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CHOICE OF FOODS
- allocation of time and money,
household production and market
services.

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Preface

Do households or individuals behave in a rational way is an everlasting question. What do we understand by rational and how do we operationalize this term in empirical research work, and last but not least, how do we interpret the results found. This report tries to narrow these questions into economic terms, particularly in respect to the choice of foods. Do households choose foods with preparation rates in accordance with their time and money restrictions; this is what we try to uncover in this project.

The main issue of this report is theoretical and methodological, explaining the relevant theory, developing and describing an adequate methodology. Here in particular, I feel indebted to fil. dr. Jan Lindvall, Linköping University, for his significant research work, which has very much influenced this report. The report also contains some empirical results, which have required a classification of foods after having been prepared in the household, to which the home economist students Malene Sloth and Joan Preisler, Suhr's Seminarium, Educational College for Nutritional and Consumer Studies, and sociologist Margit Groth, the National Food Agency of Denmark, have made important contributions. The data-processing has been carefully performed by the Kristian Koktvedgaard, student of economics. In a coming report further estimations together with some international comparisons of the behaviour of selecting foods will appear.

The research work is part of the MAPP-programme (Market-based Process and Product Innovation in the Food Sector) and is carried out at the Institute of Economics, University of Copenhagen.

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Copenhagen, September 1992*

Executive summary

1. Households' choice of food products can be analysed from various perspectives with different scientific backgrounds. Choice of food products is, e.g., to a large degree a question of cultural and environmental factors. One additional possible way to analyse choice of food products is to examine to which degree such choices are rational - i.e., lead to maximum obtainable welfare under given constraints.

2. The rational choice of food products can be analysed using modern extensions of the neo-classical theory of consumer behaviour. Such theories view the preparation of meals as a case of household production with four kinds of input: the food products bought, the time used for shopping, cooking, and washing up, household capital like kitchen appliances, and human capital like cooking skills. Maximum welfare will result when these inputs are optimised given the household's constraints of disposable income and disposable time.

3. In recent decades, women's participation in the labour market has increased significantly, with non-employed women becoming employed part-time, and part-time employed women becoming employed full-time. Even though men's working time has decreased somewhat in the same period, the overall disposable time for households has been going down. At the same time, incomes have been rising. Rational economic behaviour would imply that households react to these changed constraints by employing time-saving and time-buying strategies in meal preparation.

4. Such strategies may take various forms. Time buying may entail a) investing into additional household equipment (microwave ovens, dishwashers), b) buy food products which have a higher degree of convenience, c) eating out, and d) hiring paid help. Time saving may entail a) increasing productivity in household work, and b) redistributing household work among family members.

5. In order to analyse whether Danish households do in fact act rationally in the way described, it is necessary to classify households by their disposable income and their disposable time. In addition, it is necessary to classify food products by their degree of convenience. To this end, foods were classified on two dimensions: non-convenience/semi-convenience/convenience, and main meals/accessory stuff/lunch-breakfast, resulting in 9 food categories. In addition, snacks were used as a 10th category.

6. The results show that of all household expenses for main meals, about two thirds are in the non-convenience category. For lunch-breakfast, semi-convenient and convenient products account for 40% of the total expenses. Snacks account for 18% of the total food budget. There is considerable variation between households.

7. Relating expenditures for these 10 food categories to households' disposable time and income, one finds that convenient foods account for 22.9% per cent of the expenditures for households with least disposable income and most disposable time, whereas they account for 41.4% for the households with the highest disposable income and lowest disposable time. Households between these extremes confirm to the pattern that the higher the disposable income and the lower the disposable time, the higher the expenditures on convenient instead of semi-convenient or non-convenient foods. This indicates that Danish households indeed react rationally to changes in their money and time budgets.

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Introduction

After World War II the shortage of food in Western economies was replaced by abundance. Deficiency diseases were replaced by diseases caused by over-indulgence. A comfortable existence with sedentary work, cars instead of bicycles, and television in the evenings, decreased the need for fat, concentrated energy, but increased the need for nourishment.

Why did food habits not change in accordance with the new living conditions? Why are nutritional recommendations not heeded? In order to throw light on these questions, we have to find an answer to an even more fundamental question, i.e., which factors determine our choice of foods and the way in which we organize food preparation?

Various scientific disciplines are required to answer these questions. We know that eating is not only a question of taking in nutrition, it is also a social performance, where standards, attitudes, surroundings etc. determine the rules and our choice of foods. This does not imply, however, that these traditions are fixed and permanent. They may have been determined by rational reasons at one time such as hygiene, fear of sickness, and financial resources. Therefore, explaining the choice of foods requires social science, humanistic science and natural science.

In this report the priority is given to social science, where an economic approach is the theoretical and methodological point of origin. First, however, the concept of economic approach is defined by discussing the contribution of other social science disciplines in the field of consumer choice of foods.

Later the appropriate economic theory is briefly described, and a variety of time-saving and time-buying strategies are discussed on a general level to illustrate an important aspect, when analyzing rational behaviour.

The methodology used is of course the main frame work for the empirical analyses. Beside the definition of different household production methods, i.e. diets, analyses must be structured, e.g. by a normative classification of foods in food regimes, and the definition of household characteristics in terms of productivity, income and time variables, all with the object of making estimations on the basis of the Consumer Expenditure Survey.

This report is concluded with a presentation of some results in an attempt to verify the hypothesis that households behave in a economical rational way by substituting time and money when choosing foods with different kinds of preparation.

In a following report a more detailed empirical analysis will appear. Furthermore my ambition is to compare household behaviour in food choice in different countries.

Choice of Foods

Irrational and rational

"Man feeds not only on proteins, fats, carbohydrates, but also on symbols, myths, fantasies", Fischler (1980) says, followed by Lévi-Strauss who says that things must be "not only good to eat, but also good to think". These statements offer part of an explanation as to why human food habits are so difficult to ascribe to anything other than *intrinsic* coherence, and why they look arbitrary at first sight (Fischler, 1980). This is also why "cultural patterns have overridden man's natural ability to balance his diet and his calorie expenditure in the most beneficial way", (Beidler, 1975).

What these anthropologists and sociologists suggest is that food habits are essential for the identification of ourselves as human beings, or according to Fishler (1988, p. 276) "HOMO SAPIENS food not only nourishes but also signifies". We are what we eat, it has been said, and whether we are aware of it or not, our cooking is a reflection of our living conditions and the way we handle them, as well as an illustration of our culture. "If we do not know what we eat, how can we know what we are?" (Fischler, 1988, p. 282).

However, the consumption pattern is not the same for various groups of the population, at least not at the same time.

In "The Theory of the Leisure Class" Veblen (1986, 1. edition 1899) refers to conspicuous consumption as consumption of valuable goods, which is a means for the gentleman of leisure to make a reputation for himself. He "...not only consumes of the staff of life beyond the minimum required for subsistence and physical efficiency, but his consumption also undergoes a specialization as regards the quality of the goods consumed" ... "the motive principle and the proximate aim of innovation is no doubt the higher efficiency of the improved and more elaborate products for personal comfort and well-being" (p. 73,74). In this way the gentleman discriminates between the noble and the ignoble in consumable goods. "He becomes a connoisseur in creditable viands of various degrees of merit."

Over time, however, wealth accumulates and man's ability to consume saturates, inducing him to give valuable presents and expensive feasts and entertainment to his friends and competitors - or his wife -, and we have vicarious consumption. In this way the so-called "leisure class stands at the head of the social structure in point of reputability; and its manner of life and its standards of worth therefore afford the norm of reputability for the community" (Veblen, 1986, p. 84). In this way the upper classes become trend setters, which causes the members of each stratum to accept as their ideal of decency the scheme of life in vogue in the next higher stratum. We have a process determining the consumption pattern, which is based on social differences in the population.

In economic terms we refer to different preferences, which is not an accurate concept compared to the view in other social sciences. Therefore, when Veblen says "Whatever form of expenditure the consumer chooses, or whatever end he seeks in making his choice, has utility

to him by virtue of his preference" (p. 98), it is based on a theory of the social structure, where habits, norms, etc. are important aspects.

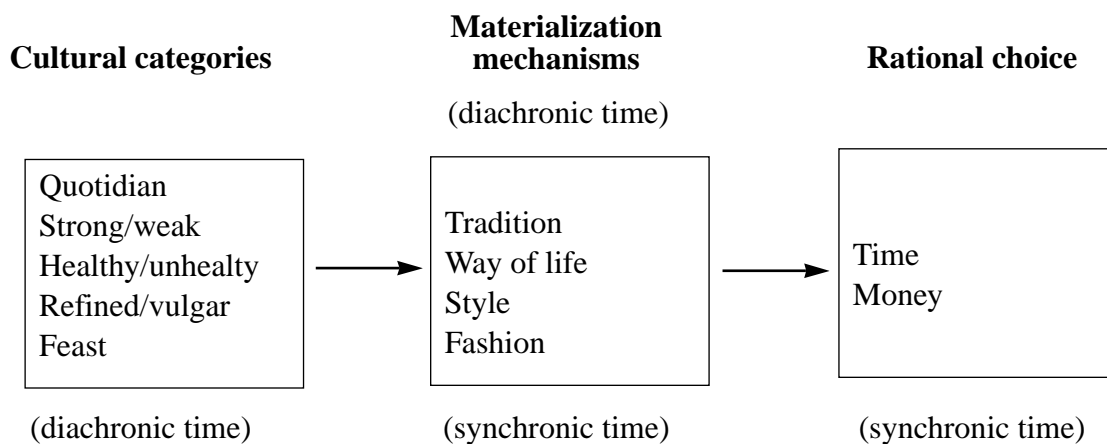
The choice of foods may be understood in the context of social, cultural as well as natural circumstances, and irrational as well as rational consumer behaviour. Nutrition is only one argument for buying a certain kind of food.

Structures of choice

Food choice is a complex process, involving different stages (Ilmonen, 1990). "The most general level is the cultural categories concerning food. The next level consists of some mechanisms materializing these categories. The last level is the actual choice which occurs according to a rational means ends scheme where the relation between incomes, prices and time are the means and the cultural categories and their materialization form the ends." (p. 49).

The cultural categories change very slowly and form a diachronic element in the choice process. The means used in consumer choice conversely belong to the sphere of here and now, to synchronic time. The materialization mechanisms of cultural categories are also related in time in a specific way. Whereas the contour of tradition and the way of life change slowly, style and fashion change quite rapidly. They try to keep up with the times, Ilmonen argues.

Figure 1. Food Choice levels.



Source: Ilmonen, 1990.

Culture loads different food items with meanings and these guide consumer choices. Not only does culture do this but it also creates a framework for supply. There is no point in producing every possible kind of food, because consumers will not buy them. They only buy the items which are culturally acceptable.

The quotidian attitude to food could be called a nourishing one. It is probably our oldest relationship with food and it is still crucial in the choice of everyday food.

The *quotidian* attitude to food is maybe best crystallized in the concept of strength. *Strength* has been attached to food, which is regarded as a source of energy.

Application of the cultural codes, *healthy* and *unhealthy*, to food has never received so much attention as in the 20th century.

Feasts often possess some finesse, refinement or aesthetic element which appeals to our senses and lends "*refinement*" to the experience as such.

Tradition is the oldest of the mechanisms that transforms cultural categories into specific food choices both where content and form are concerned. In tradition-controlled societies the prevailing way of satisfying needs is taken for granted.

Way of life is the theme of everyday life. This theme is naturally limited by financial, social and physical factors, but not determined by them. First the potential - wealth and time resources - must be recognized and secondly there must be a motive to utilize it.

The correlation between the ways of life and classes diminished, whereas the correlation between styles and classes remained high. Since then, the correlation has been so pronounced that it can even be claimed that only stylistic factors define the surface level of a social class, especially its identity. Social distinctions are created, and the main one is taste. The two tendencies, distinction and imitation, explain why there is instability in the content of the cultural categories of valuable and cheap (Ilmonen, 1990).

As fashion promotes novelty, it follows trends and the inarticulate "spirit" of modernity. Fashion may even change the cultural category concerning food, and especially content choice changes dramatically both in quotidian life and feasts.

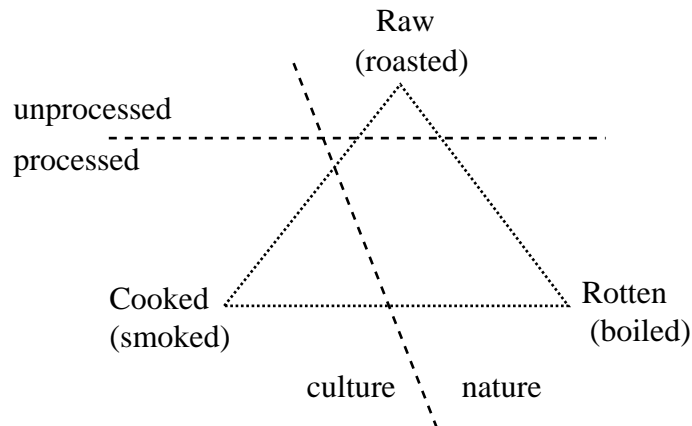
"But when the frame of reference in food choice is clear in households, it serves as an end or, as the economists put it, as a preference order for it. Thereafter, households choose the means to this preference order, that is, they rely on a rational mode of action, on a rational choice." (Ilmonen, 1990, p. 47).

Cultural food patterns

In his famous article "The Culinary Triangle" Lévi-Strauss (1966) creates a triangular semantic, describing raw, cooked and rotted food. The raw food constitutes an unmarked point, opposite the two other points, which are strongly marked. Where cooked food is a cultural transformation of raw food, the rotted food is a natural transformation. In this way we have double opposites between processed/unprocessed and culture/nature, see figure 2. Raw food is only eaten when selected, washed, pared or cut, or even seasoned, whereas cooked food as the

word says, is processed by cooking - i.e. the English phrase for food preparation. Rotting is either controlled, and edible, or spontaneous.

Figure 2. The culinary triangle.



Source: Lévi-Strauss, 1966.

Lévi-Strauss (1966) distinguishes between different cooking methods. Roasted food is exposed to fire, and boiled food is doubly mediated, by the water in which it is immersed, and by the container that holds both the water and the food. Smoked is on the culture side, roasted and boiled on the nature side. This gives rise to a double affinity: roasted with raw, i.e. unprocessed, and boiled with rotted, which is one of the two methods of processing. The arguments are that roasting is a compromise between raw and burned food, whereas rotted meat is decomposed/decayed like cooked food, i.e. boiling is cooking in a receptacle, while roasting is cooking from the outside.

Lévi-Strauss (1966) argues that because boiling fully preserves the meat and its juices, and roasting is accompanied by destruction and loss, the one connotes economy, the other prodigality. Therefore the former is a plebeian, the latter an aristocratic preparation method (p. 590).

Lévi-Strauss claims that the culinary triangle integrates all the important characteristics of a given culinary system, which means that the relevant conditions of a certain society may be filled in to provide an operational framework for analyzing the food system.

However, Douglas (1984) criticizes Lévi-Strauss for over-emphasizing food items. In addition to food items, several other levels of analytical categories should be used, e.g. recipes, diets, meal-cycles, prescriptions for the matching of diets and types of cooking for certain occasions, seasonal foods, and table manners.

"For analyzing the food categories used in a particular family the analysis must start with why those particular categories and not others are employed". "A meal incorporates a number of

contrasts, hot and cold, bland and spiced, liquid and semi-liquid, and various textures. It also incorporates cereals, vegetables, and animal proteins" (p. 66). "We can go much further toward discovering the intensity of meanings and their anchorage in social life by attending to the sequence of meals", (Douglas, 1972, p. 67).

"To sum up, the meaning of a meal is found in a system of repeated analogies. Each meal carries something of the meaning of the other meals; each meal is a structured social event which structures others in its own images." (Douglas, 1972, p. 69).

Douglas (1979) points out that in several cultures, including our own, dog and fox are never eaten, let alone liked. The reason is not that we cannot digest or assimilate fox meat. It is the culture we belong to, the way we tend to see in the universe, (Douglas, 1979). An often quoted example is the rules governing the Jewish meal - the rejection of certain animal species, the draining of blood from meat, meat separated from milk. Which significance do they encode today, partly unmoored as they are from their original social context, if not the meaning of demarcation of a particular and distinctive culture, one may ask.

The differences in the way food is prepared, in the way meals are structured, etc. are a picture of the cultural diversity between countries and differences in living conditions between urban and rural areas, household income, social values and religious persuasion within countries, (Glew, 1990). A certain degree of social commitment is a necessary condition for people to live their lives. This is how they preserve their identity and perceive what is happening as significant.

Lévi-Strauss has one way of distinguishing meal patterns, viz. synchronically or diachronically; where the first indicates that many different dishes are served at the same time, and the second that dishes are served separately in a certain order one after another. Lévi-Strauss views the patterns as typical of traditional or primitive societies, and typical of modern societies, respectively" (Fürst, 1988, p. 92).

However, today style is sometimes more important than the food itself. The mass media set the trends for what we have to eat and how to eat it. Instead of "way of life" Burns (1966) refers to "style of life" in a modern society. But what are the trends? Nickie and Kerr (1988) answered the question after during 1982 and 1983 having interviewed twice two hundred women in the north of England with at least one pre-school child. The provision of a proper meal seems to symbolize the family. Thus, all family members had to be present to consume the meal, and in addition to this it was felt that a proper meal could only be cooked by a woman. The proper meal holds symbolic significance for the continuance of family life. "Through the provision of these meals women are confirmed in their ideologically defined position as homemakers and providers of food for others: their subordinate position in relation to men within the family is reproduced on a daily basis." (p. 227) The gender division of labour therefore defines women as the servers and providers of food within the family, and they serve and provide it for men and for children. "However, although women felt *responsible* for their families' health and felt that the food eaten was important to the maintenance of health, the *control* over the food eaten by the family often lay with men" (p. 230). "Women,

then, cooked proper meals for men and children regularly and liked to give pleasure to them by providing them with food they enjoyed. Indeed, the greatest pleasure in cooking lay in the relish with which it was consumed by others"(p. 230). "The centrality of the proper meal to family eating is therefore a significant constraint limiting the types of changes that can be made to the diet. Food manufacturers are acutely aware of this, convenience foods are all substitutes for elements of the proper meal and where innovation *does* occur it is most frequently in the type of food eaten between meals or at meals other than the proper meal" (p. 237).

