As in other countries in Central and Eastern Europe, regional disparities have become more pronounced during the transition and could influence food consumption habits, including the amount of time allocated for meal preparation. The southern region was omitted from the empirical model and served as a base for estimation. Table 1 shows definitions and descriptive statistics of the variables used in the empirical estimation.

5. Results

The first-hurdle dominance model represented by Eq. (12) was estimated for breakfast, dinner, and supper by maximum likelihood method. Estimated correlation coefficients were not found to be statistically different from zero, indicating that the participation decision was made independently from the decision of how much time to allocate to meal preparation. Hence, we estimated complete dominance model represented by Eq. (13) for the three types of meals. Estimated coefficients and t-statistics are reported in Table 2 along with other summary statistics.

Estimated results showed that participation decision was strongly associated with income, gender and age across the three types of meals. Respondents with higher household income had lower probability to participate in meal preparation. As expected, females were more likely to participate in meal preparation than males. Older respondents were more prone to choose to participate in meal preparation than were younger respondents. Employment status and education had somewhat intriguing effects on the participation decision. Employed respondents were not less likely to participate in meal preparation across the three types of meals than unemployed respondents.

Table 1
Definitions and descriptive statistics of the variables used in the estimation

Variable	Description	Mean	St. dev.
<i>Meal preparation time</i>	Actual time spent on each meal (min)		
Breakfast		20.3	10.58
Dinner		62.3	30.31
Supper		54.7	26.20
<i>Perception of meal importance</i>	1 = least imp.; 2 = not imp.; 3 = neither imp. nor unimp.; 4 = imp.; 5 = very imp.		
Breakfast		3.83	1.0618
Dinner		4.18	0.6631
Supper		4.17	0.7017
Household income (in leva) ^a	1 = 10,000 or less; 2 = 10,001–20,000; 3 = 20,001–30,000; 4 = 30,001–40,000; 5 = 40,001–50,000; 6 = 50,001 or up	1.67	1.0173
Perception of food freshness	1 = not imp.; 2 = somewhat imp.; 3 = imp.; 4 = very imp.	3.77	0.4786
Garden ownership	1 = owns a garden; 0 = otherwise	0.48	
Household size	Actual number of household members	2.86	1.4746
Education	1 = 4 year; 2 = 7 year; 3 = voc.; 4 = high; 5 = tech.; 6 = junior; 7 = univ.; 8 = postgraduate	3.82	1.8844
Employment status	1 = employed; 0 = otherwise	0.40	0.4907
Gender	1 = female; 0 = otherwise	0.67	0.4862
Age	Actual age in years	43.78	38.37
Coastal	1 = coastal; 0 = otherwise	0.21	
Northern	1 = northern; 0 = otherwise	0.23	
Metropolitan	1 = metropolitan; 0 = otherwise	0.27	

^a Mid-point of each household income category (in leva) was used in estimating the empirical models. Source: National Consumer Survey, Bulgaria, 1997.

Also, consumers with more education were more likely to participate in preparing dinner and supper. In addition, respondents with larger household size were less likely to participate in preparing dinner and supper.

The negative effects of household income on the amount of time allocated to meal preparation (Table 2) were not statistically significant, indicating that time allocation behavior of consumers with higher household income was not different from those with lower household income. Becker's time allocation theory argues that the allocation of time to household production of meals depends on how the household values the time spent on meal preparation relative to the alternative uses of time. If income increases and substitution effect dominates, then the theory predicts a decrease in the amount of time spent for meal preparation. In fact, a negative linkage between income and time spent on household production activities, such as cooking, cleaning or laundry in mature market economies has been empirically established by

previous researches (Bloch, 1973; Gramm, 1974; Gronau, 1977).

The insignificant linkage between income and time allocated to meal preparation could be indicative of the differences in preference (valuation of nonmarket household goods) and efficiency of household production technology between households in the United States and Bulgaria. Bulgarian consumers may attach higher value to nonmarket household goods in relation to market goods and leisure than American consumers. When households combine time and market inputs (food ingredients) to produce nonmarket household goods (e.g. cooked meals), the efficiency depends on appliances and housing characteristics that tend to be fixed for any household in the short run (Bryant, 1990). Inefficient household production technology can lead to lower labor productivity, requiring more time in preparing meals.

