

Exploring the meal concept – an interdisciplinary literature overview

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Key words: Meal, food science, nutrition, health, food culture

Introduction

The meal concept is used in varying contexts, and within several scientific fields, however often without a clear definition of what it includes. The meal has been identified as a subject in a multiple of research areas such as nutrition, medicine, sensory science, history, design product development, food service, biology, physiology, anthropology, sociology, psychology, marketing and so forth (1). A meal may be defined and identified by the time of the day, by its energy content and how the food is combined as well as by its social interactions, implying that it may be understood in relation to the food itself as well as to the social and cultural context (2). The meal has also been discussed in relation to the concept of “snacks”, where a meal has been defined as a “structured food event”, while “snacks” represent “unstructured food events” (3). Some attempts have been made in order to define the meal and also to present a more holistic model of what it includes. One way of defining the meal is by using certain cues related to food as well as the environment (4). Another example is the Five Aspects Meal Model (FAMM) which was developed as a model in the early 2000s (5), with the ambition to capture an entirety of the meal by including the room, the meeting, the product, the logistics and the atmosphere in defining and understanding a meal. Although there have been many attempts trying to find a general and precise definition, the complexity makes it difficult, and maybe impossible, to capture the meal concept in a single definition (6). Different disciplines focus on various aspects, which may complicate a common understanding (7, 8, 9).

It has been stated that meals are only one form of eating (10), and that the meal alone does not capture the diversity of today's eating. Still, it is recurrently used as a point of reference and as a norm for discussions concerning food and eating. The meal concept is however in constant change and must be understood in relation to societal patterns and norms, how we organize our eating and what role food plays as a social and cultural glue (2), but also in relation to our perception of health, sustainability, convenience and so forth. Other concepts, such as “eating episodes” (11, 12), “eating occasions” see f ex. (12) and “eating events” (14) have also been used as attempts to illuminate the complexity of food habits. Nonetheless, the meal is still universally used and recurrent in various research works, and therefore it is of importance to investigate *how* the concept is actually used and understood in the different areas related to food- and meal science, an interdisciplinary field studying food and meals within *Food science, Nutrition and health*, and *Food culture and communication* (for further explanation on these areas, see (15)).

Purpose

The purpose is to explore how the meal concept can be used and understood within three areas identified within food- and meal science.

Method

This literature overview focuses on highlighting the meal concept from different areas. Relevant scientific databases have been searched for English peer-reviewed articles and reviews published 2004-2014. Primarily, articles which deal with the meal as a main subject have been included and assessed for relevance. The main search term “meal(s)” has been combined with several other search terms significant within the different areas *food science, nutrition and health* and *food culture and communication*. The search terms combined with “meal” were “sensory”, “chewing”, “physical properties”, “chemistry”, “food production”, “engineering”, “unit operation”, “culture”, “communication” and “social”. Furthermore, within the field of nutrition and health the mesh-term “meals” was used.

The limitations of the study are the demarcation of scientific areas and furthermore the samples of articles that are examined. It means that this paper does not aim to give a complete overview of how the term meal is used and understood and in what context it appears.

Due to the limited space available, references of literature from the overview have *not* been included in the result of this extended abstract. A full list of references for each area is available at <http://www.hkr.se/extrareferences>.

Results

The results will be presented from the three identified areas of food and meal science, focusing on how the meal concept can be used and understood within these areas.

The meal from a food science perspective

In contemporary food science and food technology literature the meal concept is generally not well defined, however, it is frequently analyzed as a functional unit. The scientific interest is often directed towards the meal as a carrier of different nutrients and its effect on health but also other effects of meals are measured, like the hedonic or environmental impact. In the later types of studies mentioned, a more holistic view of the meal concept may be given space. As an exception of the lack of a defined meal concept in this area, the term “test-meal” can be put forward as a well-defined term in terms of composition and size.