The environment

Internationalization of the world for the past two or three decades has changed the use of food radically. According to Pelto and Pelto (1983) an increasing "delocalization" of food production and distribution has taken place. The ".. processes in which food varieties, production methods, and consumption patterns are disseminated throughout the world in an ever-increasing and intensifying network of socio-economic and political inter-dependency. From the point of view of individuals and families at any one place on the globe" (p. 507). This means that an increasing portion of the daily diet comes from distant places usually through commercial channels.

"In the industrialized nations, delocalization has been associated with an increase in the diversity of available foods and the quantity of food imports, and, therefore, with improved diets" (Pelto & Pelto, 1983, p. 507), where ".. in the less industrialized countries of the world, the same processes of delocalization have tended to produce opposite effects on dietary quality, except for the elite." However, "as these populations have been drawn more and more into full commercial participation, economic and political forces have encouraged concentration on one or two main cash crops, with an accompanying deterioration of food diversity, as well as a loss of local control over the distribution system" (p. 508).

"A world-wide dissemination of domesticated plant and animal varieties, the rise of increasingly complex, international food distribution networks, and the growth of food-processing industries, and the migration of people from rural to urban centres, and from one continent to another, on a hitherto unprecedented scale, have the consequence of an exchange of culinary and dietary techniques and preferences" (p. 508-509).

The reason why this may happen is man's status as an omnivorous creature with an invaluable ability to thrive on a multitude of different foods and diets, and thereby to adapt to changes in his environment. Although omnivorousness implies autonomy, freedom, adaptability, this liberty also implies dependence and a constraint - that of variety. An omnivore, unlike specialized eaters, cannot obtain all the nutrients it needs from one kind of food. "These two contradictory characteristics entail equally contradictory consequences; hence the omnivore's paradox. On the one hand, needing variety, the omnivore is inclined towards diversification, innovation, exploration and change, which can be vital to its survival; but on the other hand, it has to be care-full, mistrustful, "conservative" in its eating: any new, unknown food is a potential

danger". "Every omnivore, and man in particular, is subject to a kind of Batesonian double bind between the familiar and the unknown, monotony and change, security and variety" (p. 278).

"A human group's cuisine can, as we shall see, be understood as a body of practices, representations, rules and norms based on classifications, one of whose essential functions is precisely to resolve the omnivore's paradox", (Fischler, 1988, p. 279).

The modern eater has become a "mere consumer":

1. an increasing proportion of the population consumes foods of whose production, history and origin it knows nothing.
2. The work of preparing food is to an increasing extent performed before it arrives in the household and the kitchen.
3. The socio-cultural frameworks which traditionally governed and constrained food have been eroded considerably by economic and technical changes in life style.
4. Modern food is less and less identifiable by its consistency, flavour, smell and texture.
5. Moreover, food technology is becoming increasingly powerful in the sense that it now uses more and more sophisticated processes tending to mask, imitate and transform "natural" or "traditional" products, (Fischler, 1988, p. 289).

Rational choice of foods

The every day choice of foods seems more and more complex even when eating out. At a restaurant we can see the prices of all dishes on the menu, we may have some knowledge of the quality, and we can ask when dinner is ready, and we know in advance that the only thing we have to do is to order the meal, and pay the bill. Nevertheless, very often guests have great problems choosing the right meal, and sometimes question each other about preferences, or simply make a haphazard choice.

However, preparing a meal at home is much more difficult. There is no menu, you have to decide on every detail, and do all the work yourself. The food is only one dish, the alternatives may be excluded. In other words, a home meal is complex and begins long before it is served.

There are five different stages in the process of food production and consumption, viz. production, distribution, preparation, consumption and disposal. At least three of these usually take place in the home, in the kitchen or at the table.

Figure 3. Characteristics of stages of food production and consumption.

Process	Phase	Place
Manufacturing	production	firm
Storing/buying	distribution	market
Preparation	preparation	kitchen
Eating	consumption	table
Cleaning	disposal	kitchen

Source: Goody, 1982, cf. Ekström, 1991.

According to Goody, these arenas are "usually allocated to women rather than men, where the system of division and stratification of domestic and patrimonial labour is made explicit" (Goody, 1982, cf. Ekström, 1991).

The mothers' task is to provide their families with good, nourishing and cheap food, and at the same time prepare food that everyone in the family will like and eat (Ekström, 1990). "Most of the housework is done by the housewife. This particularly applies to dinner preparation, other cooking and planning the shopping", (Wold, 1985).

Table 1. Division of labour in two parent families.

(N:292)	Planning	Shopping	Breakfast	Dinner
	-per cent -			
Mother alone or most part	78	65	24	59
Together	8	16	24	29
Father alone or most part	3	7	13	2

Source: Ekström, 1991, p. 94.

Even though the precise form taken by gender and age divisions may depend on class, gender and age divisions persist throughout the class structure. Women are subordinate to men, and children are subordinate to adults. These social relations of power are reflected in every aspect of family eating that we have explored. Food practices within the family, therefore, reflect and reproduce social divisions of gender, age and class and, because of this, contribute to the maintenance of the social order - a social order characterized by inequalities between women and men, adults and children and different social classes, according to Charles and Kerr (1988).

Consequently, the division of labour represents a certain social order, where rationality is not appropriate. The neoclassical economic theory explains the division of labour by differences in human capital, but not why the division of labour may change in the long run, or more precisely, why the structure of preferences is not stable.

Ekström (1990) discusses other dimensions involved in food preparation, like the organization of meals, methods used for food preparation, and dishes served at meals.

E.g. on weekdays we move away from traditional food, but this primarily applies to the preparation of food. On weekends we do the opposite. It seems that we make up for the rest of the week by doing some "real home cooking" in the traditional manner using raw materials, (Fürst, 1988, p. 94).

"The difference between weekdays and weekends illustrates the way in which work has changed and developed in modern societies", (Fürst, 1988, p. 94).

This may be due to a rational or an irrational choice. Nevertheless, the way in which people spend their disposable money and time is only one element in a chain of decisions, revealing a mode of organizing their lives, and one of the concrete forms in which the social structure is visible.

In a Swedish ethnological study the factors determining our choice of foods and the organization in households are analyzed (Jansson, 1988). The most important finding is that individualization of the meal caused by a tightening of the social community and lack of social standards is a myth. However, lunch has its own rules - simple food, individualization, limited requirement for social life -, which may depict the general development in the society, but this is not the case for dinner. Staggered working hours and fixed opening hours in child care centres make it difficult to eat together at fixed hours every day. Therefore meal times change during the week in order to gather the whole family. At meals socialization takes place, not because it is practical, but because standards dictate it. "Dinner is a time for the whole family to sit down together. About 6 of 7 meals are eaten together with the rest of the household", (Wold, 1985).

The myth of individualization may be the result of more people living alone - sequential monogamy - and therefore it seems like a process towards individual eating, (Jansson, 1988).

Another finding is that most time-poor families are very time-extensive in shopping and food-preparation activities. It seems that shopping becomes frequent, often the family-shopping is a routine task, without a shopping list, making decisions, when prices and supply are revealed at the outlet. Opening hours, long distances to shopping centres, etc. may also explain the frequent shopping without planning, which is an important characteristic of busy families (Jansson, 1988).

An increasing market for discount goods indicates that rational choice has become a daily phenomenon. The question is, however, whether discount prices mean buying the same goods cheaper, or buying other goods than the usual ones, because of lower prices. In other words do we save money without changing the content of the shopping basket, and do discount markets affect buying habits. Jansson (1988) claims that mostly we buy the same goods cheaper because of conservative preferences and shopping behaviour.

The same questions could be asked about nutrition recommendations. Do we heed these recommendations or are the habits and standards so strong that our usual behaviour is unchanged. It could be argued that the increasing emergence of malnutrition caused by over-eating is an indication of the last answer. Wardle (1977) says, "Although food habits have evolved they remain, even to-day, peculiarly resistant to change. Part of the reason for this may be found by examining the various functions food serves. Biological, physiological, social and emotional", and it should be added that rational choice is only one parameter in the choice of foods.

Nevertheless, "The discrepancy between the income elasticity of expenditure of a given food and the corresponding income elasticity of quantity purchased indicate that as incomes rise, consumers tend to purchase higher quality food." (Wardle, 1977, p. 37), "With the growth in affluence, more and more consumers came to see food as a source of pleasure as well as a source of nourishment."

The choice of foods and the scientific disciplines - a summary

The discussion above represents different scientific approaches, which to some extent compete but in other ways support each other. This discussion will not be taken up here, but in accordance with Holm (1991) the approaches are classified in four different groups, viz.

1. the *sociological approach* - where changes in nutrition or food behaviour in general are due to learning processes. People are exposed to certain actions from society, thus standards and habits are the ruling determinants.
2. the *cultural analyses* - where food and table manners are solidly tied to a particular time and culture. The barriers of change are important.
3. *rational behaviour* - economic factors may change eating habits. Food habits may be changed like habits in all other consumer areas.
4. *historical analyses* - more levels of analyses at the same time. Food is part of production in society, in the organization of everyday life, i.e. everyday culture, and in the subjective world. Changing food habits may be perceived as coincidence and correlation of transformations at several levels at the same time, cf. the theory of Ziehe (Holm, 1991).

3. General theory

In the neoclassical theory of consumer behaviour, utility is a crucial concept assuming that consumers attempt to attain the highest possible level of welfare by maximizing utility, U , derived from market goods and services.

Formulated more strictly, we have a utility function

$$(1.1) U = u(x_1, x_2, \dots, x_n)$$

and a budget restriction

$$(1.2) I = \sum_{i=1}^n x_i p_i,$$

where I is nominal (money) income and p_i the nominal (money) price of the good x_i . This means that the effect of a change in real income and/or in relative prices for the demand of x_i may be described in the demand function

$$(1.3) x_i = d(I/p, p_i/p, TA),$$

in which p is a price index and TA is taste. Income, prices and taste combined explain consumer behaviour, (Becker & Michael, 1973).

In empirical research work grouped data are often utilized to reduce problems of measurement and the like of independent variables, and because aggregate results are preferable to non-aggregate ones at the individual level. Another argument is that income and prices merely explain a minor part of the variation in the demand for specific goods and services. Grouping the data by independent variables simply improves the estimation results, (Cramer, 1971; Becker & Michael, 1973).

However, a classification by family size, age, education, etc. may only become a "proxy" of the taste by showing the systematic effect of such variables on consumer behaviour. It will not render superfluous the taste, TA , as an explanatory factor, (Becker & Michael, 1973). Becker and Michael also criticize consumer theory for being formulated in monetary prices and monetary income, by which utility only becomes a function of market goods and market services. Decisions about allocation of consumer non-market time and decisions about choice of religion, marital status, family size, divorce, political affiliation and life style are also topics of the allocation of scarce resources, without being a part of traditional consumer theory.

In "A Theory of the Allocation of Time" (Becker, 1965), time became an explicit parameter in consumer theory. Beside the allocation of income between different goods and services, the household allocates time to different activities to maximize utility. Consumption influences the time spent on the labour market and thereby the income, just as income influences consumption and thereby the allocation of time. In this way the theory is applied on labour market theories, (Jacoby et al., 1976).

According to Becker's theory, households produce so-called Z-goods - commodities - by the use of goods and services from the market, and time. The implication is that all market goods and services become input in household production, and thereby the demand for these goods and services is derived from the demand of Z-goods. The classic example is going to the theatre, which requires the consumption of player services, building capital, etc., and time spent by the audience.

The formal description of commodities is

$$(1.4) Z_i = f_i(x_i, T_i),$$

where x_i is a vector of market goods and T_i is a vector of time inputs utilized to produce the i 'th commodity. For durables x is return of capital.

To obtain the highest possible level of welfare the household chooses the best combination of Z-goods - "productive consumption" - by maximizing the utility function

$$(1.5) U=U(Z_1, \dots, Z_m)=U(f_1, \dots, f_m)=U(x_1, \dots, x_m, T_1, \dots, T_m)$$

considering the production function (1.4), the restriction of disposable time in the household

$$(1.6) T=t_w+\sum_{i=1}^m t_i,$$

and an income restriction

$$(1.7) I=\sum_{i=1}^m p_i x_i,$$

where t_w is the household's working hours on the labour market, and t_i , p_i and x_i are time, price and the amount of input of market goods, respectively, to produce Z_i .

Combining the time restriction and the income restriction we have a restriction of the economic resources in the household, i.e. "full income", S ,

$$(1.8) S=wT+V=\sum_{i=1}^m (wt_i+p_i x_i),$$

in which w is the wage rate, which is assumed to be constant, and V is other non-wage incomes. The advantage of this concept is that simultaneously it contains a time restriction and an income restriction, as well as the income which in this way becomes independent of the allocation of time between different income yielding activities.

Maximizing the utility function (1.5) subject to the production function (1.4) and the full income equation (1.8) may be formulated as an optimization of a Lagrange function

$$(1.9) L=U(Z_1, Z_2, \dots, Z_m)-\sum_{i=1}^m (wT_i+p_i x_i)-S,$$

where the 1. order condition implies that

$$(1.10) MU_i/MU_j = \frac{p_i * dx_i/dZ_i + w * dT_i/dZ_i}{p_j * dx_j/dZ_j + w * dT_j/dZ_j} = MC_i/MC_j$$

where MU_i and MU_j denotes the marginal utility of the two Z-goods, and MC_i and MC_j the marginal costs, respectively.

In other words the relationship between the marginal utilities of the two Z-goods equals their marginal costs, which is also the case for ordinary market goods. The difference is that the

marginal costs are shadow prices for Z_i , which are determined by the prices of market goods and time, and their productivity in the production of Z_i .

The inclusion of production in the theory of consumption implies that the household minimizing the production costs and maximizing the utility responds to changes in prices, productivity, relative shadow prices, and changes in full income. As an example, a lower price of one of the production factors switches the production process towards a technique, which intensifies the use of that factor, and towards goods, which intensify the use of the factor comparatively. According to the theory a more pronounced use of the factor is correlated positively with the size of the production and consumption substitution elasticity. At the same time a change in the price of a factor affects the relative factor prices more than the relative commodity prices. If this is not counterbalanced by differences in substitution, factors employed in producing the same commodity have higher cross price elasticities than factors employed in producing different commodities.

Furthermore, the operation of household production functions implies that the demand of some goods may be considered as a composite demand. Fuel is both for heating and food preparation, and therefore the elasticity of demand is combined in accordance with the different functions. This means that goods may be grouped in accordance with their purpose, i.e. in families of consumer demand functions, where income elasticity is the criteria of separation. Muth (1966) operates with another concept of separability, by which the marginal rate of substitution on such goods is assumed to become functionally independent of the amount of other goods.

According to Lancaster (1966) the demand for a certain commodity is correlated with the characteristics of that commodity. Therefore the utility is not derived from the commodity itself but from its characteristics. Further, Lancaster assumes that a commodity may contain several characteristics, that many characteristics may be found in different goods, and that a combination of goods may contain more characteristics, which are different from the characteristics of the individual commodities. Finally, Lancaster postulates that the characteristics of equal amounts of a commodity or a combination of goods are identical for all consumers. This means that consumers must choose between a couple of characteristics, and not like in the usual theory of consumption, to allocate characteristics to the goods.

In the Lancaster model the correlation between the level of activity k , y_k , and the goods consumed in that activity is assumed to be linear and objective

$$(1.11) \quad x_j = \sum_{k=1} a_{jk} y_k,$$

in which x_j is the j 'th good and a_{jk} a vector of goods. Every consumption activity in the model produces a fixed vector of characteristics, and it is assumed that also this relationship is linear, which implies a correlation between the amount of characteristics, Z_i , and the level of activity, y_k , formulated as

$$(1.12) \quad Z_i = \sum_{k=1} b_{ik} y_k,$$

where the coefficient b_{ik} can be objectively determined for arbitrary choices of z_i units. Another assumption is that the consumer has an ordinal utility function of characteristics, $U(z)$, and attempts to maximize the utility with the help of these.

In other words we have a relationship between the assortment of characteristics, the vector z , which are applicable to the consumer and part of the consumer's preferences, and the assortment of goods, the vector x , which represents the link to the rest of the economy. As opposed to traditional consumer theory this correlation is not one to one and direct, but indirect through the activity vector y . When comparing characteristics, this among other things implies that the substitution effect in a complex economy with many goods is either apparent by changing relative prices combining goods unsuited to fulfil a certain combination of characteristics, which is why the combination is substituted by something else, or it is apparent by changing relative prices altering the combination of characteristics in accordance with the consumer's structure of preferences, i.e. the effect of substitution in traditional consumer theory.

One of the advantages of the Lancaster theory is, therefore, that different goods entering commodities have different substitution effects contrary to ordinary consumer theory, where there is no relationship between the goods.

