Culinary arts and meal science – a new scientific research discipline*

Inga-Britt Gustafsson
Department of Restaurant and Culinary Arts, Örebro University, Sörälsgvägen 2, 712 60 Grythyttan, Sweden

Abstract

A new scientific research discipline has been accepted at the Department of Restaurant and Culinary Arts at Örebro University. The subject area definition of Culinary Arts and Meal Science, as opposed to Culinary Science, was chosen. This is because Culinary Arts places great emphasis on practical skills, aiming to combine these with science as well as with working methods with an artistic content. Thus its scientific approach is a multidisciplinary one, joint efforts with other sciences being necessary, for instance by maintaining a scientifically varied tutorship. Research areas such as ethnology, sociology, anthropology, business economics, nutrition, domestic science and public health all constitute adjacent branches. These areas treat the meal from various aspects, which are examined in this paper. During the course of our educational endeavours at the department, we studied the meal from a five-aspect viewpoint with the following main elements: the room, the meeting, the product, the atmosphere and the management control system, which also constitute the framework within which we formulate our issues and questions. First, this five-aspect approach is a constructive and all-inclusive aid for those who plan and produce meals, especially in restaurants – all with the ultimate aim to achieve maximum satisfaction among the guests in different meal situations. If, then, the guest/diner evaluates the meal with something like these five aspects in mind is the subject of our research! At present, seven PhD students have been admitted to the postgraduate course in Culinary Arts and Meal Science. These students will study the meal, or certain parts of it, and the importance of the various components are presented from a number of perspectives.

Introduction

Culinary Arts and Meal Science (CAMS) was accepted as a research discipline at the Grythyttan campus of Örebro University in 2001. The initiator of the project, to start the Bachelor programme in Grythyttan, was Carl Jan Granqvist, the owner of Grythyttan Inn. This article details the underpinning philosophy and how this influences the teaching and emergent research activities of CAMS. There is an interesting history behind our subject, which is briefly described below.

* A shortened version of this paper was originally presented at the Fourth International Conference on Culinary Arts and Sciences (ICCAS 03) held at Örebro University, Sweden, 23–27 June 2003.

Background

In 1992, the Swedish Parliament decided that Örebro College – now Örebro University – should provide an academic education for chefs and waiters that emphasized ‘the aesthetic configuration of the meal’ in commercial settings. Hence, under the leadership of the Head, Birgitta Ulmander, the Department of Restaurant and Culinary Arts was established with courses planned by teachers from different academic disciplines together with experienced professionals, chefs, waiters and restaurant owners.

The aim of this academic education was to increase the knowledge and the status of the professionals working in restaurants thereby enhancing restaurant business performance and laying a foundation for research. The education approach was distinguished by its com-
bination of academic disciplines, to stimulate scientific thinking and reflection, with the training of skills in handicraft and the ability and creativity to prepare aesthetic meals.

A model for this education was based on experience from the assessment of restaurants performed by Guide Michelin, the present Guide Rouge. The visit to a restaurant starts with entering a room, meeting a head waiter, getting a table and thereafter getting some food and beverages (here called the product). There is a surrounding atmosphere, which stands for the perception of the total situation, and a control management system, which stands for the overall planning, including controls of economy, logistics in the kitchen and in the dining room, management of personnel resources and laws regarding the handling of food and beverages. This model simplifies the concept of entity and the planning of creative and aesthetic meals confirmed by teachers and students, who have 10 years experience of the education at the Department of Restaurant and Culinary Arts. The model is also called an all-inclusive perspective of the meal.

Table 1 shows the main features of the Five Aspects Meal Model (FAMM).

