



Assessing Eating Patterns—an Emerging Research Topic in Nutritional Sciences: Introduction to the Symposium

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In order to stimulate food habit research in nutritional sciences, in 1994 the International Union of Nutritional Sciences (IUNS) established Committee II/2 on Nutrition and Food Habits, which has the charge “to review the impact of changing food choice and habits on nutritional status”.

Within this broad task, priority has been given to methodological aspects of studies on the spatio-temporal structure of food and drink intake. Some principles of the study of eating patterns and the status of this research topic nutrition are described as an introduction to selected papers of a workshop on “Methodology to Identify and to Assess Eating Patterns” organized by the IUNS committee and held during the 16th International Congress of Nutrition in Montreal (Canada) on 28 July 1997. © 1999 Academic Press

WHY IS THERE A NEED TO STUDY EATING PATTERNS?

Daily intakes of Nutrients and Foods remain at the focus of current human nutrition research, despite of the awareness in public health nutrition of the potential to prevent nutrition-related diseases by adopting healthy lifestyles and food habits (James, 1988). Current dietary advice is no longer based exclusively on nutrients (e.g. as recommended dietary allowances), and yet the dietary goals are translated into food-based guides, such as the U.S. food pyramid (e.g. USDA, 1992). The consumers themselves have to translate this advice on foods into their everyday eating habits and activities.

Nutrition research therefore should be re-focused on food habits, which include food procurement, storage, preparation, eating and disposal. Food habits are structured, e.g. into eating occasions, such as meals or snacks. Diet studies reveal different

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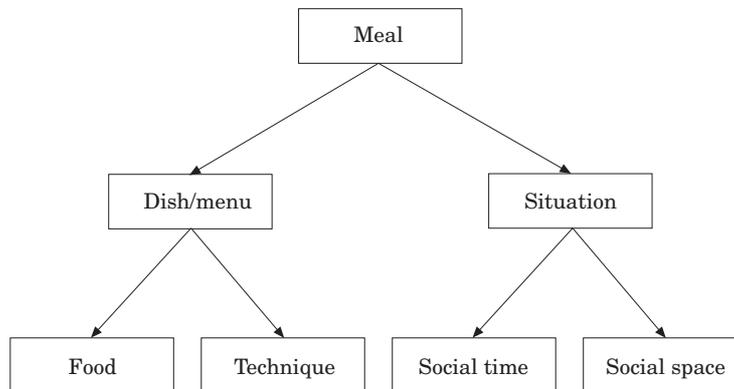


FIGURE 1. Dimensions of a meal (after Tolksdorf, 1976).

physiological reactions when isolated nutrients, single foods or complete meals are ingested as well as when the distribution of the food ingestion over a time period follows different patterns, e.g. nibbling vs. binge eating. Unfortunately, mainstream nutrition epidemiology until very recently mainly neglected the interrelationships between different food habits (e.g. different eating patterns) and human health. Considering the relative lack of scientific evidence and food habits, it is important to stimulate such research in nutritional sciences. In 1994, the IUNS established the committee II/2 “Nutrition and Food Habits”, which has the charge “to review the impact of changing food choice and habits on nutritional status.”

The broad task of the committee was discussed during a workshop on “Impact of Changing Food Choices and Eating Habits on Nutritional Status in European Countries” (Oltersdorf, 1996). It was agreed that the priority should be given to methodological aspects of studies on the spatio-temporal structure of food and drink intake—in other words, on eating patterns. Only by the development of appropriate methods for identifying and assessing eating patterns could the effects of different food consumption patterns on health and nutritional status be investigated.

Current experiences in the “Methodology to Identify and to Assess Eating Patterns” were gathered in a workshop on this topic within the 16th International Congress in Nutrition in Montreal (Canada) (28 July 1997). Selected papers of workshop participants are presented in this issue, supplemented by some invited papers, to provide an overview of the current status of this research area. Research on eating patterns is also actively pursued by other groups (Aymard *et al.*, 1996; Gibney *et al.*, 1997).