The theories of Lancaster, Muth and Becker are similar in the way that they all let the demand for final goods, Z-goods and commodities, become functions of the shadow-prices, which furthermore are functions of the prices of the goods and the household technology involved. Pollak and Wachter (1975), however, claim that many goods are input to several commodities, e.g. the car as an input to commuting and leisure tours, along with the fact that some activities are simultaneous, e.g. food preparation and child-minding. This kind of joint production implies that the advantages of utility maximization in some way have to be distributed to the individual Z-goods. Furthermore Pollak and Wachter illustrate how shadow prices are independent of the composition of the Z-good bundle, household technology, and of household preferences. Therefore there is no constant return to scale. Finally households are assumed to have preferences as regards time use in terms of the highest direct utility. Consequently the allocation of time expresses the preferences for different activities. According to Pollak and Wachter joint production and non-constant return to scale imply that implicit prices have to be abandoned and the demand for Z-goods be analyzed on the basis of commodity prices, wages, and other income.

The above consumer theories are criticized for excluding household technology, and Lancaster is criticized for only analyzing consumption technology. Gronau (1973) suggests that the practical problems separating household work and leisure have to be defeated, and that a separation is required because of different reactions to changes in socio-economic variables, and because relative prices are not constant and therefore influence the production and the outlet prices differently. As an example higher education for women entails a substitution of household work by working hours on the labour market, if leisure time is constant. And data from the USA illustrate that higher wage rates for women reduce time for household work and leisure, and increase women's working hours on the labour market. However, a higher wage

rate for the woman has no effect on the husband's working hours, but increases his household work and decreases his leisure time. An increase in men's wage rate also increases their working hours, while wives' working hours decrease. However, this has no effect on women's household work, which entails an increase in their leisure time. In other words the cross-time elasticities are different according to whether the husbands' or the wives' wage rates increase. Higher non-wage incomes decrease working hours on the labour market and in the household for men as well as for women, leaving more leisure time for both spouses. Consequently the decisive factors influencing changes and differences in time allocation are changes in wage and non-wage income and socio-economic variables such as couples/singles, the number of children, status on the labour market and sex.

Gronau sets up a model to explain these relationships including the supply of labour to the labour market, women's contribution to economic welfare and consumption - especially the demand for household production substitutes -, assuming that there are no preferences in consuming goods and services from the market compared to goods and services produced in the household. This implies that household work and work on the labour market are close substitutes containing equal direct utility. In this way the consumer maximizes the amount of Z-goods, which is a combination of goods and services (X) and consumption time (T_L),

$$(1.13) Z=Z(X,T_L),$$

where the goods and services are either bought on the market or produced at home, and the composition is without any effect on Z. Therefore X contains X_M - market goods - and X_H , which is produced at home by the input of household work, T_H ,

$$(1.14) X_H=f(T_H)$$

assuming declining marginal productivity.

Beside an income restriction

$$(1.15) X_M=WT_W + V,$$

where W is (constant) wage rate, T_W working hours and V non-wage income, we have an overall time restriction $T_L+T_H+T_W=T$. Optimally the marginal productivity of household work equals the marginal rate of substitution between goods and consumption time, which again is equal to the shadow price of time, W^* , (Bonke, 1992).

The advantage of the Gronau model is that households may choose commodity-intensive technology and still be "home-intensive" because of a considerable household production. If marginal productivity in the household production, however, is smaller than the real wage rate, there is no household production, only work on the labour market and leisure time, cf. Becker.

According to Gronau a higher non-wage income may be explained as a pure income effect,

which does not influence marginal productivity in household production. The relationship between the price of market goods and household production is therefore the same, and commodity-intensive consumption technology is possible without increasing household production, assuming the pure income effect implies more leisure time at the expense of working hours on the labour market. In contrast, if there is no work on the labour market, then higher non-wage income decreases household work, and increases consumption/leisure time.

A higher wage rate implies a lower commodity price per time unit and thereby renders household production less profitable. Household production is diminished, while the effect on leisure time cannot be predicted, the substitution effect decreases and the income effect increases leisure time. However, the income effect seems to be higher the more hours are spent on the labour market. For men these effects are equal, because most men work full time, but for women the substitution effect is greater than the income effect, which means that an increase in women's wage rates increases their supply of labour, *ceteris paribus*.

The theory of terms of trade - household production and market substitutes

The above neoclassical models distinguish between work on the labour market and household work with the aim of explaining the optimum allocation of time between these activities. The implication is that the substitution of ordinary household production by household production done by hired labour, servants etc., is excluded and consequently the impact on the optimum allocation of time.

In a model developed by Quah (1986) all substitutes are included and the correlations illustrated in a four quadrant frame work, see figure 4. In (c) we find the feasible substitution between time on the labour market and time in household production, assuming leisure time is constant. In (b) we see a declining scale of return of working hours on the labour market because some members of the household are assumed to be more productive in household production than on the labour market, i.e. the income production. Therefore, members that are less market productive with a higher participation in this production means a lower overall productivity compared to the situation, where they participate less. This is the same in household production, where we also assume varying productivity for the members of the household, cf. (d).

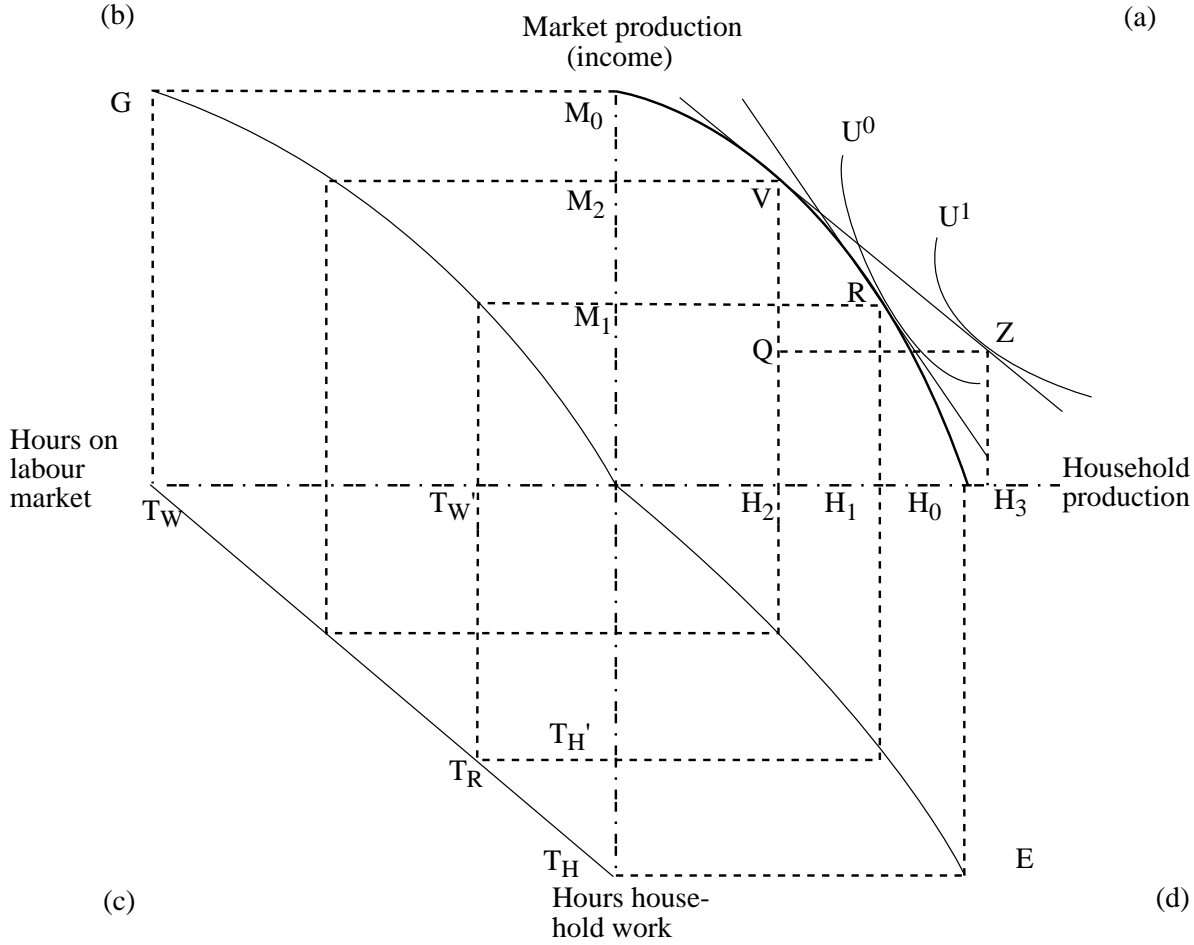
Figure (a) describes the potential production curve, M_0H_0 , the maximum income and household production, which is available by varying time allocation. When measuring both productions in terms of time use, taking into account a declining productivity, we have M_0 (T_WG in (b)) as the maximum income, obtained by working on the labour market only, and similarly H_0 ($T_H E$ (d)) as the maximum household production obtainable by only working at home. The other points on the curve tell us that working on the labour market is combined with working at home, and in point R, where the potential production curve and the indifference curve, U, are tangent to each other, utility is maximized by an income and a household production at M_1 and H_1 , respectively, and working hours in the two productions at T_W' and T_H' . The tangent indicates the exchange rate between the two activities, i.e. the shadow price of household work expressed as the opportunity wage rate.

Assuming a possible substitution by household servants, who are willing to do household work below the shadow price, the household will gain financially by letting the servant do the job. This means a reduction in ones own household work and an increase in the supply of labour to the labour market, assuming that the leisure time is the same. We move from R on the potential production curve to V, where further substitution between ones own household work and that of others is no longer financially profitable.

At point V the exchange rate between working out and working at home is similar to the price for servants, and we produce M_2 income and H_2 household production. However, the exchange rate allows for more utility U^1-U^0 by reducing household production to H_2 and letting the servant produce H_2H_3 . The price for increased utility is the income VQ .

The consequence of lower prices on market substitutes compared to the exchange rate, the disposable income per working hour in household production, is the existence of new optimum distribution between household work and work on the labour market as compared to the one found in traditional neo-classical models. And if the theory of declining marginal productivity in market production as well as in household production is abandoned, a lower price on market substitutes than that offered by the exchange rate, implies that market substitutes will take over the whole household production, and the household will only work on the labour market.

Figure 4. Time allocation, household production and market substitutes.



4. Household production - time-saving and time-buying strategies

During recent decades women's participation in the labour market has increased significantly. In the 1960s and 1970s we saw a movement of non-employed women becoming part-time workers, and nowadays the movement goes towards full-time positions on the labour market. For men the full-time working status has been permanent, and the only flexibility is caused by overtime and/or second jobs. Labour market bargainings, however, have among other things brought about reductions in working hours for wage earners, which mostly means men, who in this way have gained more disposable time. Nevertheless, these reductions have not counterbalanced the rise in women's working hours - a higher participation rate and increased working hours -, and consequently there has been a more pronounced time pressure in most families.

According to the theory, this should give rise to reductions in household work, as well as an altered allocation of time between its members, i.e. another intra-familiar allocation of time. In theory one household member's time in non-market labour is exchangeable with another's, subject to the effect of differential wage rates and opportunity costs of earlier earnings. (Becker, 1965).

Firstly, we find a decreasing household production, which means that there is some trade-off between this kind of work and work on the labour market. Secondly, we also find some changed allocation of time among household members. Men do not work fewer hours on the labour market, when women increase their working hours, but nevertheless men's household production is to some extent increased, while women diminish their household production, i.e. that the total household production decreases. However, women's trade-off between working at home and working out is not large enough to ensure an unaltered work load, and we find that the work load of women as well as that of men increases, when women become full-time wage earners.

In double-career families with both spouses working full-time, the work load, the working hours on the labour market added to the hours in the household production, amount to 16.7 hours daily (average weekday) compared to 14.3 and 12.7 hours in families, where the woman works part time on the labour market or not at all, respectively, (Bonke, 1989).

The question is how households have sustained or enlarged the level of economic welfare, when it has more money and spends less time in household production. To what extent do they substitute home made goods with market goods and services, and to what extent do they enlarge productivity in their household production. Which kinds of time-saving and time-buying strategies are available to the households to fulfil the needs for food and services?

In order to answer these questions, we will describe, what we understand by producing and consuming foods/meals, i.e. the chain of meal activities. Secondly various strategies are characterized, and finally some results of other research work in this field are presented.

Chain of meal-activities

Preparing a meal requires a lot of different (sub-)activities.

First of all the meal has to be planned and the decision made on how to arrange the meal. This requires some time, often in joint production with other activities, and experience as a determinant of productivity. The purchase of "altogether" convenient foods and a calculator will for some rationalize planning.

The next activity is shopping, where the components are transportation to and from the place of sale, and the shopping itself. Like the planning/organizing activity there may also be joint production in transportation, viz. where it is part of commuting. Also the means of transportation may increase the productivity, and so does buying price-intensive goods, i.e. high price per weight, allowing fewer trips, *ceteris paribus*.

The availability of home-storage facilities determines the rate of industrial preparation acceptable for foods. Perishable foods can only be bought in small quantities, unless one has a refrigerator, just as frozen foods require storage in a freezer to keep fresh for later preparation. In other words different storing strategies can be chosen with varying consequences for the amount of time to be spent on shopping, and (maybe also) on the meal preparation.

Obviously, the preparation time is determined by the rate of convenience of the foods and the kind of appliances available. It is assumed that microwave ovens, food-processors etc. all increase productivity in food preparation.

Finally, washing up and cleaning up are less time consuming when using a dishwasher, not to mention disposable plates. This intensifies productivity in these links in the meal-activities chain.

Of course the consumer/producer may to some extent choose more or less time-intensive strategies in the various sub-activities. As an example many pensioners spend a lot of time shopping, and buy highly preparation-convenient foods. However, a coherent structure in the consumer's chain of meal-activities is taken for granted, which means that it is either time-intensive or time-extensive in some way, with some variants in between.

Figure 5. Chain of meal-activities, and kinds of goods characteristic and technology.

Goods characteristics	Activity	Technology
Non-convenient/convenient	Planning/organizing	Calculator
Price-intensive/price-extensive (price/weight)	Shopping/transportation	Means of transportation, car
Perishable/non-perishable	Storing	Refrigerator, freezer
Non-convenient/convenient	Meal preparation	Oven, microwave, food processor
Perishable/non-perishable	Storing	Refrigerator, freezer
Throw-away/semi-durable	Washing up	Dishwasher
Non-convenient/convenient	Cleaning up	

Time-intensive strategies

There are several strategies and combinations of strategies to intensify time use in meal preparation, and thereby reduce time pressure in the households.

The household may:

1. Substitute capital equipment for their own non-market labour, holding constant total quantity and quality of household production.
2. Substitute convenient goods for non-convenient goods reducing their own non-market labour, holding constant total quantity and quality of household production.
3. Reduce the quantity of household production by buying full substitutes.
4. Substitute the labour of paid help for their own non-market labour, holding constant total quantity and quality of household production.
5. Use own labour more intensively or efficiently when engaging in household production.

And the home makers may:

6. Substitute the labour of husband and/or children for their own non-market labour, holding constant total quantity and quality of household production.

The first four strategies may be labelled "time buying" strategies because time is bought for money. The fifth strategy is "time saving" by increasing productivity, and the last strategy is also "time saving" from the home maker's point of view. That is what Nickols and Fox (1983) call intra-familial strategy to save time.

Time buying strategy - durables:

Household investments in capital equipment have been the topic for various theoretical considerations.

According to Galbraith (1973) the wife's employment, holding the family income constant, means fewer investments in durable goods relative to income - the DUR/Y-ratio -, than households where only the husband goes out to work. The reason is that durables require labour-intensive administration, for which working wives have neither the time nor the interest. In contrast to this, Mincer (1960) says that two-income families invest more money in these appliances than one-income families do, because durable goods are a kind of investment. The income earned by the wife is considered transitory opposite to that of the man, which is "permanent" income, and the marginal propensity to save out of transitory income is higher than the propensity to save out of permanent income, Mincer assumes. Therefore, families in which the wife goes out to work, spend more money on capital equipment.

These opposing views have been criticized by Strober (1977), who claims that administration and management of capital equipment may not counterbalance the time saved following investments in durable goods. Buying capital equipment is a strategy to increase the time intensity in household production, therefore Galbraith's conclusion is not valid. On the other hand, women's income cannot just be perceived as transitory, is Strober's comment on Mincer's assumption.

A better explanation of the relationship between the labour supply of the wife and the consumption in the family is, according to Strober, to perceive women's income as the one that fills the gap between the differences in the need for consumption and the income in the life cycle. Most families have a reference group of consumers, the same age, educational level, geography etc., with which they compare themselves, and when the gap widens significantly, the income is regulated by the wife's labour supply. In this way the income earned by the wife is dependent on the husband's income. In families where the wife has a low wage alternative, the gap will not get levelled out, however, because of the better opportunities in household production, and the same in families with a high wage alternative for the wife, for whom Strober anticipates only a minor dependency of the man's income in levelling out the gap between the need for consumption and income. In most families the wife's labour supply

has managed to secure an income level equal to that of the reference group, Strober claims.

In two-income families the income will be spent, among other things, on durable goods, and the DUR/Y-relation becomes parallel to that of families on the same income level. A higher DUR/Y-relation will only appear in families, where the wife recently entered the labour market, but very soon these families will be like the others, and further time-saving will be gained by buying more convenient goods and services.

By multiple regressions Strober (1977) confirms that for different life-cycle groups, one-income families have the same DUR/Y-relations as two-income families. Anderson (1971), Foster, Abdel-Ghany and Ferguson (1981) and Strober and Weinberg (1977; 1980) have the same findings in the wife's employment and the expenditure for durables, DUR, adjusting for various factors. This implies that families do not treat wives' and husbands' earnings differently. Income earned by wives are not considered to be "transitory".