Alternatively, the linkage of time allocation to income could have been limited by underdeveloped food manufacturing and service industries offering

Table 2
Parameter estimates from the complete dominance model^a

	Breakfast		Dinner		Supper	
	Participation	Time allocation	Participation	Time allocation	Participation	Time allocation
Constant	0.7936(2.79) ^{***}	3.6171(1.05)	0.7141(2.43) ^{**}	-14.613(1.68) [*]	0.6965(2.37) ^{**}	10.330(0.93)
Perception of meal importance	-	1.0723(3.96) ^{***}	-	4.0890(4.15) ^{***}	-	3.0842(2.57) ^{**}
Perception of food freshness	-	1.2444(1.73) [*]	-	5.6801(3.34) ^{***}	-	6.3652(2.93) ^{***}
Garden ownership	-	1.3459(2.31) ^{**}	-	2.5099(1.81) [*]	-	0.3507(0.19)
Household income	-0.0882(2.25) ^{**}	0.0100(0.04)	-0.0720(1.69) [*]	-0.7306(1.07)	-0.0845(2.01) ^{**}	-0.6294(0.72)
Education	0.0028(0.11)	-0.2633(1.57)	0.0572(1.99) ^{**}	-0.0851(0.21)	0.0566(1.97) ^{**}	-1.2860(2.52) ^{***}
Age	0.0066(2.17) ^{**}	0.0789(3.71) ^{***}	0.0062(1.95) ^{**}	0.2719(5.33) ^{***}	0.0058(1.84) [*]	0.0100(0.15)
Employment status	0.0084(0.08)	-1.4552(2.19) ^{**}	0.0052(0.05)	0.4821(0.30)	0.0567(0.53)	1.3942(0.68)
Gender	0.8534(9.75) ^{***}	2.4288(4.09) ^{***}	1.2158(12.4) ^{**}	10.552(7.35) ^{***}	1.2000(12.3) ^{***}	5.3582(2.91) ^{***}
Household size	-0.0180(0.51)	1.4151(6.26) ^{***}	-0.0977(2.70) ^{***}	3.2668(6.10) ^{***}	-0.0825(2.29) ^{**}	2.9963(4.33) ^{***}
Coastal region	-	-2.0402(2.23) ^{**}	-	-1.0079(0.46)	-	-2.8827(1.02)
Northern region	-	-0.5278(0.71)	-	10.101(5.76) ^{***}	-	0.6667(0.29)
Metropolitan region	-	-4.0087(5.52) ^{***}	-	0.6642(0.38)	-	-7.3877(3.34) ^{***}
Number of observations	2039		2034		2029	
Percentage of positives	0.9195		0.9198		0.9206	
Log <i>L</i> values	-7736.1		-9303.0		-9287.7	
Log <i>L</i> values ($\beta = \theta = 0$)	-8070.9		-9745.1		-10119.3	
χ^2 -statistics	669.6 ^{***}		884.2 ^{***}		1663.2 ^{***}	

^a * $P < 0.1$; ** $P < 0.05$; and *** $P < 0.01$.

convenience market inputs, such as ready-to-eat dishes or partially cooked meals or due to the inertia that may be characteristic of consumers undergoing transition to a market economy from a centrally-planned system. It appears that both inadequate supply side conditions of convenient food ingredients and rationality bounded by the legacy of four decades of centrally planned system contributed to the limited association of time allocation with income levels.

The role of tradition in time allocation decisions is supported by the highly significant and positive impacts of perception about the importance of each meal on meal preparation time. The variables represent household preference for nonmarket household activities. When a consumer considers a particular meal important within a household, more time is allocated on preparing that meal. This result suggests that subjective perceptions continue to strongly influence time allocation decisions even after the central planning system has been replaced by market-oriented economy.

The ownership of a garden increased the time allocated for breakfast and dinner preparation, but did not have a significant impact on the time spent on supper preparation. Home raised produce requires preparation usually performed by the marketing channel if the product is purchased. Dinner, typically includes fresh vegetables as an ingredient in the main dish or a salad. Foods eaten for breakfast include dishes and products that can be eaten in different forms. For example, pickled vegetables prepared in advance can be served relatively quickly, but an emphasis on freshness and easy access to garden may extend the amount of time Bulgarian respondents were willing to spend preparing breakfast.

Perception about the importance of food freshness was found to positively and significantly affect the amount of time allocated for the preparation of all meals. Households concerned about freshness of food ingredients are likely to purchase these ingredients and allocate extra time for preparing meals. Typically, in Bulgaria, dinner and supper may include hot dishes, while breakfast may be limited to a cold sandwich. Bulgarian bread remains in good sensorial condition for at least 2 days, and as a major breakfast food together with porridge, meets expectations with regard to freshness. Retention of sensory qualities of other foods could be more important for dinner and

supper menus because preparation of these meals requires a wider variety of ingredients, including produce, meat, and dairy products which are more perishable than bread and dry grain products used in porridges.