Within sensory science, as an example, a majority of the scientific publications investigated for this paper concerns single food items and their sensory properties, such as the importance of colour, appearance, texture, taste, odour and flavor. None the less, a number of studies considers meals and dishes as a whole entity and research is slowly starting to move away from the traditional focus on single foods, devoting more attention to meals. A meal is often described either by meal components, meal size, or nutrient and energy content. Combinations of these factors are common. The composition of the meal may be chosen on basis of frequently consumed ingredients or put together to fulfill nutritional recommendations. Furthermore, meals generally include several food components put together in a package (for example in forming a ready-to-eat meal) or on a plate. Studying

food processing from a Life Cycle Analysis perspective may also include a focus on sustainability of entire meals as compared to single foods. In this sense, foods become a meal when several food components are put together. Drinks and an apple on the sides are not seen as integrate parts of the meal but as something served with the meal. Furthermore, the timing of the eating event may be as important as the actual food item consumed, in defining whether it is a meal or not.

The meal from a nutrition and health perspective

A main finding from a health and nutrition perspective is that the meal concept often occurs as an extra rather than as a main character. In the literature focusing on nutrition and meal from a medical perspective, the meal is often used without reflection, understood as food prepared to eat. The meal is often present as a part of the methods e.g. standardized or manipulated as test-meal. In some studies, *meal* is a descriptive variable among several others e.g. in studies examine how patients experience their hospital stay and hospitals meals as part of the experience. Furthermore, the study design also varies in the articles, including medical diagnoses where e.g. diabetes and obesity issues are present. Few studies have a qualitative design.

In the literature searched within nutrition and health from a broader perspective, the meal concept is used in various contexts often focusing on specific consumer groups, such as children at school and elderly in nursing homes. In these studies, a meal is presented as a requirement for providing a certain amount of energy and nutrition compared to the guidelines and they are often described as regular/main meals and between-meal snacks eaten at a certain time of the day. Public meals, e.g. school meals and community meals, are described in terms of nutrition quality, amount of food consumed or in relation to policy documents. Additionally, in studies related to hospital and institutional meals, meals are described where patients/people are in need for assistance.

Meals from a nutritional point of view are often focused on a balanced diet in relation to dietary guidelines and specific health outcomes, a specific nutrition component, food, texture or some kind of disability or medical reason. Meals are also described and used in relation to socioeconomic and lifestyle factors, academic and behavioral outcomes as well as cooking skills in relation to healthy meals at home.

The meal from a food culture and communicative perspective

In this area, focus often is on the meal as a social glue, strongly connected to identity and fellowship. Here, the meal can be seen as an identity-building process for the individual, but also for group of people. Meals are often used as symbols and may be a way of showing inclusion as well as exclusion. Furthermore, the meal is used as a way to perpetuate traditions and remember different events in a collective memory. It becomes a ritual behavior where food is loaded with memories, tradition and custom. The meal is also used as an example to discover a country's culture or people's religious beliefs. Meals function as a marker of social frontier, involving issues of class, gender, race and ethnicity.

In many articles, “a proper meal” and “a family meal” are recurrent, often related to meals at home and the domestic sphere. These have been described in terms of patterns and frequencies, as well as what, where, when and with whom the meal should take place. The proper meal, as well as the family meal, are most often used normatively, focusing on a somewhat idealized version of the meal. A proper meal has been used in terms of identification and identity work, as a way of positioning oneself, but also as a symbol of

caring. In the same way, the family meal has been used in terms of being a cultural icon, a cultural ideal, and an event with ritualistic elements. Moreover, the family meal has also been identified as an argumentative arena, where opinions regarding good and bad food, how much to eat etcetera, are put forward. Expressions such as the family meal as a “battlefield” or a “scene” for parents and children” have also been noted, an arena for disappointments and conflicts where power, age and gender becomes visible.