### Table 1 The Five Aspects Meal Model (FAMM) from the Department of Restaurant and Culinary Arts (1990)

<table>
<thead>
<tr>
<th>Room</th>
<th>Meeting</th>
<th>Product</th>
<th>Atmosphere</th>
<th>Management control system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Style history</td>
<td>Social psychology</td>
<td>Theory and practical training about food and beverages, wine, beer, coffee, tea</td>
<td>History of ideas and cultural history</td>
<td>Business economy</td>
</tr>
<tr>
<td>Architectural style</td>
<td>Emotional theory</td>
<td>Meal forms training: canteen, à la carte, ceremonial meals</td>
<td>Communication: writing speaking</td>
<td>Computer work</td>
</tr>
<tr>
<td>Textiles</td>
<td>Social intercourse in different cultural groups</td>
<td>Food and cooking, creative cooking and creation of meal events</td>
<td></td>
<td>Handling statistics</td>
</tr>
<tr>
<td>Art science</td>
<td>Practical training: interpretation of guests and satisfying their wishes</td>
<td>Microbiology, nutrition cooking chemistry</td>
<td></td>
<td>Work environment</td>
</tr>
<tr>
<td>Design</td>
<td>Professional meetings; backstage and front stage</td>
<td>Menu planning</td>
<td>Choreography, body language</td>
<td>Marketing</td>
</tr>
<tr>
<td></td>
<td>Meetings: guests–guests</td>
<td>Sensory analysis</td>
<td>Colour, sounds and light</td>
<td>Organisation of the work</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Labour law</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The hotel and restaurant trade and their history</td>
<td>Floral decoration</td>
<td>Laws about working with alcohol</td>
</tr>
</tbody>
</table>

### Philosophical underpinnings

Our subject matter is defined as CAMS instead of just Culinary Science because of the importance attributed to practical knowledge in both our educational programme and within the research. Occidental scientific theory is largely founded on the assumption that science as such is based on theory. During classical antiquity, Plato’s definition of scientific knowledge was true and justified (Brumbaugh 1991). Occidental scientific theory thus ignores the fact that other types of knowledge also exist, deserving attention from a scientific perspective. For a long time theoretical knowledge has been associated with intellectual ability, as opposed to practical ability associated with the skills and knowledge of the human hand. Here, theoretical knowledge has been regarded as subordinate to practical/productive skill. However, Aristotle divided and defined different types of knowledge as important in human life.

He referred to theoretical and intellectual knowledge as *episteme*, practical skill, handicraft and art as *techne* and the political/ethical knowledge as *fronesis*. Knowledge that emanates from action is referred to as pragmatism. The philosopher John Dewey represents this philosophy. He coined the expression ‘learning by doing’ (Dewey 1916, 1966).

Discussions about the importance of combining of practical and theoretical knowledge began in the 19th century, but the practical implications have not been subject to philosophical discourse until recently (Ryle 1949, 1990; Gustavsson 2001). Other concepts that characterize practical skills are ‘knowledge of action’, or ‘knowledge of common practice’, discussed by
Molander (1996) or ‘tacit knowledge’ which is focused on by Polanyi (1983). The combination of practical and theoretical knowledge is obvious in many situations as there is a difference between knowing about and knowing how. For example, knowing about cycling is not the same thing as knowing how (being able to cycle). The latter requires practical training.

Focus on Culinary Arts and Meal Science

In view of the above, the concepts of ‘skill’ and ‘knowledge’ have been emphasized to underline this unity of science, craftsmanship and artistic quality (Gustafsson 2001; Gustafsson 2002). This acknowledgement of culinary arts and crafts, along with the aesthetic dimensions, is central to CAMS in teaching and research (Gustafsson 2002). Equally, the science base of CAMS is multidisciplinary and includes ethnology, sociology, anthropology, business economics, nutrition science, public health and domestic science. Each contributes in some way to an understanding of the meal.

The reason why our educational programme is organized around a particular view (FAMM) of the meal is the recognition that meals consists of much more than the food to be eaten. By contrast with Old Norse which specifies the meal as the time for eating, the Finnish sociologist Mäkelä (2000), defines a meal as the eating sphere. Figure 1 reflects this in a commercial context.

The ultimate aim of all five aspects is the same: to achieve maximum satisfaction in various meal situations for every guest/consumer/diner – preferably even greater than expected (Kelly & Le Bel 1995). There are of course different expectations depending on the type of eating situation (e.g. meals in canteens, different types of restaurants, ceremonial meals and private meals at home). There are different ways of grouping different meals. For example, Edwards (2000) groups them in ‘eating out for pleasure’, which encompasses our restaurants and ceremonial meals, ‘eating out for work’, which can take place in canteens or in restaurants, and ‘eating out for necessity’, which takes place in public institutions such as prisons, hospitals and schools where the choice is very limited. Warde & Martens’ (2000) typology of meals is in some way in line with Edwards’ but seems to indicate that eating public meals cannot be combined with pleasure, which must be the aim even of public meals. Therefore, it will be of great importance to try to give every guest/diner/consumer an optimal meal experience in every specific situation. Despite our focus being on commercial meals, our approach might also be applied to public and private meals both in the planning situation and probably also in the guest/diner/consumer experience situation.