According to Reilly (1982) there may, however, be some correlation between labour supply and expenditure on durables, because women who do much overtime - role-overload - possess more time-saving durables than women with less overtime. Also the status on the labour market is essential in explaining ownership of durables, see Schaninger and Allen (1981). Adjusting for different income, high status and low status means relatively more capital equipment, than in families where the wife is non-employed.

However, most households have basic appliances, such as an oven, a refrigerator and a freezer, and these investments tend to be non-recurring (Strober, 1977), which does not point to any significant correlation between these and expenditure for foods in general. One exception is dishwashers, which are now owned by 27 per cent of all Danish households. We assume that the ownership of such appliances may be perceived as a strategic variable expressing the choice of a certain time-buying strategy. Just as having a microwave oven, which is the case for 18 per cent of Danish households, and/or a food-processor, offers the possibility to buy a broader selection of foods with varying preparation rates.

Time buying strategy - non-durables:

Substituting convenient goods for non-convenient ones reduces the preparation time of meals in the household, and hence becomes a time buying strategy.

However, similar to investments in durables, Douglas (1976) finds no correlation between the employment rate of the wife and the buying of convenient goods. One-income families buy as many of these goods as do two-income families. What is significant is the wife's education, see also Redman's (1980) positive findings, the family income and the husband's occupation, for which there are correlations to the expenditure for convenient product services. Dickins (1958) and Schaninger and Allen (1981) found that also the wife's occupation was important in the way that wives in low status jobs buy more convenient goods than wives in high status jobs.

According to Reilly (1982) there is no significant correlation between role overload and the buying of convenient goods, in spite of the fact that the correlation between the buying of such goods and the ownership of durables is negative, and the correlation between durables and role overload is positive and significant.

Like the negative correlation between the buying of convenient goods and durables, Redman (1980) finds an indirect correlation between convenient goods and services, away-from-home-meals, in the way that with the wife's age the demand for convenient goods increases, and decreases for services. Redman and other scholars do not offer a view as to whether this is due to a generation effect or an age effect, though this should prove an interesting issue for analysis.

Time buying strategy - services:

For many double-career families the opportunity cost of time is too high to prepare everyday meals themselves, which is why the time buying strategies of buying durables and/or convenient goods become insufficient. They buy services in the shape of hired help, servants, (see below) and/or buy meals-away-from home to have time-intensive and money-extensive meals.

In a cross-sectional analysis Waldman and Jacobs (1978), Vickery (1979) and Bonke (1988) confirm that there is a positive correlation between the demand for time-saving services, meals-away-from home, and the employment rate of women, also when adjustments for different incomes are made, i.e. double-career families may earn more than single-career families. However, the difference is only significant when comparing part-time working wives with full-time working wives in families where the husband works full-time. There is no significant difference between non-working wives' families and part-time working wives' families (Bonke, 1988).

The relationship between the income and the purchasing of time-saving services is confirmed by Bellante and Foster (1984), and Prochasha and Schrimper (1973), who demonstrate a positive correlation between the opportunity cost of time and the expenditure for Away-From-Home-Food. Bonke (1988) estimated the elasticity of income for this kind of food, and found the largest elasticity in families, where the wife works full-time. In this case, the demand is elastic, which means that expenditure for food-away-from home, constitutes an increasing portion of the budget, when the income increases.

An analytical problem, however, is that not all families eat out, at least not in the rather short period of time when the analysis takes place. To adjust for this sample selection bias, Lee and Brown (1986) performed a two-step procedure (tobit-)analysis, by first estimating the probability for eating out, and then observing the correlation between the income and the expenditures of families eating out. In the first case they found a positive correlation, saying that the income increases the probability for eating out, but in the second case they found no correlation for families eating out between eating out and the income, except for very high income

families, where the correlation was positive.

In most analyses, expenditure is the depending variable. However, Prochasha and Schrimper (1973) employed the *number* of meals-away-from home as a dependent variable, and found that the income elasticity arrived at was lower than the income elasticity of expenditure. The explanation given is the desire for higher quality, higher prices for meals out in higher income families as compared to lower income families.

Nickols and Fox (1983) divide the Away-From-Home meals into meals in snack bars and meals in restaurants. For the first category there is a significant difference between the number of meals of non-employed wives' families with two children and those of similar, employed wives' families. This is not the case for meals in restaurants, where they found no significant difference.

Finally small children explain the demand for eating-out meals, Bellante and Foster (1984) found. In this type of family there is a lower demand for away-from-home meals, but at the same time they demand more professional childcare and hired help. They substitute one kind of services with other kinds.

Time buying strategy - hired help:

Earlier, paid domestic help was considerably more common in many families. Several household tasks were performed in this way on a more or less permanent basis, because the exchange rate between the husband's wage rate and that of the servant made it stand to reason to hire professional help, in spite of the fact that there was no substitution between the husband and the servant in practice. However, an increasing employment rate for women partly created by - and in itself creating - a rising income level means that the exchange rate is not favourable enough to substitute the wife's household work by paid household help, see Quah (1986). The higher financial equality, the less hired help, it appears. Gershuny (1983) illustrates this by showing that for decades, only wives in working-class families reduced their household working hours, while wives in middle-class families increased their time spent on housekeeping. The reason is that the latter category could not afford to hire help anymore, as their opportunity cost of time increased. The wage relations were equalized, and a "servant problem paradox" occurred, according to Gershuny.

An exception is child-minding, where double-career families have to pay day care centres or private minders for their services.

Nowadays, however, many young school girls have increased their consumption, which means that they increase their supply of labour very often in non-declared (moonlight) household jobs. They shop, clean, and perform other unprofessional tasks, whereas meal preparation and the like, is still performed by the wife, because of the husband's preferences for high quality in the product of this activity.

Time saving strategy - productivity:

The fifth strategy entails that the employed wife decreases the time in household work, and at the same becomes more efficient.

The first phenomenon is confirmed in various studies of time use in household production, see Robinson, 1977; Walker and Woods, 1976; Bonke, 1989, and Körmendi, 1990. The trade-off, however, is not sufficient to ensure a reduction of the overall working hours, though full-time working women become role-overloaded compared to their full-time working husbands. This is the finding in Strober and Weinberg (1980) and in Bonke (1989), who among others hold the income and the life cycle stage constant.

The correlation between quality and quantity of household production and time used in the production is much more difficult to measure and no detailed empirical research work seems to have been done in this field. In the much quoted article "time spent in housework" Vanek (1974) claims that Parkinson's law is in operation, which means that time pressure increases productivity, and so does the wife's role as a good mother and housekeeper, cf. the role theory by Parsons and Bales (1955).

Time saving strategy - other household members:

The last strategy to be mentioned is intra-marginal substitution, where the wife's household work is taken over by the husband and/or the children.

Bonke (1989) found a significant and positive trade-off between the supply of labour to the labour market of the wife and the husband's household work. Separating the increasing labour supply into the movement from non-employment to employment, and from part-time to full-time work, Bonke only found the trade-off in the last case. This means that a higher part-time employment rate, which was the case in the 60s and the 70s, decreases the wife's household work, but does not affect the household work of the husband, whereas a wife's part-time job being replaced by a full-time job entails a small reduction in her household work and an immense increase in the husband's household work. In both cases Bonke adjusts various distributions in the life-cycle stages.

Whether there is a trade-off between the wife's labour supply and that of the husband, and between the children's household work and the wife's labour supply, has unfortunately not been established in the above research work or from other empirical studies.

What has been shown is that there are various strategies to achieve time-saving in household work, and that families choose one or more of these strategies depending on the wife's employment rate, education, stage in the life cycle, etc. The cultural background may also influence the consumption pattern, as a following report containing comparative analyses between different countries will attempt to demonstrate.

5. Methodology

For the empirical analysis data from the Expenditure Survey of the year 1987 (Danmarks Statistik, 1992) as well as data from the Time Budget Survey of the same year (Danish Institute of Social Research, see Andersen, 1987) were used.

The households in the Expenditure Survey, with permanent residence in the same home, partaking in common meals, and spending their income for the common good of the household, kept account of all expenditure for two weeks in 1987. These periods were randomly distributed over the whole year. A deflation procedure was subsequently carried out by Danmarks Statistik to resolve the problem of the varying price-levels of 1987, and afterwards consumption was multiplied by 24 to compute the yearly consumption per household. Less frequent expenditures and the purchase of consumer durables during the whole year and some socio-economic data were also reported in the survey.

The various expenditures were reported in market prices, including VAT and taxes, at the time of purchase, not the time of payment. Sale of second hand durables was put down as negative consumption.

The study sample included couples in which the husband worked full-time, 35 hours or more per week, for at least 48 weeks of the survey year. Single men also worked full time, while single women worked full-time or part-time, which means 15 hours or more per week, for at least 48 weeks of the survey year. No adults were under education. Families with more than two adults were excluded, because of the potential for more than one food regime, see below, in the same family. This means that children above 18 living at home and their parents did not take part in this study. Families who did not report employment level, family income, wife's education, the number of children and age of youngest child, and the ownership of certain appliances were also excluded. These adjustments resulted in a study sample of 1395 families.

The Time Budget Survey covers a survey period of the whole year, where individuals answered a number of frequency questions, and recorded their activities in a diary telling how they spent their time down to a quarter of an hour. This survey was used for background information to estimate the correlation in the food-chain, see below, and the disposable time specified as 24 hours minus working hours including transportation as well as time used for personal care and child-minding.

In the statistical analysis it was examined to which extent households chose diets in accordance with their economic resources: time, money and human and real capital. This means the correlation between various food regimes consisting of foods classified by the preparation time-intensity and expenditure-intensity, respectively, and some socio-economic characteristics of the households were investigated.

Food regimes

In figure 5 above, the chain of meal-activities was illustrated and it was shown how the links follow each other in a certain order, but not necessarily one right after the other or with the same frequency. Shopping can be done a few times a week, cleaning up once a day etc., while meal-preparation in general has to be made just before eating. Beside joint production in some of the sub-activities, there is a variable use of time. Time-intensive sub-activities can be replaced by expenditure-intensive ones in the same food-chain, and the production method can still be rational optimizing household utility.

Whereas shopping in average takes about 19 minutes on a weekday, meal-preparation takes 33 minutes, and cleaning up/washing up another 16 minutes. Either of the correlations between these food-chain sub-activities are the same. In table 2 it can be seen that the correlation between meal-preparation and cleaning up/washing up is rather high at the individual level, i.e. the individual member of the household is the analytical unit in the time budget survey, which means that there is no information about intra-familiar time-allocation. However, it was concluded that either the household uses a lot of time in the two sub-activities or only a small amount of time for both of them. The various production methods constituting a food-chain are rather time-homogeneous, we may say, and therefore it makes no difference to which the sub-activities we refer. However, because meal preparation is a daily activity, time consuming and in some way more narrowly connected to food than the other elements of the chain of meal activities, the analyses will concentrate on that activity.

Table 2. The correlation between different sub-activities in the food-chain.

(N:2297)	Shopping	Meal-preparation	Cleaning up/ washing up
shopping	1.000		
meal-preparation	0.083**	1.000	
cleaning up/ washing up	0.084**	0.381**	1.000

*Pearson correlation coefficients, sign on 0.01-level
 **Pearson correlation coefficients, sign on 0.001-level

In economic terms preparation of food is a combination of use of time and food expenditure. Assuming that the correlation between the rate of processing and the price is positive, and the processing in the industry is negatively correlated to the level of preparation in the household, the price and preparation time will become substitutes. These correlations may call in question whether highly processed foods are indeed more expensive than low processed foods. Thøgersen (1992) discusses the "modernization" of life styles, which among other things means more processed and packaging-intensive foods. In the USA packaging already ac-

counts for as much as raw material in household budgets, which to some extent may support the first assumption. The other assumption that processing in the industry is negatively correlated to the level of preparation in the household, is more questionable. Many low processed foods do not need much further preparation; however, in general, it is assumed that the hypothesis may hold. The empirical analyses build on the assumption viz. that a negative correlation between price and preparation time exists. The consequence is that either the household is time-intensive and expenditure-extensive or expenditure-intensive and time-extensive or something in between in order to attain a certain quantity and/or quality of the meal. The household can also become intensive in the use of both resources as well as extensive thereby gaining another level of satisfaction.

In practice several food regimes, which refer to the combination of time use and expenditures, are possible. In figure 6 food regimes D and M utilize very much time and money and very little time and money, respectively. This means that pattern D creates a higher level of consumption than pattern M. In the first case the household chooses to save neither time nor money, and in the other case the household saves on both of these resources. Whether this is in accordance with various preferences, or for example whether the household in pattern M is both time-poor and poor in terms of money is an open question.

Figure 6. Food-regimes.

Time	Expenditures			
	very small	small	large	very large
very much	A	B	C	D
much	E	F	G	H
little	I	J	K	L
very little	M	N	O	P

The households in food regimes A and P are similar in their level of consumption but vary in the allocation of time and money. In pattern A the household chooses a time-extensive and expenditure-intensive production method, as opposed to that in pattern P, where the household chooses an expenditure-extensive and time-intensive production method. This means that the household in A substitutes expenditure for time, whereas the household saves time by paying more money on foods in pattern P. The households in the other groups lie in between the extremes.

Classification of foods in food regimes

There is no statistical survey that include both household expenditure data and data on time use. The Time Use Survey by the Danish Institute on Social Research includes diary statistics on various activities, i.e. shopping, preparation time, eating, etc., and the Expenditure Survey by Danmarks Statistik among other things include data on expenditure for different foods and services, including expenditure for eating out. Consequently the same statistical survey does not allow a direct study of the connection between time use and special kinds of foods, i.e. to illustrate the input of the economic resources, time and goods in a certain activity.

However, the expenditure survey renders it possible to make a normative categorisation of different foods, where the level of preparation is one of the issues. This means that one has to establish whether various kinds of foods are manufactured in a way, which makes them ready for final consumption, and thereby more and less time-consuming for the household. Another issue is the price of the foods, which implies a separation in more and less expensive ones. Consequently every kind of food has to be defined by the level of expenditure intensiveness and the level of time intensiveness, respectively.

These issues are relative, in the way that it does not make sense to compare foods, which are not perceived as substitutes from a consumer point of view. Of course in a way all foods are substitutes, because they to some extent fulfil the purpose of nutrition etc. Nevertheless, we classify foods by the kind of meal they are a part of, dinner, breakfast/lunch or snacks, and by the criteria of preparation/place of consumption, i.e. expenditure for foods prepared at home versus expenditure for eating out. We assume that the household chooses foods within these criteria, depending on the time intensity - time use -, and expenditure intensity - price - of the foods. In this manner we reveal their preferences for time and money.

According to ordinary research practice distinction is made between convenient foods and non-convenient foods, where the first group according to Capps et al. (1983) contains "...fully prepared or partially prepared food items where some or all of the preparation time, culinary skills, or energy inputs are provided by the food processor-distributor rather than in the home-maker's kitchen". In other words, it is assumed that prefabricated food is also fast food in the eyes of the household, in spite of the fact that this is not always the case. Some highly processed foods require almost as much preparation time as non-processed ones. Vegetables is one example, where frozen and canned products often belong to the group of non-convenient food. This is incompatible with Capps, who describes canned and frozen fruit, vegetables, and juices, shelled nuts, and yoghurt as basic convenience foods, which means that such items are processed for preservation purposes rather than to offer the home maker saving on time or energy, to employ Capps' own definition. Douglas (1976) defines convenient products and services, as goods "...which enables the women to economize on time devoted to the performance of meal preparation", ignoring the rate of prefabrication.

By convenient foods is understood such items as ready to eat cookies, frozen and canned entrees, frozen desserts, canned soups, etc., which embody multiple ingredients, provide high levels of time saving and/or energy inputs, and have culinary expertise built in, according to

Capps' definition of complex convenient foods. Together with some manufactured convenience foods with no home-prepared counterparts, i.e. the last convenience group by Capps, embodying carbonated and alcoholic beverages, breakfast toaster pastries, dry cereals, etc., such items are what is ordinarily thought of as fast or convenience foods.

Lindvall (1989) also separates foods in essential and non-essential foods, where the latter group consists of desserts, cakes, beverages, etc. The argument is that foods, which are part of ordinary and everyday activities are more sensitive to economic factors than other foods. Also the lack of time-intensive substitutes for some of these items is a reason for Lindvall to exclude them from the analyses.

In this paper another criterion to disaggregate foods, viz. which kind of meal it is a part of, is used. All foods that are not ingredients in the main meal, i.e. dinner, are classified within the lunch, breakfast activity or the "snack" category. Separating according to convenience, semi-convenience, non-convenience criteria, gives four non-main meal groups, viz. the FLB-group, **f**ast **l**unch/**b**reakfast in canteens, the SPLB-group, **s**emi-**p**reparation **l**unch/**b**reakfast, containing bread, milk products, cereals, etc., the PLB-group, **p**reparation **l**unch/**b**reakfast, with items such as sandwich spread, eggs, salads, etc., and the **S**Nacks-group of biscuits, cakes, sweets & fruit.

Similarly the main meal is separated by the level of convenience, i.e preparation foods, semi-preparation foods or fast foods, and at the same time every meal is assumed to consist of two parts, a meal-base and a meal-complement. This distinction, made by Lindvall, ensures that the household can choose a dinner, where part of the food is time-intensive, while other parts are expenditure intensive. Contrary to Lindvall we let meat, fish, etc. go in the meal-base groups, and vegetables, potatoes, rice, etc. into the meal-complement groups. The argument is that this is in accordance with Danish eating traditions. Only meals made by preparation base foods, preserved or non-preserved meat, fish, etc., and preparation complements, potatoes, rice, pasta, vegetables, etc., are perceived as preparation meals, and similar to that by semi-preparation meals is meant meals made of breaded fillet of fish, etc. and fast complement foods, processed potatoes and vegetables, etc. Finally fast meals consist of fast base, complete meals, soups, etc. For all of these kind of meals desserts of varying preparation may complete the meals.