PRINCIPLES TO STUDY EATING PATTERNS

Food habits belong to the essential activities of humans and are part of one’s lifestyle. Everyday activities are structured in behaviour units and standing patterns of behaviour (Barker *et al.*, 1978). The structures of food habits have been described in several ethnological investigations. As stated by Douglas (1972), “Eating is, like talking, patterned activity,” and “Each meal is a structured social event which structures others in its own image.” We know that people of different cultures have

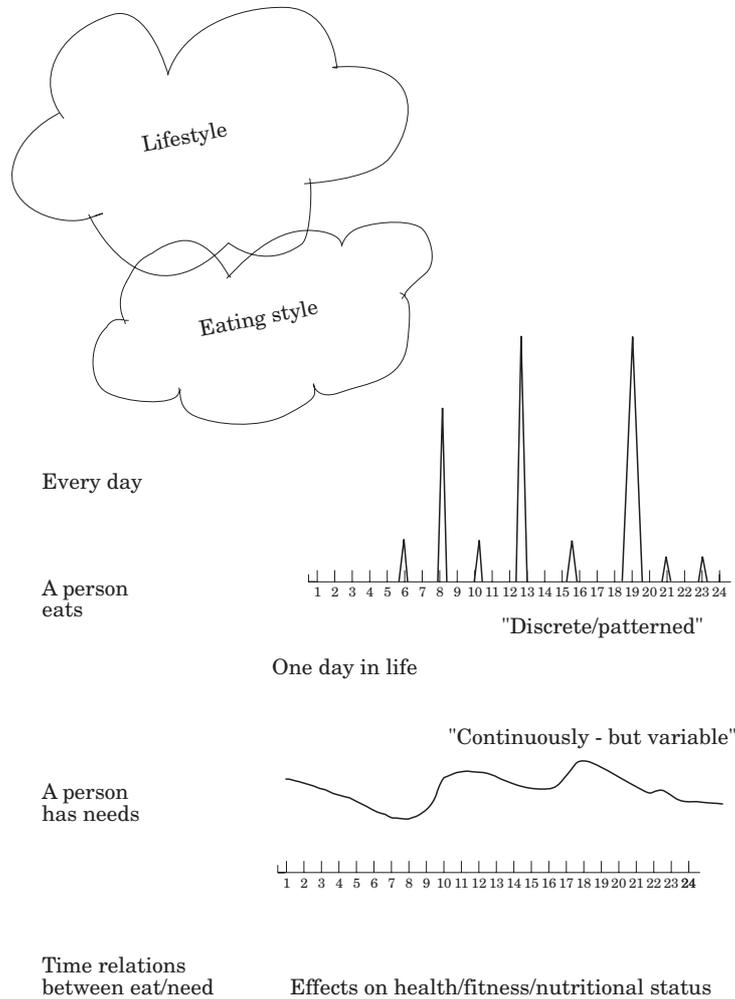


FIGURE 2. Pattern of food habits related to the “stream of life”.

different eating patterns, but the methods to “assess and identify” such patterns have not yet been developed in nutrition research. So we are unable to understand the “eating language”.

Nevertheless, some worthwhile experience has been gained in ethno-cultural food habit research. In Germany, Tolksdorf (1976) and Wiegmann (1986) stressed the importance of the meal as a central construct with various dimensions (Fig. 1). This definition of a meal includes both the material aspects (the foods) and its immaterial ones (the social situation of eating). In Finland, Prättälä (1990) describes a meal as a planned social interaction centred on food.