The entirety of the meal

The room

The room constitutes the setting of the meal. This encompasses the shape of the room, how the room is connected to other rooms and how the people, both diners and staff, use the room. All these factors are somehow related to how the room is used within a time frame (e.g. the entrance, all the equipment in the room where the meal is taken, the toilet and the exit from the restaurant). A laid-out table may even qualify as ‘the small room’ in itself. Here the artist may come in, creating a sense of entirety. Does the restaurant or the meal situation tell a story to remember? Nissen Johansen & Blom (2003) have given a good example of the importance of a good story or creating an entirety when planning a restaurant or a room in the restaurant. What does that sense of entirety mean to different people? Is it important to them as a mark of aesthetics and perhaps important from an economic angle too? Is it possible to make both commercial and public meals more significant, and also more appealing, through the artist giving ‘expression’ to them? This is an issue now subject to research by our academy in the course of the meal project.

The meeting

The meeting refers to the interpersonal relations especially between the guests/diners themselves or the meeting between the staff and the guest/diner and their interactions – how the staff manage to discern the requirements of the guest, who is always an individual with his or her special identity. We therefore have to ask ourselves who he/she is, regardless of the kind of setting of this meal. To be successful within food service, the waiter must be able to make a rapid evaluation of the guest’s special identity and fulfill the personal requirements of that particular guest, making him or her satisfied and at ease (Martin 1991; Kelly & Le Bel 1995). One’s own selection of food or...
menu depends on who one is and on what type of occasion this meal is to be enjoyed. Here proper guidance is equally important and it is essential to bear this in mind if a commercial restaurant undertaking is to succeed. The importance of the meeting in entirely different meal settings, such as in fast food restaurants, hospitals or schools, as well as at home, is probably vastly underestimated and also unexplored. There are also meetings between different professionals working in the kitchen and the dining room, which have to be positive for the guests to perceive a friendly atmosphere.

The product
The product consists of the food and drink served and the combination of food and drink. By dint of their craftsmanship, the chefs transform the foodstuffs into appetizing dishes. Their theoretical knowledge of the art of cooking as well as foodstuff chemistry then helps to make their effort more target-oriented, as presented in Harold McGee's book *On Food and Cooking*, where he tries to combine the science and the craft (McGee 1997). Theoretical knowledge acquired from science supports this process, for instance when a soufflé is to be made; if the chefs know something about the physics and chemistry of its various stages, and are able to reflect over this, this is a great help towards a better end product. The waiters use their theoretical and practical knowledge of food and drink to supply advice and suggestions as to a suitable wine for a dish. The obvious purpose of this is to satisfy what expectations the guest may have in terms of a good combination of food and drink as well as good service. This process is guided by what the ‘craftsman/waiter’ has interpreted as the ‘guest identity’ regarding that person’s own tastes. If one link of the production and serving chain is broken, the diner’s level of enjoyment can be lowered. In other words, the whole product process requires both craftsmanship, practical/aesthetic knowledge and science in order to produce good meals and result in the optimum experience on the part of the guest/diner, which is also discussed by Pierson (2000).

The atmosphere
The atmosphere is very much created by the guests/diners themselves, however, to what extent this process may be supported by creative ideas from the staff is not clear. It would appear probable that skills and a creative setting can help a great deal; this is in fact another component of our present research project. The previously described meal elements may also contribute considerably to the total atmosphere. The atmosphere is here defined as feeling comfortable and at ease. Especially important is the verbal communication at the table between the diners as well as staff within the meeting aspect. Murcott (1998) and Menell et al. (1992) have focused on the sociological part of food and eating as a way to identify the specific culture of a country. An important ingredient in this culture transfer is the verbal communication.

The management control system
The management control system comprises several different systems of an administrative nature, such as economic and legal aspects. There are other rules for the treatment of food and the handling of wine and spirits, rules for personnel, for administration, and economic rules for running a company.