To make a preparation meal, fats, spices, and other preparation items usually have to be utilized. Just as Capps et al. (1983) we classify such items as accessory items, in spite of the fact that some of them are used in the baking of bread, preservation of jam, etc. These accessories are not used in a particular meal, which allows the household to allocate the preparation time more freely and not immediately before the time of eating. Together with preparation-base and preparation-complements the different items of accessory items will be characterized as preparation meals in total.

The most convenient way of eating is eating out. In Bonke (1988) meals out, and consumption foods similar to FLB above, are opposites to eating at home, illustrated by an overall allocation of time between a time-saving and a time-consuming strategy. However, it may be argued

that eating out is also time-intensive because of transportation and the time spent on eating. First of all eating is not categorized as a productive activity. There is no indirect utility by performing this activity, according to the third person criterion (Bonke, 1987); there is only the fulfilment of direct utility as nutrition, relaxation, social behaviour, etc. Secondly transportation is not necessarily longer than the shopping time, time for cleaning up, washing up, etc., and when eating a prepared meal in a canteen, time consumption is obviously lower as compared to the time spent for shopping for foods, and preparing them for packed lunches, or the time spent in travelling to and from the working place to eat lunch at home. This means that we assume eating out is time-intensive as well as expenditure extensive compared to home meals.

The above classification of foods is shown in figure 7, and the classification numbers from the Expenditure Survey by Danmarks Statistik in Appendix 1.

Figure 7. Classification of foods.

NON-CONVENIENCE	SEMI-CONVENIENCE	CONVENIENCE
Preparation Meals: PB1 - non preserved (meat & fish) PB2 - preserved (meat & fish) PC1 (potatoes, rice, pasta) PC2 (vegetables) PD (custard pie)	Semi-Prep. Meals: SPB (panned fillet of fish etc.) SPC1 (processed potatoes) SPC2 (preserved vegetables, etc.) SPD (preserved fruit)	Fast Meals: FB (complete meals, soups) FD (fast dessert)
Accessory Stuffs: AS1 - (fats) AS2 - (spices) AS3 - (others)	Acc. Stuffs Ready Made (sauce etc.)	Meals Out: MO 1 (bar) MO2 (restaurant)
Preparation Lunch/Breakfast: PLB1 (flour, yeast) PLB2 (sandw. spread, eggs, salads)	Semi-Prep. Lunch/Breakfast: SPLB1 (bread) SPLB2 (milk products, cereals)	Fast Lunch/Breakfast: (canteen)
		SNacks: SN1 (biscuits, cakes, sweets) SN2 (fruit)

To summarize, based on the groups in figure 7, the total expenditure for preparation meals(PM), semi-preparation meals (SPM), fast meals excluding and including eating out (FM, MO), non-convenience food (PM, AS, PLB), semi-convenience food (SPM, ASRM, SPLB), convenience food (FM, MO, FLB, SN), and home food (PM, SPM, FM, AS, ASRM, PLB, SPLB) will be analyzed. The analyses will be carried out assuming that preparation food and non-convenience food belong to food consumption regime A and fast food and convenience food to regime P, while semi-prepared food and semi-convenience food lie in between, see above.

Measuring the amount in each group is of course a problem, because no household will belong to only one category. The expenditure for food is spread out on nearly all the variants. Therefore the relative size of expenditures for a certain group will be taken as a measure of the preference for that particular category, which means that the absolute level does not count. For a group of households in a time-extensive and expenditure intensive food regime the average expenditure for preparation foods in relation to expenditure for all other foods should be larger than for households in a time-intensive and expenditure extensive food regime, just to give an example of how to analyze household economic behaviour.

In the expenditure survey "daily" expenditures including expenditure for foods have only been recorded during two weeks for each household. Therefore the level of expenditure varies because some foods are bought with irregular intervals and not every 2 weeks. Frozen foods and eating out are obvious examples. For some households the relative share of some foods is big, merely because the total expenditure is small. Therefore we also measure the significance of each group in absolute terms, as the expenditure in the relevant currency.

Table 3. Expenditures in the life cycle in DKK.

		All foods	all food ¹ per unit	home food ² per unit	meals out ³ per unit
	N	mean/(SD ⁴)			
Singles, < 45 years	241	11.313 (0.60)	11.313 (0.60)	7.015 (0.69)	2.311 (1.58)
Couples, < 45 years	158	22.542 (0.48)	13.098 (0.48)	8.749 (0.57)	2.206 (1.43)
Couples, - preschool children	293	25.158 (0.39)	11.865 (0.39)	8.491 (0.43)	944 (1.48)
- school children	282	27.601 (0.37)	12.029 (0.37)	8.939 (0.39)	842 (1.42)
Singles, - preschool children	30	18.074 (0.50)	13.903 (0.49)	10.325 (0.54)	783 (1.31)
- school children	60	17.958 (0.40)	11.858 (0.38)	8.769 (0.46)	799 (1.16)
Couples, > 44 years	224	19.563 (0.51)	11.367 (0.51)	8.844 (0.54)	750 (1.97)
Singles, > 44 years	107	12.940 (0.64)	12.940 (0.64)	9.022 (0.63)	1.640 (1.80)

¹Inclusive SN1+SN2.

²PM+SPM+FM+AS+ASRM+PLB+SPLB.

³MO+FLB.

⁴() Standardized SD.

However, the level of expenditure depends on the size and composition of the household. Couples spend more on food than singles, families with children more than families without children, etc., see table 3. By employing an equivalence scale, where each member of the household gets a unique weight compared to the weight of one for the "first" adult, we have a unit expenditure measure - the cost per consumer -, which renders food expenditures for different households comparable. Beside the estimation of an implicit index, where food expenditure is the dependent variable and the number of adults and children are predictors, we also have an explicit index, see table 4.

Table 4. Equivalent scales for expenditures on food.

	Food	Home food	Home food
	implicit weights ¹	implicit weights ¹	explicit weights ²
One adult	1.00	1.00	1.00
Second adult	0.72	0.87	1.00
Child, < 7 years	0.19	0.18	0.66
Child, 7-14 years	0.41	0.51	0.97

¹The regressions also include the number of children as a variable, see appendix 2.

²Expenditure estimates on kilojoule-recommandations, see appendix 2.

However, the implicit weights not only explain pure economies of scale related to the same food regime, they may also be due to varying composition of food regimes. To cope with part of this problem the implicit weights for home food alone are found, excluding eating out, and it can be seen that these implicit weights are a bit more like the explicit weights, than the former implicit weights were.

These weights as well as the relative expenditure measure, see above, where there is no need for family-composition corrections, are the measures used in the following empirical analyses of food regimes.

When expenditures on foods in table 3 are corrected by the implicit weights for all foods, only small differences between the life cycle groups were found. For expenditures on home food the differences are also rather small, especially singles with preschool children who have a relative high expenditure in this category. Finally mention is made of expenditures on meals out, where the differences between households with children as well as old childless couples and other life cycle groups are weighty when correcting for family compositions.

Food regimes and food-expenditure

The expenditures for different food-categories are shown in table 5, where it can be seen that preparation meals amount to the most. About 24 per cent of all food expenditures are used in this category. Then follows expenditures on accessory stuffs and meals out with expenditures

of 8 to 7 per cent each, and finally there are semi-preparation meals and fast meals each amounting to 3 per cent of the total expenditure. This means that preparation meals account for more than two thirds of all expenditures on main meal foods, and semi-preparation meals and fast food amount to nearly one third of these expenditures. Lunch and breakfast expenditures are also mostly for preparation items with 23 per cent of all expenditures in this category, but here semi-prepared and fast lunch and breakfast expenditures account for as much as 14 per cent, which is nearly forty per cent of lunch and breakfast expenditures. The last category, which is snacks, takes up 18 per cent of all expenditures on foods, where biscuits etc. amount to the most with nearly 13 per cent and fruit the remaining 5 to 6 per cent.

The standard deviations indicate that expenditures on fast food and fast lunch and breakfast vary a lot among households. This is the case for per cent expenditures and even more pronounced for unit expenditures adjusted for different compositions of households. One of the reasons for the variations is that not all households reported expenditures for all food categories.

Table 5. Expenditure-distribution on different food-categories.

(N:1395)	per cent expenditure		unit expenditure			
	average	<i>SD</i> ¹	all househ average DKK	<i>SD</i> ¹	per exp. househ. ² average DKK	<i>SD</i> ¹
Food category:						
Fast food						
- Meals out (MO)	7.05	1.70	889	2.10	1581	1.43
- Fast meals (FM)	2.85	1.90	382	2.86	643	2.11
Semi-prep. food						
- semi-prep. meals (SPM)	3.03	1.05	367	1.23	427	1.07
Prep. food						
- prep. meals (PM)	24.18	0.53	3029	0.80	3120	0.77
- access. stuffs (AS)	7.52	0.82	851	0.80	897	0.75
Lunch/breakfast						
- fast (FLB)	3.33	2.31	425	3.04	1087	1.74
- semi-prep. (SPLB)	10.90	0.56	1238	0.68	1263	0.65
- preparation (PLB)	22.81	0.47	2618	0.61	2662	0.59
Snacks						
- biscuits (SN1)	12.57	0.71	1489	0.88	1563	0.83
- fruit (SN2)	5.51	1.09	678	1.97	802	1.76
Homefood			8504	0.53	8529	0.52
All food			11988	0.48	11988	0.48

¹Standardized SD

²Households which had nonzero expenditures in the respective category.

If unit expenditures for all households and unit expenditure only for the households that reported expenditures in this category are compared, we find an immense reduction in the standard deviation, and also a significant difference in the level of expenditures on fast food and fast lunch and breakfast, i.e. the overall average expenditures on meals out is 889 DKK where 1581 DKK per *expenditure household* is spent on these foods. This is an indication of many 0-observations, which will be regarded explicitly in the multiple regressions in a following report.

Of course households do not only spend money on one or a few food categories. They divide their expenditure into many categories, as can be seen in the correlation matrix in table 6. Some of the most pronounced correlations are between semi-prepared meals, prepared meals, semi-prepared lunch/breakfast and prepared lunch/breakfast with correlation coefficients of 0.28 to 0.52, and between these categories and accessory items, while correlations between meals out, fast meals and fast lunch/breakfast are very low. The correlations between the different categories of non-convenient and semi-convenient foods - semi- & preparation - and convenient foods - meals out and fast meals - are also very low, except for the correlation between preparation meals and fast meals with a coefficient of 0.22, which indicates that there is at least some pattern in households belonging to different food regimes.

The main meal is composed of various preparation ingredients (PB1, PB2, PC1, PC2), and preserved vegetables (SPC2) as can be seen from the correlation coefficients in table 7. Other semi-convenient or convenient foods are not integrated quite as much in the main meal.

It is not surprising that the high correlation between bread (SPLB1) and sandwich spread (PLB2) reveals that Danes eat "Danish Smørrebrød", and also that the ingredients for home-baking, flour and yeast (PLB1), are correlated to sandwich spread, see table 8. It was also found that snacks (SN1) are correlated to preparation and semi-preparation lunch/breakfast foods and the correlations between dairy products and cereals (SPLB2) and snacks (SN1 and SN2) demonstrate that there seems to be a ready-to-eat lunch/breakfast regime. The negative correlations between fast lunch/breakfast (FLB) and preparation and semi-preparation foods (PLB1, PLB2, SPLB2) underline the theory of different regimes, although the coefficients are all very small.

However, the question is, whether households behave in an economically rational way or not.

Table 6. Correlation between different food-categories.

	MO	FM	SPM	PM	AS	FLB	SPLB	PLB	SN
MO	1.00								
FM	0.03	1.00							
SPM	0.02	0.11 ^a	1.00						
PM	-0.01	0.22 ^a	0.37 ^a	1.00					
AS	-0.04	0.08 ^b	0.26 ^a	0.38 ^a	1.00				
FLB	0.06 ^c	0.00	0.03	-0.03	-0.01	1.00			
SPLB	-0.01	0.12 ^a	0.28 ^a	0.37 ^a	0.40 ^a	-0.01	1.00		
PLB	-0.05	0.09 ^a	0.32 ^a	0.45 ^a	0.47 ^a	-0.06 ^c	0.52 ^a	1.00	
SN	0.03	0.13 ^a	0.26 ^a	0.34 ^a	0.35 ^a	-0.01	0.43 ^a	0.36 ^a	1.00

^{abc} Pearson correlation coefficients, sign. on 0.001, 0.01, 0.05-levels

Table 7. Correlation between different food-categories in the main meal.

	PB1	PB2	PC1	PC2	PD	SPB	SPC1	SPC2	SPD	FB	FD
PB1	1.00										
PB2	0.29 ^a	1.00									
PC1	0.19 ^a	0.20 ^a	1.00								
PC2	0.18 ^a	0.21 ^a	0.20 ^a	1.00							
PD	0.01	0.04	0.01	0.07 ^b	1.00						
SPB	0.11 ^a	0.06 ^c	0.07 ^b	0.06 ^c	0.06 ^c	1.00					
SPC1	0.07 ^b	0.22 ^a	0.12 ^a	0.09 ^b	0.04	0.01	1.00				
SPC2	0.27 ^a	0.29 ^a	0.21 ^a	0.26 ^a	0.07 ^b	0.08 ^b	0.11 ^a	1.00			
SPD	0.05 ^c	0.07 ^b	0.06 ^c	0.15 ^a	0.07 ^b	0.02	0.04	0.15 ^a	1.00		
FB	0.21 ^a	0.14 ^a	0.03	0.07 ^c	-0.02	0.06 ^c	0.05	0.09 ^b	0.02	1.00	
FD	0.04	0.05	0.03	-0.01	0.04	-0.08 ^b	0.01	-0.00	0.04	0.01	1.00

^{abc}Pearson correlation coefficients, sign. on 0.001, 0.01, 0.05-levels

Table 8. Correlation between different food-categories in lunch/breakfast and snacks.

	PLB1	PLB2	SPLB1	SPLB2	FLB	SN1	SN2
PLB1	1.00						
PLB2	0.23 ^a	1.00					
SPLB1	0.09 ^b	0.52 ^a	1.00				
SPLB2	0.14 ^a	0.26 ^a	0.27 ^a	1.00			
FLB	-0.04	-0.05 ^c	0.01	-0.03	1.00		
SN1	0.15 ^a	0.34 ^a	0.40 ^a	0.25 ^a	0.02	1.00	
SN2	0.16 ^a	0.20 ^a	0.16 ^a	0.20 ^a	-0.04	0.22 ^a	1.00

^{abc}Pearson correlation coefficients, sign. on 0.001, 0.01, 0.05-levels

Household characteristics

The food regimes are defined by the time intensity and the expenditure intensity, respectively, for a certain level of quality in the food preparation. This means that some foods require much time and little expenditure, others little time and heavy expenditure, etc. If this is translated into household criteria, it means that households behave in a rational way, when their resources, i.e. income and time are allocated to different regimes in an economic way.

Disposable income

When referring to economic resources the income is ordinarily emphasised. The more money, the heavier the expenditure, and consequently larger expenditure for foods.

The income concept has to exclude taxes and include public transfers, i.e. disposable income,

in order to measure the opportunity to buy goods, services etc. However, the disposable income is not always equal to the actual consumption. First the value of wealth may change because of positive or negative savings, and thereby consumption becomes smaller or larger, respectively, than the disposable income. Secondly, there may be income, which is not reported to the tax-authorities by the household. Therefore the total expenditure is preferred as a measure of comprehensive consumption, i.e. permanent income, (Wagner and Hanna, 1983).

As mentioned above, the daily expenditure in the Expenditure Survey is only reported for a two-week period and then multiplied to cover a full year. This gives rise to uncertainty in the measurement of consumption. Therefore total expenditure is calculated by income information in the survey and here used in the statistical analysis under the designation disposable income.

Not all expenditures are disposable in the short run. Most people have to pay regular outlays every month before ending up with their "real" disposable economic resources. These regular un fixed costs include expenditure for housing (Homan, 1988), and according to Lindvall (1989) also expenditure for commuting. In practice only the expenditure for housing is subtracted from the total expenditure, and this is also what we do, when referring to variable income in an analysis in a following report. One of the advantages achieved when operating with this concept is the comparability between owners and tenants, because of the privilege of deducting interest on loans on income tax returns, which, *ceteris paribus*, over-estimates owner disposable incomes.

Like the correction of food expenditure for different household compositions, an adjustment is also made to the disposable income. However, the equivalent scale is not quite the same, because economy of scale is different for various types of expenditure. Thus eight different equivalent scales - one for each expenditure type - have been estimated and weighted by their relative share of total expenditures for the average household, thereby revealing a substitution effect as well as an income effect. However, because of the quality of the data the equivalent scale applied is estimated on all expenditures without any differentiation and weighting procedure. Consequently the disposable income for two-adult households is divided by 1.99, two-adult households with a preschool child under 7, 2.34, and two-adult households with a school child, between 7 and 16 years, 2.42, see table 9 and appendix 2. These factors are rather similar to Lindvall's (1989) explicit factors.

Table 9. Equivalent scales for different types of expenditures - implicit weights¹.