Meals have also been studied outside the domestic sphere, although there seems to be no consensus on what meals in this area should be called. Some use the term institutional meals referring to meals in hospitals or prisons that serve the purpose of feeding and which also have the association of accentuating the difference from home. Others use the term public meals when dealing with meals in schools or in hospitals, or a combination of these when studying the foodservice industry: “public or welfare/institutional sector”. It is possible to identify two different assumptions underlying how the concept of meal is used. One could be called “meals as nutrition”, meaning that meals are spoken about primarily as a source of nutrients, as the act of feeding, or as something measurable. The other, and seemingly more common use, could be called “meals as experiences”. Here, meals are assumed to include social aspects which merits studies of children in pre-school, students in school, patients in hospitals, inmates at prisons or consumers in general. Meals as experiences encompass the whole meal situation, from the food on the plate, the company at the table (or lack thereof) to conversations held while eating and subjective thoughts of the meal.

Discussion

The aim of this paper was to explore how the meal concept is used and understood in three different scientific areas within the interdisciplinary field of food- and meal science. The understanding of the meal concept varies depending on scientific discipline but also within the same discipline with relation to research question and type of design. Depending on the perspective, some eating occasions may be viewed as meals while others are not (1, 16).

Some major findings are made from this overview: The disparities but also the similarities in the use of the meal concept within the scientific areas show that the concept is most often used without reflecting on it, as if it was part of “common sense” knowledge. Within the fields of *food science and food technology* as well as *nutrition and health*, the meal is often used as a very simple concept which means food intended to be consumed for a certain purpose (17-19). Food production and meals are seldom inter-connected in the literature. However, with an emerging research field dealing with the environmental impact of food production through the use of life-cycle assessment, there is a more obvious link to the ultimate functional unit, the entire meal e.g. (20). In the field of *food culture and communication*, representing a social and cultural perspective, the concept is much more elaborated on and filled with various meanings and understandings. Here, the meal is most often viewed as a social situation and a cultural expression (21), but also as an experience (22). Even though several definitions of the meal have been presented within this area, there are still ambiguities in how the concept is or should be used, as has also been specified in earlier research. For example, the lack of a common definition of a family meal has been stated (23, 24) and “a family dinner” (dinner practices) (25) and “a family dinner table” are in some instances used more or less simultaneously to “a family meal” see f ex (26), making it difficult to distinguish between a dinner and a meal. Moreover, meal and food are sometimes used interchangeably e.g. (24, 27). ‘Food’ may be used to describe something

prepared, produced, served and provided while ‘meal’ is connected to a specific time and an experience e.g. (28).

In summarizing, the meal may consist of solely the food on one hand, and on the other hand it may include a multiple of aspects, as has been described by e.g. (2, 5) or (1, 7, 8). Interestingly, the meal often appears as *a tool* in order to analyze something else, it may be the effect of the intake of certain nutrients that are to be measured, sensory analysis focusing on for example taste and smell, or the meal as an expression of identity, traditions and cultural belongings, but also gender, class and power. The meal has been described as a “slippery concept” in expressing the complex nature of the meal, and maybe this is one reason why it seems so difficult to capture it (2).

Despite the demarcation in this overview, the concept must also be put in a historical perspective. In the transition from hunter gatherers over agricultural and industrial into a post-industrial society, e.g. the relationship between and the distribution of tasks between sexes, health status in the population and technical conditions for storing and preparing food have changed dramatically. The meal has made a journey from campfire to fast food and public meals in an obesogenic and multicultural society. Within the field of food- and meal science it is important to understand how societal changes influence the concept. The challenge and great opportunity for food- and meal science is to gather and grasp such an understanding in order to contribute to an interdisciplinary understanding and development of the concept.

Conclusion

The meal concept is commonly used within all the areas of food and meal science, however described and understood differently. In food science and technology as well as in health and nutrition the meal is most often used without reflecting on its meaning and significance, and is often used as a tool for studying something else. In the area of food culture and communication, the meal is most often viewed as a social situation and a cultural expression used with great variety of definitions, meanings and understandings. However, also within this area the meal often serves as a tool for analyzing something else. Food and meal science as an interdisciplinary field has a great opportunity to combine and use all the different aspects in order to form a more holistic view of the meal concept.

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The reference list in this extended abstract only includes literature used in the introduction and in the discussion. A complete list of the literature used in the result are provided at <http://www.hkr.se/extrareferences>.

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