These characteristics of food habits, being patterned (related to the “stream of time”) (Fig. 2) and socio-culturally based, have to be considered in the methods to identify and to analyse eating patterns. Moreover the impact of circadian rhythms has to be studied. Such investigations on eating patterns will thus have to include

TABLE 1
Criteria for the definition of a meal

Criteria	Meal defined as	Author
Time of consumption	Eating events in the morning, at midday and in the evening	Fabry <i>et al.</i> , 1964 and others
Energy content	Consumption of >375 kcal	Bernstein <i>et al.</i> , 1981
Social interaction	Presence of fellow eaters	Rotenberg, 1981
Food quality	More than one single food	Skinner <i>et al.</i> , 1985
Energy content + interval time since last eating event	210 or 420 or 840 kJ + 15' or 45' interval time	de Castro, 1993
No predefined concept	Self reported by subject	Gatenby, 1997

data which are usually not objects of the analysis of dietary surveys. The scientific challenge is to investigate such general statements.

Following the variables summarized in Fig. 1 a tentative checklist for *assessment* of eating patterns can be listed:

- In order to describe “the menu” it is important to know the number, the order and the format of the different courses.
- Food should be assessed not only from the point of view of quantity and nutrient content but also with regard to sequence and combinations of the different items.
- The “technique of preparation” includes food preparation and methods of cooking (e.g. boiled, grilled, smoked, etc.).
- “Social time” means time devoted to preparation of the meals, the meals themselves and the time of intervals between the eating occasions (e.g. time budget surveys).
- “Social situation” is the scene where eating takes place (e.g. eating alone at home in the kitchen, out-door in the canteen, etc.).
- “Social space” refers to fellow-eaters—gender, age, the degree of familiarity and the degree of dependency should be surveyed.

Such comprehensive data records will have to be *analysed* for eating patterns. To date, there is no general agreement on *definitions* to categorize the different eating occasions, like meal or snack. Several suggestions have been made to define meals and snacks (Table 1) according to hour of the day, amount of intake, presence or absence of fellow eaters, quality of food or a combination of size and interval. There is, however, a more recent tendency to use the term “eating event” and to have the subjects decide by themselves whether they consider to eat a meal or a snack. Further possible aspects to structure the eating occasions are related to sensoric characteristics of the food intake (taste, smell, colour, texture) and cultural characteristics of foods (manner, cultural value, religious rules, etc.).

The investigations on eating patterns could also use combinations of the above mentioned dimensions to build a kind of “type” or “Gestalt” of an eating pattern, e.g. a typical “weekly menu card” as has been done by ethnographic studies of stable traditional societies. The type or Gestalt could be indicated possibly by certain

typical meals, e.g. pasta or kraut. Beside hypothesis guided statistical analysis also explorative data analysis (“data mining”) should be employed for these purposes.

“STATE OF THE ART” IN EATING PATTERN RESEARCH

The contributions presented in this issue of this journal present selected examples of the research on eating patterns. Showing good initial efforts in a new research area, and the broad range of possible methods.

The contribution of Barry Popkin and his research group (p. 8) developed a diet quality index for analysing 7-day-dietary records, which compares frequencies of consumption of food groups with the frequencies given in dietary goals, but the distribution of eating occasions within the week is not considered.

Several groups use definitions of meals, which are based on the culture and the tradition of the studied population. The frequency and socio-cultural interrelationship of certain types of breakfast, lunch and dinners (e.g. cooked vs. bread meal) are described: for elderly in Europe (Schlettwein-Gsell *et al.*, p. 15), for migrant populations in Australia (Wahlqvist *et al.*, p. 23), for middle-aged men (Winkler *et al.*, p. 33) and elderly (Pfau, p. 38) in Southern Germany.

Meals are classified according to energy and nutrient densities (Bellisle *et al.*, p. 46; Lennernäs, p. 53). Bellisle *et al.* also introduce the time span between meals. The important experiences of de Castro (1998) are used, showing how one meal influences the following one. The balance and compensation of different food intakes are not occurring immediately, but apparently in a period of several days.