	One adult	Second adult	Child < 7 years	Child 7-16 years	Expendi- tures
		- equivalent -			- per cent -
Food, beverages, tobacco	1.00	0.67	0.15	0.43	18.1
Clothing, footwear	1.00	0.92	0.08	0.71	5.1
Gross rent, housing main. Fuel & lighting	1.00	1.19	0.67	0.53	32.4
Furniture, household appl.	1.00	1.08	1.18	0.69	6.6
Med. care & health exp.	1.00	1.08	-0.15	0.22	1.9
Transport & comm.	1.00	1.45	0.17	0.37	16.8
Recreation, entertain. etc.	1.00	0.52	0.49	0.48	8.3
Misc. exp.	1.00	0.81	-0.08	0.10	10.8
All expenditures, weighted (UNITAGG)	1.00	1.02	0.38	0.44	100.0
All expenditures, not weighted (UNITC)	1.00	0.99	0.35	0.43	

¹ see Appendix 1

Disposable time

In order to find the time disposable for household work and leisure activities, daily personal care including sleep has to be subtracted from the 24 hours. The time for child-minding is not disposable in this context. Some tasks have to be done, which means that children require committed time, cf. Ås's (1982) committed time activities. Also excluding working hours, contracted time (Ås, 1982), and commuting time, leaves the disposable time, required in the following analysis.

The use of time for the activities mentioned above is not reported in the Expenditure Survey. However, from the Time Budget Survey it can be seen that adult women and adult men on average sleep 7.8 and 7.3 hours on weekdays, respectively. Getting dressed etc. takes another 0.5 hours for women and 0.4 hours for men. This means that personal care takes nearly the same time for the two sexes. This leaves 16 hours per (week-)day for other activities.

Children leave less disposable time (their demand on parent time is bigger than their own supply of time), which may raise the opportunity cost of time. However, many of the child-min-

ding activities take place in the home, and are not restricted to certain hours, just as the possibility of joint production is considerable. Taking care of small children means much so-called "stand-by caring", (Bonke, 1989), where there is an opportunity to do other things, e.g. meal preparation. Consequently the opportunity cost of time for child-minding is very low in this narrow perspective. Nonetheless, for households where the youngest child is less than 7 years old, and for households where the youngest child goes to school, i.e. is 7 to 17 years old, the disposable time is reduced by 2.6 and 1.0 hours per weekday, respectively. Economy of scale in time use, (Bonke, 1989) means that the number of children account for +0.7 hours per child in couples, see the regression coefficients in table 10.

Working hours are definitely the most restricting time use, and therefore also the most important factor determining the opportunity cost of time. The more hours on the labour market, the higher the price of time. Shift work of course modifies this correlation, and also time spent on commuting is of importance. None of these factors are reported in the Expenditure Survey, however, and working hours are only put down as part-time or full-time employment. From the Time Budget Survey we know that an ordinary part-time job takes 5.9 hours per weekday including transportation, and a full-time job 7.6 hours for women and 9.3 hours for men. The difference is caused by more overtime and supplementary jobs, as well as the transportation time, for men. However, because of substitution in time use, women's part-time work only gives rise to a 3.8-hour reduction in their disposable time, while full-time work diminishes women's disposable time by 5.2 hours, see table 10.

Table 10. Disposable time - coefficients in regression analyses¹.

	Men (N:682)		Women (N:772)	
Dependent variable:	Mean			
DISPTIME	406.7		568.8	
Independent variables:	B	SD	B	SD
Constant	442.9	16.1	794.3	18.3
COUPLES	-21.9	19.7	29.3	17.1
CHILD	16.7	12.8	25.0	11.7
CHILDPR	-56.0	29.1	-99.8	26.2
CHILDSC	-23.8	27.6	-33.2	25.6
PARTTIME2	-10.9	17.8	-229.4	20.8
FULLTIME2			-312.6	18.4
R ²	0.0165		0.3351	
Adj. R ²	0.0078		0.3286	

¹Time budget survey (Andersen,1987).

² Men work fulltime in this sample, therefore parttime & fulltime refers to women.

For a double-career family with two full-time jobs, and a preschool child, 16.0 hours are spent on personal reproduction, 16.4 hours on economic survival, and 2.0 hours for generational reproduction. The opportunity cost of time is therefore very high for such a family, which has only 13.6 hours of disposable time per weekday for household work, eating and free time - leisure.

In the Expenditure Survey disposable time is estimated by the coefficients found in the regression analyses of the Time Budget Survey, see table 10. Because the two surveys are different, - the first one is an individual test sample and the second one is at the household level - "synthetic households" were generated by the Time Budget Survey by information on the spouse. A comparison of mean disposable time generated by the two surveys show only small differences, mainly due to a higher relative number of preschool children in the Time Budget Survey compared to the findings in the Expenditure Survey.

Productivity

The food consumption level is not merely determined by the amount of time and money spent, but also by the productivity in the food-processing. This means that some measures of productivity must be incorporated in our analysis, and this is done by including real and human capital in households.

By productivity is meant expenditure saved per unit of time, assuming that the prices do not vary. In this cross-sectional study the prices are assumed to be very uniform in different regions. However, the multiple regression analysis includes urbanization as an explicit variable to cope with this problem.

Of course, a modern household possesses a minimum of household appliances for food-processing. Gas or electric cookers, ovens, and refrigerators are examples of such basic appliances. Other appliances are not necessary, but function as time-saving investments. Freezers, automatic dishwashers, and microwave ovens may substitute some of the household production with processed goods, i.e. cooking a meal of an equivalent quality in a more convenient way.

Like real capital also human capital is assumed to determine productivity in household production.

A positive correlation between productivity and the home maker's educational level is anticipated. For couples it means that highly educated women are more effective in shopping, practicing modern technological methods, and are more keen on choosing time-saving strategies, compared to women with a lower education.

Furthermore, it is assumed that the experience obtained in learning by doing affects productivity. The measure for this is the age of the homemaker, i.e. the women in couples. In other

words, the older the woman, the higher the productivity in household production. The rate of productivity is declining, however, which is why the square value of age will be included as an independent variable in the regressions.

Because of conventional upbringing, girls gain more experience in housekeeping than boys do (Bonke, 1989). In samples including both singles and couples, sex consequently becomes an independent variable.

Finally the number of household members affects productivity in food-processing. At the same time there are economies of scale and joint production, i.e. child-minding and meal-preparation, which means that fewer resources are required to produce one portion of a meal.

Lindvall (1989) mentions another example of joint production, viz. the case where food preparation results in indirect utility: a meal, and direct utility: pleasure. The daily meal, however, is assumed to contain only restricted pleasure, which is in agreement with Lindvall and Dow and Juster (1985).

Finally ownership of a house is believed to be of significance for the character of household production. More store rooms, and gardens for vegetable growing, enlarges household production as opposed to buying convenient foods.

6. Mean values of household characteristics

In table 11 the means and SD of the resource variables in this report are shown. The disposable income (DISPINC) varies between 23.900 and 759.900 DKK with a mean of 175.184. Adjusted by the equivalent scale, UNITC, the variation is reduced from 0.50 to 0.39 SD/mean, and the lowest income (UNITINC) is 16.800 and the highest is 349.300 DKK.

The mean disposable time (DISPTIME) is 13.8 hours (825 minutes) per weekday per household, singles and couples together. Because the sample only includes households with full-time working men, disposable time apparently varies very much between the two sexes, i.e. an average of 9.5 hours for women and 6.6 hours for men per weekday. However, the differences may also be due to other conditions than working time, which is indicated by the higher minimum disposable time of women than that of men - 6.0 versus 5.5.

Table 11. Resources in the household - means and standard deviation of independent variables.

		means	<i>SD</i> ¹
DISPINC	total expenditure	175.184	0.50
VARINC	DISPINC - housing costs	118.396	0.54
UNITINC	DISPINC/UNITC	95.114	0.39
DISPTIME	1440(2880) minutes - (personal care + working time incl. transportation + childcare time)	825	0.26
EDUTIME	years of formal education	2.5	0.47
AGE	age of adult, the wife in couples	38	0.33
UNITC	members in the household	1.83	0.30
COUPLES	couples/all households	0.69	0.68
CHILD	number of children (0, 1, 2, 3, 4+)	0.84	1.20
CHILDPR	youngest child of preschool age < 7 years old/all households	0.23	1.83
CHILDSC	youngest child of school age 7-17 years old/all households	0.25	1.78
APPL	households with washing machine and/or microwave oven/all households	0.38	1.28
DOMSERV	expenditures for domestic servant (positiv/0)	0.06	3.86
URBAN	size of the biggest town in the district; 1-4, growing	2.56	0.48
OWNREN	owners of houses/all households	0.61	0.80

¹Standardized SD

The correlations between the independent variables are illustrated in table 12, and it is not surprising that the biggest coefficient is found between disposable time (DISPTIME) and marital status (COUPLES). On the other hand the positive correlations between disposable time and children (CHILD) and between disposable time and oldest child (CHILDSC) seems at first more astonishing. The explanation may be that part-time work substitutes women's full-time work when children grow up.

The higher disposable income (DISPINC), the more investments in appliances (APPL) and consumption of domestic service (DOMSERV), which indicates no substitution between these two time-saving strategies, see also the coefficient between APPL and DOMSERV.

However, the positive correlation between the possession of appliances (APPL) and disposable time (DISPTIME) calls the relevance of APPL as a time-saving variable in question.

Table 12. Correlation between the independent variables.

	DISPINC	DISPTIME	EDUTIME	AGE	COUPLES	CHILD	CHILDP	CHILDS	APPL	DOMSERV	URBAN	OWNREN
DISPINC	1.00											
DISPTIME	-0.08 ^b	1.00										
EDUTIME	0.10 ^a	-0.13 ^a	1.00									
AGE	-0.02	0.10 ^a	0.07 ^c	1.00								
COUPLES	0.00	0.83 ^a	-0.06 ^c	0.07 ^c	1.00							
CHILD	0.05	0.29 ^a	0.02	-0.21 ^a	0.36 ^a	1.00						
CHILDP	0.02	0.08 ^b	-0.01	-0.32 ^a	0.26 ^a	0.55 ^a	1.00					
CHILDS	0.02	0.20 ^a	0.03	0.04	0.17 ^a	0.47 ^a	-0.31	1.00				
APPL	0.21 ^a	0.27 ^a	0.02	0.10 ^a	0.40 ^a	0.32 ^a	0.18 ^a	0.18 ^a	1.00			
DOMSERV	0.20 ^a	0.03	0.06 ^c	0.08 ^b	0.09 ^b	0.05	0.07 ^b	-0.02	0.13 ^a	1.00		
URBAN	-0.13 ^a	0.15 ^a	-0.09 ^b	0.03	0.22 ^a	0.19 ^a	0.10 ^a	0.08 ^b	0.16 ^a	0.06 ^c	1.00	
OWNREN	0.17 ^a	0.39 ^a	-0.01	0.20 ^a	0.56 ^a	0.35 ^a	0.21 ^a	0.18 ^a	0.43 ^a	0.09 ^a	0.36 ^a	1.00

^{abc}Pearsons correlation coefficients significant on 0.001, 0.01 and 0.05-levels.

Table 13 shows the mean values of resources in the life cycle. Not surprisingly couples have much more disposable income and disposable time than singles. However, corrections for family-composition narrows the income differences though, young couples with and without children still have the highest income, leaving out of account old single households with nearly 105.000 DKK disposable unit income. The income resources level out even more when variable unit incomes between the life cycle groups are compared.

The relatively high disposable time found in single households with children is due to single women having the custody more often than single men, and that women work fewer hours on the labor market than men, especially in this sample selection.

Table 13. Means of disposable incomes and time during the life cycle.

	N	disposable income		unit income		variable unit income		disposable time	
		mean	<i>SD</i> ¹	mean	<i>SD</i> ¹	mean	<i>SD</i> ¹	mean	<i>SD</i> ¹
		DKK		DKK		DKK		minutes	
Singles, < 45 years	241	93.623	0.45	93.623	0.45	68.223	0.50	423	0.02
Couples, < 45 years	158	195.865	0.39	98.672	0.39	68.051	0.45	933	0.11
Couples, - preschool children	293	224.774	0.32	98.314	0.32	63.815	0.38	872	0.14
- school children	282	231.789	0.39	97.999	0.39	66.838	0.43	942	0.09
Singles, - preschool children	30	106.524	0.32	82.004	0.32	60.618	0.35	681	0.12
- school children	60	121.776	0.31	88.334	0.31	59.449	0.31	682	0.21
Couples, > 44 years	224	169.298	0.42	85.288	0.42	57.271	0.49	958	0.12
Singles, > 44 years	107	104.897	0.41	104.896	0.41	68.237	0.49	424	0.02

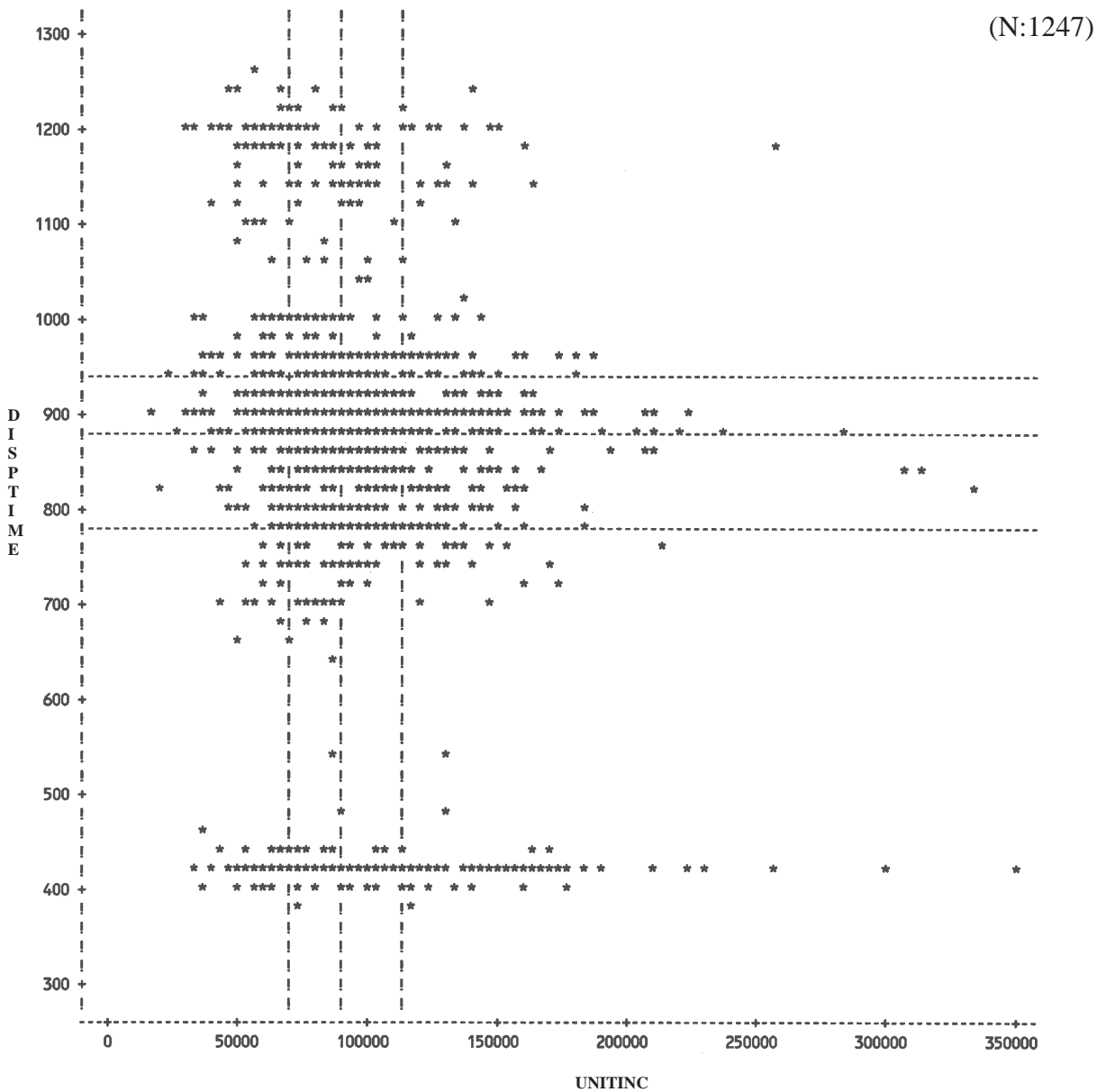
¹Standardized SD

7. Food regimes, disposable time and disposable income

The main purpose of this study is to examine whether households optimize their economic resources - time and money - in relation to the main activities in the food-chain. This means that households, who are both rich and busy, are assumed to demand time-intensive and expenditure-extensive foods, while poor and idle households demand time-extensive and expenditure-intensive foods, to mention some extreme examples.

By ranking the households according to increasing disposable unit income, we designate the first quartile - twenty five percent - as poor households, and the last quartile as rich households. The disposable time is categorized correspondingly, where very busy households belong to the lowest time-quartile with a maximum of 776 disposable minutes per weekday, busy households between 776 and 878 minutes, idle households between 878 and 933 minutes hours, and finally the very idle households at least 933 minutes a weekday. The distribution of households by these criteria and the combination of time and money resources are illustrated in figure 8, where it can be seen that the main part of the observations are distributed very evenly. However, the time resource is not in general distributed as evenly as the income resource.

Figure 8. Correlation between disposable time and disposable money - a plot diagram.



In table 14 we find unit expenditures on foodstuffs distributed by their degree of convenience for households with varying economic resources. Firstly, non-convenient foods are not, as assumed, more pronounced in economically powerful households than in weak ones. If anything, very poor and very idle households buy relatively less of these foodstuffs than the other categories, which is also confirmed when classifying households by disposable income-only. Very rich households spend 119 DKK and very poor households 83 DKK for every 100 DKK of the total average household.