Another aspect is about how food logistics work at home, in canteens or in restaurants. At home people are usually located close to or eat in the kitchen, the home ‘chef’ knows how many to prepare food for and usually knows all the diners personally. In a canteen people walk up to the counter to get the food they choose from the daily menu, and many meals have to be served in a short time period sometimes several times a day. Hence, logistics must be planned for the peak periods during the day. A restaurant meal needs a more sophisticated logistics system; here, information about what guests want should be delivered from the waiter to the chef. That puts the chef(s) under pressure to deliver, for instance, several different dishes to the same table at the same time, so everybody around the table can enjoy their food at the same time. In ceremonial meals the dishes and the whole meal are prepared on a minute-to-minute basis to give the best meal experience.

Summing up the management control systems, it is important that the producers of food have good control systems so that all the products are produced in accordance with the laws formulated by the authorities. There are several aspects of management control systems and logistics, and they have to work together so that all people can feel confident about the health aspects of what they eat and drink at reasonable prices.

Finally, all five aspects described above interact and are important in the production situation of meals, but each might be perceived as more and less important by the guest/customer/diner. This is discussed by Pierson et al. (1995), who found that perception of meal quality was related to food, environment, the guests and to personnel but not the factors in the management control system. However, the management control system...
is working backstage, which might be the reason it is not mentioned by the guests.

**Food choice and scientific disciplines**

According to Shepherd (2001), individual factors behind a food choice are multidimensional (see Fig. 2). If we are to be successful in producing a commercial meal, we also have to understand our guests’ food choices, their way of eating and try to understand their preferences or attitudes. It is important to identify what guest category fits a certain restaurant concept.

There are many reasons why people choose what, how and when they eat in restaurants, in other public places and in their homes. Purely nutritional aspects of this are indeed motivational factors; however, culture, religion, price, brand, experience and personality are also important parts of this process, just as factual knowledge of food is (Shepherd & Dennison 1996; Meiselman 2000; Shepherd 2001). Tastes and personal preferences affect the decisions a great deal too (Rozin 2000), whereas wholesomeness and ‘safe foodstuffs’ mean much less. The physiological requisites of consuming food that do not upset your body are to be included here as well (Shepherd 1986; Abrahamsson et al. 1999).

There are teaching and research implications to be drawn from this situation. The study of the meal is multidisciplinary and the following is a brief account of related disciplines involved.

**Domestic science**

Domestic science attained research graduate school level as recently as 1991–92 in Sweden at the social science faculties. This subject puts its major emphasis on applied research, studying foodstuffs, in their various stages, together with eating habits and diets, from a multidisciplinary angle with the aid of knowledge acquired via nutrition, economics, sociology, ethnology, sensory science, etc. (Abrahamsson et al. 1999). International designations for this subject are domestic science, human ecology or home economics, or family and consumer sciences. It may well be said that ‘earlier on, domestic science was our research arena, too’, as CAMS emerged from a domestic science background but now focuses on the commercial meal, whereas domestic science focuses on the public and private meal. However, there remain many points of common interest.

**Nutrition and public health**

Nutrition and public health as a scientific discipline grew hand in hand with biomedical development in the 20th century. Ties may also be traced between nutrition and the processes of industrial and social welfare growth. Lack of food and ill-health among the working class, and the high infant mortality rate as well as epidemic diseases accelerated this development. Yet ‘nutrition’ in Sweden was not academically recognized as a natural science subject in its own right until 1968. If we include the nutrition and public health research in the area of meal research, nutrition is the dominating field. Previously, the subject focus was on the physiological effects of various nutritional substances, and how variations in their intake affected factors of interest in the process of retarding or accelerating welfare diseases. This was defined by Meltzer as ‘nutritional questions are food questions which have health aspects’ (Meltzer et al. 1992). The ties between the ‘food & health’ sphere, medical research and nutrition are obviously strong ones and are important when it comes to

---

**Figure 2** Factors affecting food choice and intake (Shepherd 2001).
the prevention of the increasing body weight and the incidence of diabetes mellitus in our society. Here, the restaurants and CAMS researchers should cooperate with physicians and dieticians to create healthier restaurant menus.