It is interesting to note that education had a positive impact on the participation decision for dinner and supper, while having a negative effect on the amount of time allocated to prepare supper. The contrasting result indicates that consumers with higher education are more likely to participate in preparing meals but the amount of time allocated to meal preparation would be smaller than those with less education and participating in meal preparation. Consistent with an insignificant effect on the participation decision, employment status of the respondents did not have statistically significant effects on dinner and supper. The insignificance of employment status on time allocation decisions may be associated with the insecurity of jobs in transition economies where many of the jobs are not real-jobs: workers may not put in full-time and do not get paid.

Gender (female) had a uniformly positive and significant influence on the amount of time allocated for the three meals. The result was expected to reflect a traditional division of household tasks between gender. In addition, females were more likely than men to become unemployed as state industries restructure and their opportunity cost of time may be quite low. Age also influenced the amount of time allocated to breakfast and dinner. Older respondents were more likely to have retired and primarily responsible for meal preparation.

The Southern region was selected as the benchmark region for comparison of regional impacts. This region has relatively balanced economy of industry, food processing and agricultural and horticultural production. The region is also a center of trade shows. Results show that location variables have a clear impact on time allocation decisions in Bulgaria. In particular, respondents residing in Metropolitan region as compared to those from the Southern region spent significantly less time on preparing breakfast and supper, while spending more time on preparing dinner. Consumers in the Mountain region spent considerably more time on preparing dinner than those from the Southern region, while residents of the Coastal region spent less time on preparing breakfast.

6. Implications

This study addressed time allocation decisions faced by consumers in a transition economy using a two-stage decision model that distinguishes non-meal preparers from meal preparers. While participation decision was strongly associated with household income, the amount of time allocated to meal preparation was not. These results illustrated that rationality of consumers in a transition economy could have been restricted by inadequate supply conditions of convenience foods and the legacy of four decades of central-planning system where prices had not played important roles in guiding resource allocation. As the economy increasingly adopts market mechanism, consumer preference is expected to play a central role in allocating resources to various industries, and consumer-oriented food manufacturing or service industry offering value-added food products is likely to be one of the first to emerge, potentially enabling consumers to respond rationally to the rise in the opportunity cost of time.

The greater flexibility of a market economy will reward the measurable skills sought after by the growing sectors of the economy. Higher educational attainment level leads to higher wages and suggests that better educated will spend less time on meal preparation, although in this study the existence of such relationship was confirmed only for time spent on preparing supper. Market segmentation, based on education and income trends, will offer opportunities for the food processing industry as consumers will purchase food and services making the meal preparation shorter. Bulgarian consumers will be inclined to try a wider variety of foods revising their preferences and create the demand for new foods.

Employment will become increasingly important in allocating time to meal preparation. The confirmed impact of employment on time devoted for breakfast preparation will follow the observed trends in industrialized countries. Breakfast is the most often skipped meal in the United States, and many quick and easy meals have been developed to relax consumer time constraints. If such products can meet tastes of Bulgarian consumers, food manufacturing industry will assure supplies. Already in Bulgaria, as in other economies in transition, those willing to work, aggressively seek ways to supplement their income, often

working additional jobs. The allocation of more time for work, leaves less time for meal preparation and prepared foods may be substituted for less processed ingredients.

This study provided evidence of regional differences in meal preparation time. Households in the Metropolitan region used less time on preparing breakfast and supper than in the benchmark Southern region. Changing economic conditions affected consumers in the Metropolitan region earlier than elsewhere and caused a shift of time away from meal preparation. Future studies should address regional variations in consumption patterns to advance understanding of time allocation differences regarding the main meal of the day (dinner). Observations from other transition economies show that economic growth is uneven across the regions and influences the type of food products purchased and prepared by consumers.

Vegetables are grown almost universally by small gardeners in Bulgaria. Garden ownership increases availability of unprocessed foods leading to allocation of additional preparation time in case of breakfast and dinner, according to the results. The types of dishes served at different meals vary, and dinner includes dishes containing vegetables. It is expected that as household incomes improve, the importance of raising food will diminish, and the time allocated for meal preparation will decrease. The cultivated plots will begin to perform recreational function and edible crops will be substituted by ornamentals. Such trends can be observed following the unification of Germany in eastern parts of that country, as well as in parts of the Czech Republic and Hungary.