On the contrary, the buying of semi-convenient food and convenient food seems to verify our hypotheses on economic rationality when buying foodstuff. Though there is no relationship between disposable time and expenditures on semi-convenient foods, we find positive correlations between the expenditures on these foodstuff and disposable income, and the combined time and money household categories. The more resources, the more expenditures on semi-convenient foods, and this is even more pronounced for convenient foods. The expected correlations between disposable time, disposable income and convenient foods seem verified, when the household categories very rich & very busy, rich & busy, poor & idle, and very poor & very idle households spend 148 DKK, 101 DKK, 92 DKK and 56 DKK, respectively, of an overall average household expenditure of 100. However, because of the very big standard deviations pair-wise comparisons of these figures as well as of the other figures in table 14 give no statistical significant differences in unit expenditures between the household categories.

Table 14. Unit expenditures on foodstuffs in different households.

Household categories ² :	N	Non-convenient food		Semi-convenient food		Convenient food	
		mean	<i>SD</i> ¹	mean	<i>SD</i> ¹	mean	<i>SD</i> ¹
Income and time							
Very rich & very busy	81	99	0.68	117	0.81	148	0.87
Rich & busy	90	102	0.40	109	0.51	101	0.58
Poor & idle	82	103	0.47	98	0.56	92	0.67
Very poor & very idle	96	85	0.47	83	0.58	56	0.78
Income							
Very rich	311	119	0.55	120	0.61	130	0.71
Rich	313	102	0.48	104	0.54	99	0.67
Poor	311	102	0.54	97	0.60	94	0.78
Very poor	312	83	0.53	85	0.61	69	1.01
Time							
Very busy	310	93	0.67	100	0.75	117	0.92
Busy	310	104	0.49	107	0.55	99	0.65
Idle	315	105	0.53	102	0.55	93	0.78
Very idle	312	103	0.49	98	0.56	83	0.72
All households	1395	100	0.56	100	0.63	100	0.87

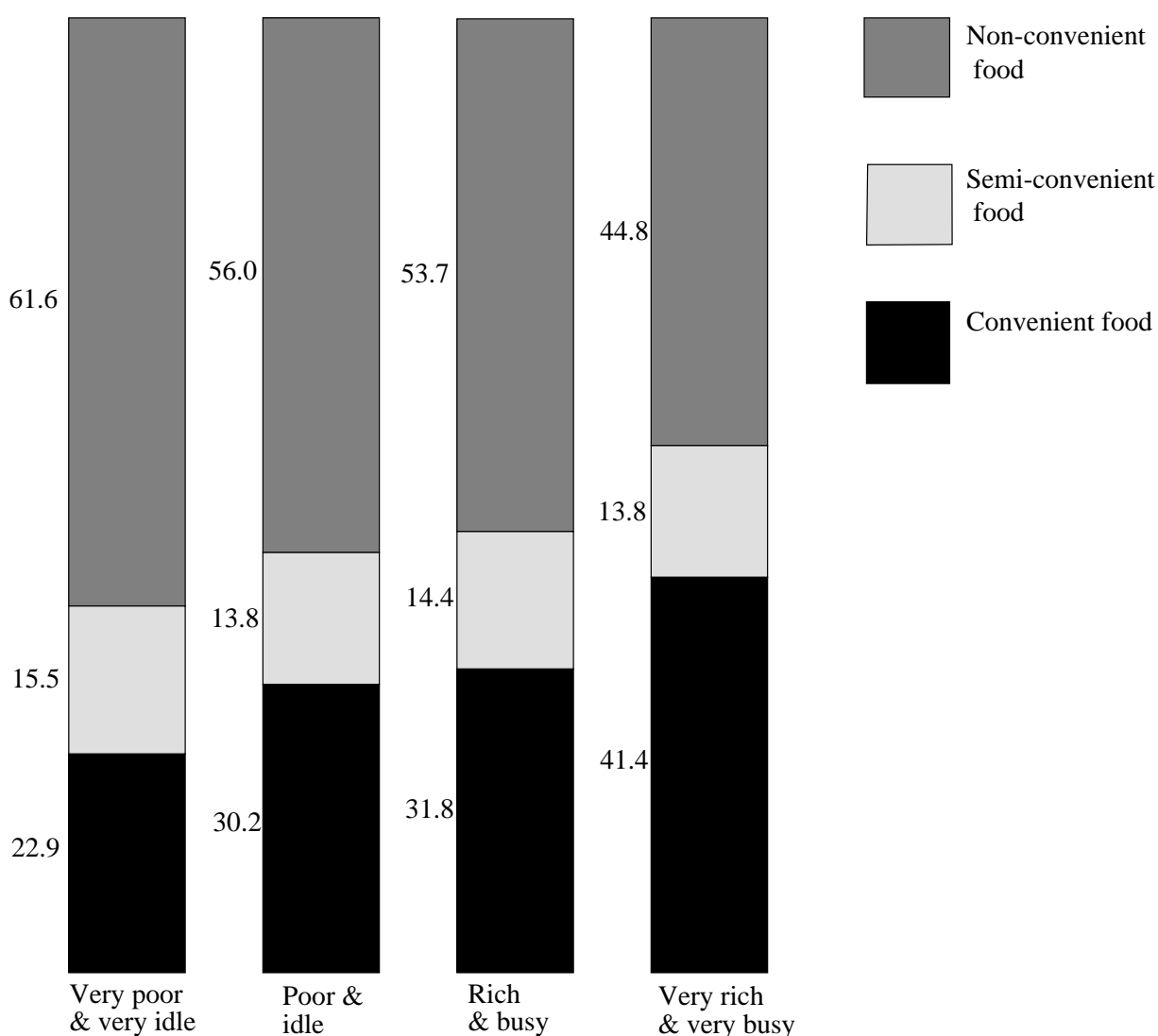
¹Standardized SD.

²The categories corresponds to the food-regimes P, K, F, A, D+H+L+P, C+G+K+O, B+F+J+N, A+E+I+M, M+N+O+P, I+J+K+L, E+F+G+H and A+B+C+D in figure 6.

In figure 9 the pattern of economic rationality is analysed by the relative expenditure on foodstuffs, and, as presupposed, a greater share of expenditures on convenient foods are found, and a corresponding smaller share of non-convenient foods the more busy and rich households we consider. The expenditures on semi-preparation foods amounts to nearly the same for all categories.

By this and the findings above, the anticipated rational behaviour when buying foodstuffs seems to be confirmed.

Figure 9. Percent expenditures on foodstuffs in different households¹.



¹The categories correspond to the food-regimes A, F, K and P in figure 6.

Considering only main meal foodstuffs, which cover 45 per cent of all expenditures (table 5), we have the same pattern. The unit expenditures on foodstuffs for preparation meals are not higher the more money and less time the households have, while expenditures on foodstuffs for semi-preparation meals, as well as on fast meals and meals out, are distributed between the

household categories in an economically rational way. The same applies for the per cent-wise distribution of expenditures on the groups of main meal foodstuffs. Here no statistically significant differences between the expenditures by household categories compared par-wise are found either.

Poor and idle households do not completely match the pattern above, because they spend the largest amount of money on preparation meals and also relatively much money on meals out, see table 15. The reason may be a socio-economic one as the age of adults (the wife in couples) is low, and the ownership of appliances and of houses is high in this category of households. This will be the topic of a following report.

However, this does not contradict the general pattern of economical rational behaviour when buying foodstuffs for the main meal. The finding that very rich & very busy households spend four to five times as much money on meals out than do very poor & very idle households, cf. table 15, seems to prove this conclusion.

Table 15. Unit and percent expenditures on main meal foodstuffs in different households.

		Prep meals	Semi prep. meals	Fast meals & meals out	Fast meals	Meals out
Household categories ²	N	mean (SD ¹)	mean (SD ¹)	mean (SD ¹)	mean (SD ¹)	mean (SD ¹)
Very rich & very busy	81	100 (0.89)	124 (1.24)	196 (1.57)	143 (1.89)	219 (1.96)
Rich & busy	90	97 (0.59)	101 (0.86)	78 (1.24)	97 (1.49)	70 (1.77)
Poor & idle	82	104 (0.71)	86 (0.92)	101 (1.37)	95 (1.51)	104 (1.82)
Very poor & very idle	96	73 (0.77)	80 (1.04)	41 (2.05)	44 (1.79)	40 (2.84)
All households	1395	100 (0.80)	100 (1.23)	100 (1.72)	100 (2.86)	100 (2.10)
		- percent -			- percent -	
Very rich & very busy	81	19.4 (0.63)	3.2 (1.25)	16.7 (1.04)	3.9 (2.03)	12.8 (1.29)
Rich & busy	90	22.9 (0.41)	3.1 (0.78)	7.7 (1.11)	2.6 (1.20)	5.1 (1.65)
Poor & idle	82	25.7 (0.49)	2.7 (0.86)	10.6 (1.30)	2.8 (1.35)	7.8 (1.73)
Very poor & very idle	96	23.7 (0.51)	3.4 (0.94)	5.0 (1.65)	1.8 (1.69)	3.3 (2.34)

¹Standardized SD.

²The categories correspond to the food-regimes P, K, F and A in figure 6.

The most affluent meals are breakfast and lunch, as they are easy to manipulate with respect to time-saving, which is confirmed in table 16, where a tendency towards rational behavior is found. Semi-preparation lunch/breakfast and particularly fast lunch/breakfast are more widespread, the more money and less time the households have. The unit expenditures on preparation lunch/breakfast do not confirm this, although the relative expenditures on these foodstuffs do.

Like the distribution of expenditures on main meal foods, see above, the household category poor & idle households do not behave entirely in accordance with the theory, which may be due to socio-economic characteristics, and it must also be mentioned that par-wise comparisons of the expenditures between the household categories do not yield significant differences.

Table 16. Unit and percent expenditures on lunch/breakfast foodstuffs in different households.

Household categories ²	N	Preparation lunch/breakf.		Semi-prep. lunch/breakf.		Fast lunch/breakfast	
		mean	<i>SD</i> ¹	mean	<i>SD</i> ¹	mean	<i>SD</i> ¹
Very rich & very busy	81	102	0.88	115	1.02	229	1.87
Rich & busy	90	107	0.47	112	0.58	87	2.04
Poor & idle	82	102	0.57	101	0.61	90	2.32
Very poor & very idle	96	95	0.50	84	0.67	19	5.62
All households	1395	100	0.61	100	0.68	100	3.04
- per cent -							
Very rich & very busy	81	19.6	0.73	10.4	0.73	7.7	1.69
Rich & busy	90	23.5	0.37	11.3	0.47	3.0	1.80
Poor & idle	82	22.5	0.39	10.9	0.57	3.3	2.22
Very poor & very idle	96	28.2	0.40	11.9	0.57	0.7	5.08

¹Standardized SD

²The categories correspond to the food-regimes P, K, F and A in figure 6.

Finally, the expenditures on snacks are shown in table 17 and no obvious pattern of rationality was found. However, very poor & very idle households spend less than the other groups on these foodstuffs, but rich & busy households spend even more than very rich & very busy, and the distribution of relative expenditures of biscuits, cakes, sweets (SN1) and fruit (SN2) are rather equal for the four household categories.

Table 17. Unit and percent expenditures on snacks in different households.

Household categories ²	N	Biscuits, cakes, sweets (SN1)		Fruit (SN2)	
		mean	<i>SD</i> ¹	mean	<i>SD</i> ¹
Very rich & very busy	81	110	0.90	89	2.51
Rich & busy	90	122	0.71	109	0.87
Poor & idle	82	89	0.68	84	1.62
Very poor & very idle	96	73	0.89	68	0.94
All households	1395	100	0.88	100	1.97
- per cent -					
Very rich & very busy	81	12.9	0.77	4.2	1.32
Rich & busy	90	15.2	0.61	5.9	0.72
Poor & idle	82	11.4	0.60	4.8	1.33
Very poor & very idle	96	11.8	0.67	5.5	0.92

¹Standardized SD.

²The categories correspond to the food-regimes P, K, F and A in figure 6.

A main pattern is found in this report, which confirms the hypothesis that households allocate their time and money resources in an optimum way. The very rich and very busy households have the largest share of the different kinds of fast foods, which groups them under food-regime P, while the poor and time idle household mostly - in relative as well as in absolute terms - buy preparation food, which is the anticipated pattern of food regime A households.

Conclusion

The main purpose of this study is to examine whether households optimize their economic resources - time and money - in relation to the main activities in the food-chain. This means that households assumed to be both rich and busy demand time-intensive and expenditure-extensive foods, while poor and idle households demand time-extensive and expenditure-intensive foods.

For the empirical analyses, the consequence is that the household either uses little time and

has large expenditures, or has small expenditures and uses much time or something in between, in order to attain a certain quantity and/or quality of a meal. The household can also become intensive as well as extensive in the use of both resources, thereby gaining another level of satisfaction.

However, the way in which people spend their disposable money and time is only one element in a chain of decisions, revealing a mode of organizing their lives. Cultural categories concerning food are important as well as the mechanisms materializing these categories. The differences in the way food is prepared, in the way meals are structured, etc. offer a reflection of the cultural diversity among households with differences in living conditions within and between countries.

Nonetheless the internationalization of the world for the past two or three decades has changed the use of food radically. An increasing "delocalization" of food production and distribution has taken place, which means that an increasing portion of the daily diet comes from distant places, usually through commercial channels.

Another major change in societal conditions is the immense increase in women's labor supply, which very much has influenced the conditions for the choice of foods. Because of a trade-off between work on the labor market and household work, we find a decreasing household production, and some changed allocation of time among household members, i.e. men's household production is to some extent increased, while women diminish their household production.

This has encouraged several strategies and combinations of strategies to intensify time use in meal preparation, and thereby reduce time pressure in the households. In this report, the focus is on the substitution between convenient goods and non-convenient goods, and the reduction of household production by buying full substitutes.

In the statistical analysis the correlation between various food regimes, consisting of foods classified by their preparation time-intensity and expenditure-intensity, respectively, and some socio-economic characteristics of the household were investigated.

The expenditure survey renders it possible to make a normative categorization of different foods, where the level of preparation is one of the issues. This means that it has to be established whether various kinds of foods are manufactured in a way, which makes them ready for final consumption, and thereby less time-consuming for the household. Another issue is the price of the foods, which implies a separation in more and less expensive ones. Consequently, every kind of food has to be defined by the level of expenditure intensiveness and the level of time intensiveness, respectively.

We classify foods by the kind of meal of which they are a part, dinner, breakfast/lunch or snacks, and by the criteria of preparation/place of consumption, i.e. expenditure for foods prepared at home versus expenditure for eating out. We assume that the household chooses foods within these criteria, depending on the time intensity - time use - and expenditure intensity - price - of the foods. In this manner we reveal their preferences for time and money.

The study sample included couples in which the husband worked full-time, 35 hours or more per week, for at least 48 weeks of the survey year. Single men also worked full time, while single women worked full-time or part-time, which means 15 hours or more per week. These and other adjustments resulted in a study sample of 1395 families.

The relative size of expenditures for a certain group is taken as a measure of the preference for that particular category. Another measure is the absolute expenditures, where we employ an equivalence scale in order to get a unit expenditure measure - the cost per consumer -, which renders food expenditures for different households comparable.

The expenditure for different food-categories shows that preparation meals amount to the most. Then follows expenditures on main meal foods, accessory items and meals out, and finally we have semi-preparation meals and fast meals each amounting to only a few per cent of the total expenditure. This means that preparation meals account for more than two thirds of all expenditures on main meal foods, and semi-preparation meals and fast food amount to nearly one third of these expenditures. Lunch and breakfast expenditures are also mostly spent on preparation items, but here semi-prepared and fast lunch and breakfast expenditures account for nearly forty per cent of lunch and breakfast expenditures. The last category, which is snacks, takes up nearly a fifth of all expenditures on foods, where biscuits etc. amount to the most.

Comparing unit expenditures for all households and unit expenditure only for the households that reported expenditures in a certain category, an immense reduction in the standard deviation is found, and also a significant difference in the level of expenditures on fast food and fast lunch and breakfast. This is an indication of many 0-observations, which will be regarded as explicit in the multiple regressions in a following report.

Like the correction of food expenditure for variable household composition, an adjustment is also made as regards the disposable income with an equivalent scale estimated on all expenditures.

The main findings in this report are the following:

- * Non-convenient foods are not, as presupposed, more pronounced in economically weak households than in affluent ones, if anything very poor and very idle households buy relatively less of these foods than do the other categories, which is confirmed when classifying the households by disposable income only.
- * On the contrary, the buying of semi-convenient food and convenient food seems to verify the theses of economic rationality when buying foods. Though there is no relationship between disposable time and expenditures on semi-convenient foods, positive correlations between the expenditures on these foods and disposable income is found. The more resources, the more expenditures on semi-convenient foods, and this is even more pronounced for convenient foods.