Ethnology

Ethnology is a study of people from an all-inclusive perspective. Food is an excellent study object to elaborate on – at the dining table both material and social and spiritual components join with cultural human (Bringeus 1988), and food is a useful tool for analysis (Salomonsson 1987). Food and meals have been studied, dealing with preparation, cooking and eating, both from historical and current viewpoints. As an example, studies have been made of traditional methods of growing, cooking and eating food among various social classes, from workers to more affluent groups. Various cultural manifestations are thus used in the process; research on food is definitely one of these. This is an obvious case of connection with CAMS, with people in their commercial meal-consuming role being subject to research.

Anthropology

Anthropological research efforts on food have produced two prominent figures, Mary Douglas (Douglas 1975) and Claude Lévi-Strauss (Lévi-Strauss 1983). The latter coined the expression ‘Food was good to think with,’ meaning that anthropologists should interpret the hidden codes existing in connection with food habits; this would then yield knowledge of the subconscious attitudes in society – ingredients, cooking techniques and habits, becoming bricks in a system of different values, even a mode of communication. Douglas thinks that food and eating are symbolical parts of a social system; she has studied, for instance, a British meal in detail, focusing on its structure and composition. Some typical subject areas of anthropological research are the special functions and symbolic meanings which traditional dishes have in certain rituals, just as they have in popular medicine and religion.

As of today, anthropologists are searching for ‘the Meaning of Food’, as a metaphor or as a symbol. Food intake is strongly related to social contexts, power, inclusion/exclusion, culturally dictated ideas about what is edible and what is not, the human body and the meaning of ‘health’ (Caplan 1997). These connections with CAMS are most obvious, for instance via studies of different eating and meal cultures, but also in view of the significance of various types of commercial meals to different people.

Sociology

The sociology of eating has been studied by a number of people, who have developed sociological perspectives on food consumption. These began with the earlier mentioned anthropologists Mary Douglas and Lévi-Strauss, and include Anne Murcott and her work on the British diet (Douglas 1975; Lévi-Strauss 1983; Murcott 1998). Other researchers include Bourdieu (1992), who discusses the social class differences in food habits and food preferences, and Jeffery Sobal, who discusses several dimensions of sociability which occur during the meal situation (Sobal 2000).

Alan Warde outlines some general theories concerning changes in consumer behaviour and food habits, and current trends in these habits (Warde 1997). He also asks for more research about taste, status, social class, gender, identities, the division of power in the household, traditions, migration, urbanization and civilization processes, new technologies and commercial exploitation.

Germov & Williams (1999) wrote A Sociology of Food and Nutrition. The Social Appetite. ‘The social appetite’ is how they labelled the three dominating trends of today – McDonaldization, social differentiation and self-rationalization. The authors assert that the McDonaldization trend leads to faster and faster homogenization and standardization of food production. Social differentiation involves the fact that people today are putting more effort into creating their own identity by way of their cooking, and also that they are, increasingly, selecting special types of food to achieve a kind of self-fulfilment, such as vegetarianism among young people. The self-rationalization trend implies that we are all trying to find our own identity in the chaos emerging from the present roar of messages about food. Here, feelings of happiness and well-being at the table are mixed with feelings of guilt and fear; in this maze of sensations one then attempts to find markers of social identity and life style. Thus, the ties with CAMS are many.

Business economics

The efficiency of a business must be measurable, especially in terms of its finances, but marketing models that focus on ‘meetings’ and ‘experiences’ should also be tested, jointly with economics scholars. For instance: What could the meal mean to a company’s own profile? Could, in fact, important contacts be established thanks to the meal? What does the meal mean in terms
of facilitating communication in general? Pine & Gilmore (1999) conclude that the service economy is peaking and that the experience economy is entering the world arena and consequently the research field as well.

The arts in the culinary arts

Nowadays, we recognize the possibilities opened by technology even in the production of food. This process is putting more and more emphasis on natural science in lieu of humanities, arts and ethics. Should this trend continue, then, culture, arts and creativity will be regarded as of little use to humans? Environments without an artistic touch, built solely on rational decisions and technology, easily result in a dull life (Nobel 1996).

What, then, could arts and creativity contribute towards a subject such as CAMS? Two of the characteristics of arts are the chain of creativity-totality-synthesis-freedom and that of multitude (Watz 2002). A characteristic of science is its systematic approach, and the possibility of repeating a discovery – which, in turn, often makes it impossible to study totalities. Several researchers, artists and authors such as Goethe and Schiller (Nobel 1997), Beuys (Adriani et al. 1981), etc. and even the United Nations, in the report Our Creative Diversity (UNESCO 1996) have emphasized the importance of art both as an observer of art and for creating an entirety, and giving meaning to life.