Experiences with qualitative interviews for the assessment of meal patterns compared to other methods are described by Prättälä and Roos (p. 66). Similar emphasis on social and cultural aspects of eating are given in the computer assisted telephone interviews on nordic meals described by Mäkelä *et al.* (p. 73). The analyses of the information for eating patterns follows an eating system with a three-dimensional model: the time rhythm, the meal composition and the social setting of the eating situation.

Booth (p. 80) describes and compares the eating patterns observed in persons who have successfully reduced their body weight and kept slim, with those of the unsuccessful dieters.

In further papers there is information given on eating patterns in Poland (Kowrygo *et al.*, p. 86), and the potential and the difficulties of investigating eating patterns in East African societies (Oniang’o & Kimotoki, p. 93). A supplementing investigation of this topic on meal patterns in China is published elsewhere (Ge *et al.*, 1997).

Apparently no research groups have investigated the aspects of sensoric characteristics of food and dishes in connection with eating patterns. There also seems to be a lack of more holistic and cultural approaches. Prättälä *et al.* and Mäkelä *et al.* describe the importance for that, and there is a good tradition for this ethnographic-related research in Scandinavia. Such entities (“Gestalt” or “cuisines”) should be identified more intensively.

A small survey amongst the 67 members of the IUNS (in 1997 in conjunction with the above mentioned workshop in Montreal) indicated the many gaps in this research area, but also encouraged research on eating patterns. Answers arrived from 21 member countries (Benin, China, Czechia, Finland, Gambia, Germany, Greece, Hong Kong, Iceland, India, Japan, Kuwait, Lebanon, New Zealand, Phil-

ippines, Poland, Saudi Arabia, South Africa, Switzerland, the U.K. and the U.S.A.). The great geographical range justifies a discussion of these answers in spite of their small number.

Representatives had been asked firstly whether the dietary guidelines of their countries include recommendations on meal patterns. According to their answers, in five countries only are there meal-based recommendations. In Germany, more frequent but smaller meals are recommended. In Poland, variety and regularity of meals is referred to, and in Greece, the Mediterranean diet pyramid is presented. No further information (beside the answer "yes") was given the U.S.A. and Japan.

A second question related to meal patterns in the different countries. The representatives were asked to describe the kind of meals they would expect during a non-luxurious seminar in their country, and to give information on meal patterns in military schools and prisons. Answers are available from 18 countries; from nine for all three situations, from three for two and from six countries for only one of the three given situations. It is worth noting that within countries the patterns were the same for the three requested situations, with only minor differences with respect to desserts or coffee. Between countries distinct differences could be shown especially with respect to cooked meals.

A cooked meal at lunch time is the rule in Germany, Switzerland, Poland and Czechia—in other words in central and eastern Europe. From other studies (Schlettwein-Gsell *et al.*, p. 15) we know that this is also the case in southern European countries. A cooked meal at dinner time seems common in Finland, U.K., U.S.A., South Africa, New Zealand and Japan. A cooked meal both at lunch and dinner is common in Benin, China, Gambia, Hong Kong, Iceland, Kuwait and Lebanon; in many of these countries traditional eating patterns are strongly influenced by modern westernized diets.

Studies of the socio-cultural and historical development indicate a two-cooked meal system in traditional native and medieval European societies, whereas in modern westernized populations a daily one-cooked meal pattern is prevalent (Mennell, 1985; Sandgruber, 1988; Vorster, 1997).

World-wide there still seem to be plenty of "traditional cultures of eating patterns", but internationally there are modern ones, such as "fast foods with burgers and pizzas" penetrating into populations. A "mapping" of such information on a time scale, showing stable traditional eating patterns vs. new ones, would be very valuable for nutrition research. Better knowledge of these situations would offer great opportunities for studying the health and nutrition effects of daily experiments in humans with the methods of nutrition epidemiology eating.

It is hoped that the approaches presented here to evaluate the methodology and to assess and identify eating patterns will encourage more colleagues to support this vast new area of nutrition research.

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