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- * As expected a greater *share* of expenditures on convenient foods, the more busy and rich the households are was found, and a corresponding smaller share of non-convenient foods. The expenditures on semi-preparation foods amount to nearly the same for all categories. By this the anticipated rational behavior when buying foods seems to be confirmed.
 - * When considering only main meal foods, which account for nearly half of all expenditures, the same pattern, as that of all foods distributed by their degree of convenience was found. The unit expenditures on foods for preparation meals are bigger the more money and less time the household has, while expenditures on foods for semi-preparation meals as well as on fast meals and meals out, are distributed between the household categories in an economically rational way, and the same goes for the percent-wise distribution of expenditures on the groups of main meal foods.
 - * Poor and idle households do not match the pattern above completely, because they spend the largest amount of money on preparation meals and also relatively much money on meals out. The reason may be socio-economic characteristics, which is the topic of the next report.
 - * However, this does not contradict the general pattern of economically rational behavior when buying foods for the main meal. Only the finding that very rich and very busy households spend four to five times as much money on meals out than very poor and very idle households, seems to prove this conclusion.
 - * As regards breakfast and lunch, a tendency towards rational behavior was found. Semi-preparation lunch/breakfast and particularly fast lunch/breakfast are more widespread the more money and less time the households have. The unit expenditures on preparation lunch/breakfast do not confirm this, which the relative expenditures on these foods on the other hand do.
 - * Like the distribution of expenditures on main meal foods, the household category 'poor and idle households' do not behave entirely in accordance with the theory, which may be due to socio-economic characteristics, and we also have to mention, that par-wise comparisons of the expenditures between the household categories do not yield significant differences.
 - * A main pattern is found in this report, which confirms the thesis of economic households, allocating their time and money resources in an optimum way. The rich and very busy households have the largest share of the different kinds of fast food, while the poor and time idle households mostly - in relative as well as in absolute terms - buy preparation food.

However, the standard deviation is very large in most cases, and in order to be sure that the different expenditure patterns are significantly different, a number of multiple regressions for every food-category will be performed in a later report, which will also contain international comparisons on this topic.

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Appendix 1
CLASSIFICATION OF FOODS
SNA-numbers

(System of National Accounts, UN)

PREPARATION MEALS
PB1 - non-preserved:

11211111, 11211171, 11211181, 11211211, 11211271, 11211281, 11211311, 11211312,
 11211371, 11211372, 11211381, 11211511, 11211571, 11211581, 11219911, 11221111,
 11221112, 11221172, 11221182, 11221211, 11221212, 11221311, 11221371, 11229919,
 11231111, 11231112, 11231171, 11231172, 11231181, 11231182, 11231211, 11231271,
 11231281, 11231311, 11231312, 11231371, 11231372, 11231381, 11231382, 11231411,
 11231471, 11231481,
 11231511, 11231571, 11231581, 11239911, 11239971, 11239981, 11241111, 11241171,
 11241181, 11251111, 11251171, 11251181, 11251211, 11251271, 11251281, 11251311,
 11251312, 11251371, 11251372, 11251381, 11251382, 11251383, 11271211, 11271212,
 11271271, 11271281, 11271411, 11271481, 11281111, 11281112, 11281171, 11281181,
 11281211, 11281212, 11281214, 11281271, 11281272, 11281273, 11261212, 11261272,
 11282111, 11282171,
 11282181, 11311111, 11311112, 11311171, 11311172, 11311181, 11311182, 11312111,
 11312113, 11312171, 11312181, 11312182, 11313111, 11313112, 11313113, 11313171,
 11313182.

PB2 - preserved:

11151111, 11151171, 11261312, 11261313, 11261372, 11261373, 11261611, 11261671,
 11261681, 11271111, 11271171, 11271181, 11271611, 11272111, 11272181, 11272211,
 11272281, 11272511, 11261311, 11261371, 11261381, 11271312, 11271372, 11331412,
 11321211, 11321411, 11321471, 11321919, 11333113, 11333173.

PC1 - preparation complement:

11111111, 11111181, 11151112, 11151181, 11711111, 11711181.

PC2 - preparation complement:

11641411, 11641481, 11641511, 11641581, 11051714, 11051784, 11641111, 11641119,
 11641181, 11641189, 11641211, 11641281, 11641512, 11641582, 11641611, 11641612,
 11641613, 11641614, 11641615, 11641681, 11641682, 11641683, 11641684, 11641685,
 11641711, 11641781, 11641811, 11641881, 11641911, 11641981, 11642111, 11642112,
 11642181, 11642182, 11642311, 11642381, 11642411, 11642412, 11642481, 11642482,
 11649911, 11649912, 11649914, 11649915, 11649917, 11649981, 11649982, 11649984,
 11649985, 11649986, 11672312, 11672382, 11641311, 11641381.

PD - preparation dessert:

11649919, 11649988, 11141312, 11141372.

SEMI-PREPARATION MEALS

SPB - semi-preparation basic:

11311211, 11311271, 11312211, 11312271, 11312281, 11313114, 11313119, 11313173, 11313179, 11313189.

SPC1 - semi-preparation complement:

11731111, 11721271, 11731211, 11721111, 11721181, 11732211, 11732281.

SPC2 - semi-preparation complement:

11661171, 11661271, 11661671, 11661673, 11661674, 11661675, 11661771, 11661971, 11662171, 11662172, 11662471, 11662472, 11669972, 11671111, 11671112, 11671113, 11671114, 11671115, 11671181, 11671211, 11671311, 11671381, 11671411, 11671419, 11671481, 11671511.

SPD - semi-preparation dessert:

11631112, 11631113, 11631114, 11631119, 11631181, 11631212, 11631281, 11631311, 11631312, 11631381.

FAST MEALS

FB - fast basic:

11121218, 11272411, 11272481, 11272611, 11333115, 11333119, 11333175, 11333179, 11333185, 11674111, 11674113, 11674171, 11674181, 11675119, 11279914, 11279915, 11279916, 11279971, 11279976, 11279977, 11279981.

FD - fast dessert:

11111112, 11011311, 11011371, 11052113, 11052171, 11633111.

ACCESSORY STUFFS

AS1 - fats:

11511111, 11511181, 11431111, 11431112, 11431182, 11431181, 11511211, 11521112, 11531111, 11531112, 11541111, 11541181, 11053111, 11053181, 11053211, 11053281.

AS2 - spices:

11051111, 11051112, 11051211, 11051212, 11051213, 11051219.

AS3 - other:

11271711, 11271781, 11671611, 11671681, 11671711, 11671712, 11671781, 11661371,
11672311, 11631115, 11051411, 11051511, 11051581, 11054113, 11051711, 11051611,
11051612, 11051713, 11051783, 11052112, 11052111, 11051512, 11054114, 11054112,
11121113, 11121114, 11121212, 11121219, 11611411, 11611481, 11621112, 11622113,
11622114, 11011113, 11632313, 11811111, 11811112, 11811181.

ASRM - accessory stuffs ready-made:

11051712, 11051771, 11051782.

MEALS OUT**MO1 - meals out, bar:**

83111111, 83111112, 83111113, 83111114, 83111115, 83111116, 83111117, 83111118.

MO2 - meals out, restaurant:

83111119, 83111198, 83111199, 83211131.

PREPARATION LUNCH/BREAKFAST**PLB1 - preparation lunch & breakfast:**

11051214, 11052211, 11052212, 11121111, 11121112, 11121115, 11121116, 11121117,
11121181, 11141112, 11141172.

PLB2 - preparation lunch & breakfast:

11451111, 11451181, 11521111, 11521181, 11521211, 11521212, 11521281, 11011111,
11011189, 11012111, 11012112, 11012181, 11121211, 11131311, 11261111, 11261211,
11261213, 11261271, 11261273, 11261281, 11262111, 11262112, 11262171, 11262172,
11262182, 11262211, 11262281, 11262311, 11262371, 11262381, 11262411, 11262471,
11262481, 11262511, 11262581, 11262611, 11262681, 11262711, 11262712, 11262781,
11262782, 11262811, 11262871, 11262911, 11262981, 11263111, 11263171, 11263181,
11269919, 11269979, 11269989, 11271811, 11271812, 11271819, 11271881, 11271882,
11272311, 11311113, 11311173, 11321111, 11321212, 11321311, 11321381, 11331111,
11331211, 11331212, 11331213, 11331281, 11331311, 11331312, 11341171, 11331381,
11331411, 11331419, 11331481, 11332111, 11332112, 11332211, 11332212, 11332281,
11332282, 11332311, 11332312, 11332319, 11333111, 11333112, 11333171, 11333172,
11341111, 11341181, 11441111, 11441112, 11441119, 11442111, 11442112, 11442171,
11443111, 11443181, 11443211, 11611814, 11621113, 11641112, 11641182, 11642211,
11642281, 11649913, 11649983, 11662271, 11669971, 11672211, 11672212, 11672213,
11672214, 11672219, 11672282.

SEMI-PREPARATION LUNCH/BREAKFAST**SPLB1 - semi-preparation lunch & breakfast:**

11131111, 11131171, 11131211, 11131281, 11131411, 11131471, 11131481, 11131511, 11131571, 11131581, 11131611, 11131671, 11131681, 11131711, 11131771, 11131781, 11132112, 11132111, 11132181.

SPLB2 - semi-preparation lunch & breakfast:

11161111, 11161181, 11432111, 11432211, 11432281.

FAST LUNCH/BREAKFAST**FLBMO - fast lunch & breakfast, meals out:**

11141113, 11273111, 11273112, 11279911, 11333116.

SNACKS**SN1 - fast:**

11041111, 11041171, 11041181, 11141111, 11141171, 11141181, 11141211, 11141212, 11141272, 11141282, 11141311, 11141371, 11141381, 11141382, 11142111, 11142181, 11142211, 11142281, 11142311, 11142381, 11162111, 11271511, 11811113, 11011112, 11031611, 11021111, 11021119, 11021181, 11031111, 11031211, 11031281, 11051311, 11051312, 11051381.

SN2 - fruit:

11611111, 11611112, 11611181, 11611182, 11611211, 11611281, 11611311, 11611312, 11611382, 11611511, 11611611, 11611711, 11611811, 11611812, 11611815, 11611818, 11611813, 11611872, 11611883, 11611819, 11611873, 11611881, 11611882, 11611884, 11611889, 11649918, 11649987, 11621111, 11621182, 11621211, 11622111, 11622112.

NON-CONVENIENT BEVERAGES**NCB1 - non-convenient non-alcoholic beverages:**

11911111, 11911181, 11911211, 11921111, 11921112, 11921181, 11921182, 11931111, 11931112, 11431211, 11431281.

NCB2 - non-convenient alcoholic beverages:

11054115.

CONVENIENT BEVERAGES**CB1 - convenient non-alcoholic beverages:**

11411111, 11411181, 11411211, 11411281, 11411311, 11411411, 11411481, 11433111, 11632112, 11632211, 11632213, 11632311, 11632312, 11632314, 11632319, 11632371, 11632381, 11632382, 11632383, 11632384, 11673111, 11673119, 12111111, 12111119, 12111181, 12121111, 12121112, 12121113, 12121181, 12121182, 12121183.

CB2 - convenient alcoholic beverages:

13111111, 13111112, 13111113, 13111181, 13111182, 13111211, 13111311, 13111411, 13111412, 13111511, 13111619, 13121111, 13121119, 13121181, 13121211, 13121919, 13122211, 13122219, 13122311, 13122411, 13122412, 13122511, 13131111, 13131112, 13131113, 13131114, 13131115, 13131119, 13131181, 13131183, 13131211, 13131212, 13131282.

BEVERAGES OUT**BO1 - beverages out, bar:**

83111410, 83111419.

BO2 - beverages out, restaurant:

83111121, 83111141, 83111151, 83111159, 83111161, 83111171, 83111172, 83111173, 83111179.

BO3 - beverages out, canteen:

11411114, 11411117, 11949911, 11949912, 12111129, 12121115, 13121911, 13131116, 13131117, 13131213.

Appendix 2

EQUIVALENT SCALES

An equivalent scale expresses differences in income, which results in the same level of welfare for different types of families, and the same for equivalent differences in consumption of a commodity, which yields the same level of welfare for different types of families in consuming that commodity.

Formalized, the income, Y_0 , which is necessary to achieve a certain level of welfare, u_0 , depends on the market prices, p , and family type, a_0 ,

$$Y_0 = c(u_0, p, a_0),$$

where c is the function determining the required living costs at that particular level of welfare. Similarly, the living costs necessary to achieve the same welfare level, u_0 , by the prices, p , for family type, a_1 , may be specified as

$$Y_1 = c(u_0, p, a_1),$$

whereby the relationship between Y_0 and Y_1 ,

$$Y_1/Y_0 = c(u_0, p, a_1)/c(u_0, p, a_0)$$

is the equivalent scale, i.e. the relationship between the living costs necessary to achieve the same level of welfare for two different types of families at the same market prices.

In finding equivalent scales we operationalize two different methods based on implicit weights and explicit weights, respectively. We assume that the families are on the same market, which is why the price levels does not vary.

A. The *explicit weights* are normative in the way that we use kilojoule-recommendations multiplied by the prices of the required foodstuffs.

The Consumer Agency of Denmark (1992) publishes the daily required nutrition intake (kJ) for individuals, adults and children, men and women, separated in different age-groups, i.e. a nutritional scale. The prices of the foodstuffs are found, and the expenditures are the product of the prices and the quantities for each individual. However, the findings exercising this procedure are exclusive economies of scale, and the method is only mentioned to illustrate an alternative approach, not to find an adequate equivalent scale for this research work.

B. The *implicit weights* are estimated by the observed differences in consumption patterns for households of varying sizes and composition. This procedure based on Expenditure Budget data allows us to find the economies of scale, as opposed to the weight found by the normative method.

The *food expenditure* is the dependent variable and the number of adults (COUPLES) and children (CHILD), youngest child under 7 years (CHILDPR) and youngest child between 7 and 16 years (CHILDSC) are predictors in regression analyses. The coefficients found are divided by the value of the constant term, which gives the implicit weights,

$$\text{UNITAALF} = 1.00^a + 0.72^a * \text{COUPLES} + 0.23^a * \text{CHILD} + -0.04 * \text{CHILDPR} + 0.18^c * \text{CHILDSC},$$

where ^{a,b,c} indicates, that the coefficient in the regressions behind are significant on 0.001, 0.01 and 0.05-levels, respectively.

Similarly, the estimated implicit weights for *home meals* are,

$$\text{UNITH} = 1.00^a + 0.87^a * \text{COUPLES} + 0.29^a * \text{CHILD} + -0.11 * \text{CHILDPR} + 0.23^c * \text{CHILDSC}.$$

To find the economies of scale based on the number of children, we included the variable, child*child. However, these models explained nearly the same as without that variable (adj.R² = 0.289 vs. 0.290 and 0.295 vs. 0.296), and furthermore the t-values were extremely low, and CHILD and CHILDSC became insignificant.

For disposable income we have estimated equivalent scales for all expenditures (DISPINC) and all variable expenditures (VARINC), whereby we have the implicit weights

$$\text{UNITC} = 1.00^a + 0.99^a * \text{COUPLES} + 0.07 * \text{CHILD} + 0.29^b * \text{CHILDPR} + 0.37^a * \text{CHILDSC}.$$

$$\text{UNITCC} = 1.00^a + 0.89^a * \text{COUPLES} + 0.07 * \text{CHILD} + 0.20^c * \text{CHILDPR} + 0.32^b * \text{CHILDSC}.$$

We have also estimated equivalent scales for every expenditure category, which were then weighted together by their relative share of the average households total expenditures, see table 9 in chapter 5. As above, the coefficients in every estimation are divided by the value of the constant term,

$$\text{UNITAGG} = 1.00 + 1.02 * \text{COUPLES} + 0.06 * \text{CHILD} + 0.32 * \text{CHILDPR} + 0.39 * \text{CHILDSC}.$$

The implicit weights for every expenditure category regression represent a substitution effect, and the "weighted" implicit weights, above, an income effect, where the first effect is anticipated to dominate for children goods and the second for adult goods. Comparing the implicit weights for food expenditures and the "weighted" total implicit weights indicates, that the substitution effect is surprisingly low for food compared to other household expenditures.

The MAPP programme consists of the following 15 projects

1. Strategic Planning and Innovation Capability in the Danish Food Sector
Morten Kvistgaard & Kirsten Plichta, Copenhagen Business School, Ole Rasmussen, Biotechnological Institute
2. Innovation Capability as a Key Success Factor
John Kjeldsen & Hanne Harmsen, The Aarhus School of Business
3. Flexible Manufacturing in the Danish Food-Processing Industry - How to Integrate Management, Marketing and Technology
John Kjeldsen, The Aarhus School of Business
4. Definition of the Sales Potential for a New Food Product to be Launched on Home or Foreign Markets
Anne Martensen & Lorentz Andersen, Copenhagen Business School
5. Primary Producers and Product Innovation in the Food Industry
Villy Søgaard, University Centre of South Jutland
6. Controlling Processes of Production to Guarantee Process Characteristics Demanded by Consumers of Food Products: Paradigms and Danish Experiences
Esben Sloth-Andersen, Aalborg University Centre
7. The Role of the Distribution System in Product Innovation
Hanne Hartvig Larsen & Lasse Henningsen, Copenhagen Business School
8. Prototyping in the Danish Food Industry
Preben Sander Kristensen, Aalborg University Centre
9. Product Quality and Consumer Preferences: Assessing the Optimum Design of Food Products
Kai Kristensen & Hans Jørn Juhl, The Aarhus School of Business and Carsten Stig Poulsen, Aalborg University Centre
10. Product Innovation and Packaging in the Food Industry - Environmental Consequences and Consumer Reactions
John Thøgersen & Tino Bech-Larsen, The Aarhus School of Business
11. The Consumer as Agent in Relation to Research and Development in Food Technology
Erling Jelsøe, Birgit Land & Jesper Lassen, Roskilde University Centre
12. Households' Choice of Foodstuffs with Different Kinds of Preparation
Jens Bonke, University of Copenhagen
13. The Cultural Dimensions of Food Consumption and the Implications for Strategy Formation and Implementation in Small and Medium-sized Danish Companies
Dominique Bouchet, Søren Askegaard, Tage Koed Madsen & Per Østergaard, Odense University
14. Market Surveillance Systems for the Food Sector
Klaus G. Grunert & Karen Brunsø, The Aarhus School of Business
15. Identification of Key Success Factor
Klaus G. Grunert & Charlotte Ellegaard, The Aarhus School of Business