This knowledge may also be applied to a meal. An artist or designer can create a setting with her/his artistic eye around a meal made on the basis of both scientific and handicraft knowledge. A course in creative cooking has been developed at the Department of Restaurants and Culinary Arts. The aim of this course is to train the students in creative thinking and their cooking skill in order to increase their ability to create meals, based on art, creative thinking and handicraft, which hopefully will give their guests an extraordinary aesthetic experience (Watz & Johansson 2003).

The students are trained in perception and in interpretation of visual signals, colours, shapes and symbols. In this creativeness the encounter is important; encountering the room, the pauses, the atmosphere, the table, the colour, and the form, the taste of the meal, the handicraft, the feeling and the authenticity. Such a creative process could be useful even in the development of industrially produced meals. We might, then, not get so many new products on the market, which are only made with a small modification of a product already on the market, as is common today.

The importance of the totality and a story about the meal to give the guest/diner/consumer a greater and a more meaningful experience need to be studied in the future. An example of a success of using the story and totality thinking is shown by Nissen Johansen & Blom (2003), where a restaurant concept was created by an artist around a story ‘A taste of little Italy’. This example showed that such creativity together with craft and science can also be a very good for business.

A total experience of a meal is created thanks to the union of art, craft and science. What degree of importance should be ascribed to this in developing especially the commercial meal?

Present research fields in Culinary Arts and Meal Science

Some of our PhD studies are reported in the proceedings of the International Conference of Culinary Arts and Science 2003 in Sweden (Edwards & Gustafsson 2003).

The PhD students’ backgrounds are as diverse as the teaching disciplines in CAMS – culinary arts and meal science, domestic science and public health, hotel management, agronomy, horticulture and ethnology. A short summary of the current projects is presented below.

Food and wine in combination

This research project (Nygren et al. 2002) is being conducted by a PhD student with a bachelor’s degree in CAMS. The research question was raised by the researcher’s background as a Bachelor in CAMS and as a waiter. The research question was ‘How to match wine and food?’ This is a common subject in culinary magazines and books, but authors rarely give any reasons to back up their proposals (Ensrud 1984; Simon 1996). To study this question, sensory science methodology had to be used.

In sensory science, it is imperative to keep apart methodologies used to collect data about what we experience with our senses (objective facts) on the one hand, from those involving emotional data (subjective facts) (Meilgaard et al. 1991) on the other. Behind every experience are both physical and chemical excitations from stimuli, reaching our different receptors, and the psychological interpretation of these. The latter are based on, for instance, experience, acquired knowledge and personal expectations one may have at that moment (Cardello 1996).

The studies started with studying the combination of sauce and wine (Nygren et al. 2001) and went on with cheese and wine. First, a profile evaluation of different wines before and after testing two types of fermented blue mould cheese was made, trying to
establish, by analytical/sensory methods, what changes the food experience undergoes as combinations of food and wine were changed. The sensory panel thus determined the properties of the wine both before and after they tasted a particular cheese, by objective data collection (Nygren et al. 2002). In the process, the panel did not evaluate the wines; it only determined the intensity of various sensory attributes. In other words, it is the combinatorial process itself which they evaluated; it is then up to the different categories of wine consumers to decide which combinations of wine and cheese they prefer. Here, consumer identity will decide the outcome, that is, whether each person is an experienced wine drinker or not in consumer preference studies.

The meal sensory experience and the health

Sensory preferences of fat in various dishes and correlation of sensory preference for different foods to health parameters are sparsely studied. Two studies in this field are described below.

Sensory evaluation of specific flavours in sauces with various amounts of added butter

Fats contribute to the sensory properties of foods (Louis-Sylvestre 1999). When cooking food in restaurants, the amount of fat used is often arbitrary. A common belief is that when an extra knob of butter is added a more desired flavour is developed. When fat is added to food, the energy content increases. There is a correlation between dietary fat and obesity, which in turn increases the risk for welfare diseases such as type II diabetes and coronary heart diseases (CHDs). The aim of this study was to investigate if it is possible to reduce the usage of fat without influencing the sensory experience of the food.