The regimented system of controlled employment and consumption dictated the allocation of time prior to the transition. Government policies assured everybody a job at a regulated wage rate. Under such circumstances, individual decisions about the use of time were not based on true price of time. The transition to a market economy initiated changes in the interpretation of the value of time, and consumers are in the process of adjusting the division of time among competing activities including meal preparation. At present, quickly developing food distribution and retailing sector supplies mostly goods that are minimally processed. Development of food processing and manufacturing or food service industries

would enable consumers with high wage rate to replace unprocessed commodities with value-added food products which can save meal preparation time. Then, the role of income in time allocation decision of consumers in transition economies is expected to grow along with enhanced efficiency of combining time and market inputs and increased substitutability between the two inputs in household production technology.

Acknowledgements

This research was supported in part by the Peanut Collaborative Research Program of US Agency for International Development, USAID grant No. DAN-4048-G-0041-00 and the Hatch funds.

References

- Becker, G., 1965. A theory of allocation of time. *Econ. J.* 75, 493–517.
- Blaylock, J.R., Blisard, W.N., 1992. US cigarette consumption: the case of low-income women. *Am. J. Agric. Econ.* 74, 699–705.
- Bloch, F., 1973. The allocation of time to market and non-market work within a family unit. Technical Report No. 114, Inst. Math. Studies Soc. Sci., Stanford University.
- Bryant, W.K., 1990. *The Economic Organization of the Household*. Cambridge University Press, Cambridge, NY, 286 pp.
- Capps Jr., O., Tedford, J., Havlicek, J., 1985. Household demand for convenience and nonconvenience food. *Am. J. Agric. Econ.* 67, 862–874.
- Cochrane, N., 1994. Farm restructuring in Central and Eastern Europe. *Soviet Post-Soviet Rev.* 21, 319–335.
- Cochrane, S.H., Logan, S.P., 1977. The demand for wife's nonmarket time: a comparison of results from surveys of Chicago school teachers and South Carolina college graduates. *Southern Econ. J.*, pp. 285–293.
- Cragg, J.G., 1971. Some statistical models for limited dependent variables with application to the demand for durable goods. *Econometrica* 39, 829–844.
- Gramm, W.L., 1974. The demand for the wife's nonmarket time. *Southern Econ. J.*, July, pp. 124–133.
- Gronau, R., 1973. The intrafamily allocation of time: the value of the housewives' time. *Am. Econ. Rev.* 63, 634–651.
- Gronau, R., 1977. Leisure, home production, and work: the theory of the allocation of time revisited. *J. Pol. Econ.* 85, 1099–1123.
- Heckman, J.J., 1979. Sample selection bias as a specification error. *Econometrica* 47, 153–161.
- Hobbs, J.E., Kerr, W.A., Gaisford, J.D., 1997. *The Transformation of the Agrifood System in Central and Eastern Europe and the New Independent States*. Cabb International, New York, NY, 394 pp.
- Jones, A.M., 1989. A double-hurdle model of cigarette consumption. *J. Appl. Econ.* 4, 23–39.
- Manrique, J., Jensen, H.H., 1997. Spanish household demand for convenience meat products. *Agribusiness* 13, 579–586.
- McCracken, V.A., Brandt, J.A., 1987. Household consumption of food-away-home: total expenditure and by type of food facility. *Am. J. Agric. Econ.* 69, 274–284.
- Miller, J.B., 1993. *The Price Index Gap: A Window to Understanding Bulgarian Economy*. Working Paper. University of Delaware, Newark, DE.
- Mishev, P., Young, M.N., Hughes, D., Hamm, S., 1994. Improving markets and marketing. In: Schmitz, A., Moulton, K., Buckwell, A., Davidowa, S. (Eds.), *Privatization of Agriculture in New Market Economies Lessons from Bulgaria*. Kluwer Academic Publishers, Dordrecht, pp. 335–355.
- Nayga Jr., R.M., 1996. Analysis of food away from home expenditures by meal occasion. *Agribusiness* 12, 421–427.
- OECD, 1997. *OECD Economic Outlook*. December.
- Price, C.C., 1999. Sales of meals and snacks away from home continue to increase. *Food Rev. USDA ERS* 21(3), 28–30.
- Prochaska, F., Schrimper, R., 1973. Opportunity cost of time and other socio-economic effects on away-from-home food consumption. *Am. J. Agric. Econ.* 55, 595–602.
- Redman, B., 1980. The impact of women's time allocation on expenditure for meals away from home and prepared foods. *Am. J. Agric. Econ.* 62, 234–239.
- Ward, R.W., Moon, W., 1995. Evaluating beef checkoff programs: an alternative approach. In: Kinnucan, H.W., Lenz, J.E., Clary, C.R. (Eds.), *Economic Analysis of Meat Promotion*. Cornell University Press, Ithaca, NY, pp. 67–78.