Two sauces were evaluated regarding differences in flavour intensities between samples differing in fat content. Using a trained panel, a ranking test was performed for a chicken velouté and a tomato sauce, varying from 0 to 50% w/w added butter, respectively.

The pairwise analysis showed no significant differences in sensory attributes to near samples compared (e.g. 10–20% added butter in the sauces) (Nordin et al. 2003). While no difference in flavour intensities was experienced between sauces when the amount of butter was decreased, an extra knob is not defensible, regarding the energy content of the sauces.

To strengthen opportunities to improve public health through chefs, their attitudes to, knowledge of and willingness to use fat, regarding sensory properties and nutritive value will be investigated in later studies. This was being undertaken by a PhD student with a background of a master’s degree in agriculture with focus on food science.

Sensory preference and risk factors for coronary heart disease

Attraction to the sensory properties of fats is often cited as a critical motivating factor in fat consumption. Are there differences in sensory preferences between CHD patients and healthy controls, and can the sensory preferences be coupled to risk factors for CHD?

This study will encompass sensory consumer tests in combination with clinical studies aiming to elucidate if preferences for fatty food differ between groups and if there is any connection with sensory preferences and obesity or other risk factors in these groups.

Consumer oriented meal design

In another project, jointly administered with the Swedish Institute for Food and Biotechnology and the Department of Technology at Örebro University, we are studying how ready-made dishes are liked, quantitatively as well as qualitatively, in different settings. The copartners will undertake research on developing autonomous sensor systems and production systems to develop consumer-driven ready meals.

Situational influence on the consumption of ready meals

One part of this project will study the situational influence on the choice of ready meals, the PhD student concerned has a master’s degree in horticulture and a bachelor's degree in business economics. Recent market surveys show that the sales of ready meals are still increasing, especially for chilled foods. Even though consumption is increasing, a study performed by the Swedish Frozen Food Institute shows that consumers do not expect positive experiences of ready meals. Meiselman and coworkers showed in 1987 (Meiselman et al. 1987) that situational variables are important factors controlling the consumption of food in natural eating situations. In recently published studies of food choice, the eating environment has been identified as one of the important factors (Edwards et al. 2003).

The aim of the recent study was to map Swedish consumers regarding their consumption of ready meals in different eating situations and their reasons for eating ready meals in different situations, and the importance of different attributes at the purchase were defined. A market survey was sent out to 400 persons in the area of Gothenburg, Sweden. The information gathered in this investigation will be used in further
research to show if it is profitable to promote some categories of ready meals in a specific situational context for a target group of consumers.

Culinary arts and tasting classes

Our various senses, sight, hearing, perception of touch, smell and taste, are a precondition for our experience of food and meals. A French method, with tasting classes for 12-year-old children, involving culinary art and tasting experiences have been introduced and is now spreading in Swedish schools. The method is based on practical skills with cookery and the use of senses in learning, as well as an overall view of our senses and their interplay in relation to food and meals. A visit to a restaurant is included. The French handbook was translated into Swedish and exercises were adapted to Swedish habits. A series of school personnel education courses for class teachers, home economic teachers and school canteen personnel have been realized based on the material. Four pilot schools have been evaluated to find out the effects of the tasting classes through the understanding of children, school personnel and headmasters involved. Qualitative methods with focus groups for children and school personnel and interviews with headmasters and analyses using grounded theory were performed. The overall attitude to the method was positive among all participants. School personnel pointed out the influence on children as regards development, independent thinking, references to taste, as well as awakening senses and consciousness, and the potential of the method as a possibility for weak pupils. A greater ability to taste different food in the school canteen and higher status for school canteen meals was also put forward.

Taste classes constituted a means of working together for school personnel and, in this study, it was a tool for children’s independence training when arguing for their own individual taste (Jonsson et al. 2001). The project is called SAPERE from the Latin word sapere meaning – to taste and understand. The PhD student in this project has an MSc in Public Health but is also a qualified domestic science teacher.

The professional language of wine tasters

For professionals in the wine business, it is important to understand and handle the technical language in order to have a functional tool to describe and evaluate the sensory attributes of wines. In order to evaluate the effectiveness of a professional language, it is important to establish which terms are used and if the use is consistent between professionals, for instance, to increase the knowledge and confidence among waiters and sommeliers in their practical work. The aim of the study was to evaluate the use of the dialogue method when investigating the concept of the validity and reliability of the language used by professional wine tasters. The technique, inspired by the dialogue seminar method, was applied in order to compare the evaluations of attributes for four wines in the tasting group. The dialogue was introduced after the tasting and completion of written reports. The objective was to initiate a conversation among the tasters to stimulate reflections regarding their use of certain concepts. Tasting reports were analysed to establish variances with regard to handling the terminology. The dialogue was recorded to investigate verbal expressions among the tasters. It was found that variances for the attributes investigated could be explained by the use of different meanings for the same attribute/concept. During the dialogue, the participants were successful in verbalizing, identifying differences and discussing scales and applied terminology. This indicates that the dialogue seminar method, with applied modifications, might be a useful tool when training professional wine tasters. Based on our findings, we suggest that the method can also be used in order to introduce new concepts which might be included in a common language (Herdenstam et al. 2003). The PhD student involved in this study has a bachelor’s degree in CAMS.

The meal project

The principal aim of this project is to increase our understanding of the commercial meal concept as such, and how this could help us to reach various goals and, further, to make an analysis of what today’s modern ‘experience economy’ (Pine & Gilmore 1999) might mean to CAMS in general and commercial meals in particular.

This is studied from an ethnological perspective of how local and regional eating cultures are created and practised; this is to include approaches from both commercial, noncommercial and political angles (Tellström et al. 2003). The research is centred around the processes prevailing when small-scale food production and local restaurant businesses make themselves competitive by means of processing and refining local food produce, thereby adding increased value and resulting in recognized examples of culinary art, which may even develop into renowned symbols of a whole geographical area! This study process will include local actors, how they cooperate and what their ‘food culture show arenas’ are, at present, as well as new developments. The ethnology part of study is being carried out by a PhD student with a degree of Master of Arts with a major in Ethnology.
Another study in the meal project is research from a service management perspective on the evaluation of à la carte restaurants. The objective of the research is to evaluate customers’ meal experiences in à la carte restaurants and to develop a methodological tool for evaluating their meal experiences. The study will try to identify key factors influencing the customers’ meal experiences and develop a suitable evaluation method for a meal experience from the customers’ point of view in commercial à la carte restaurants for quality improvement. The initial part of the study has been evaluated and there are interesting findings about the customers’ perceptions of paying the bill. Waiting for the bill irritated most of the customers and could be one of the reasons why they would not visit that restaurant again (Hansen et al. 2003). The PhD student in this second part of the meal project has an MSc degree in Hotel Management.

Concluding remarks

In the course of investigating the research subject of CAMS, described above, the large components as well as the small parts are to be studied both in a multidisciplinary manner and in harmony with craftsmanship and artistic ability. There are many questions raised from the practical field, for example, how to match wine and food combinations, how to use wine language as a working tool, what is the most important point for customers visiting restaurants, how to make restaurant meals more appealing, is it possible to get acceptance at restaurants for healthier menus, how do people’s sensory preferences for food affect their choice and health? Furthermore, many questions arise from the cooking methodology, affecting the taste, consistency and appearance via changes in the chemistry and physics of the food. Such research is ongoing in the food industries, but their results are mostly not applicable in the restaurant kitchen. As already mentioned, this requires joint efforts with other disciplines, which is why a brief overview of other subject areas also involved in the meal process was given above. It is important to understand the selective processes of humans when it comes to experiencing and producing meals and to understand the symbols of food for different people from different classes and cultures to meet people’s requirements in different meal situations. So studies on why and how people select their meals and to understand the symbols of food for different people from different classes and cultures to meet people’s requirements in different meal situations require a multidisciplinary approach. Another important factor to study is the aesthetic dimension of a meal, which probably answers an important need among many people.

Nutrition is tied to CAMS when it comes to creating well-balanced meals that are beneficial to human health. However, studies on the effects of food on humans have been extensive, nevertheless welfare diseases such as diabetes mellitus and obesity are increasing dramatically especially in lower socioeconomic groups. Being aware of the problem is probably not enough. We have to acquire the tools to help people to change their dietary habits. One way to do this might be to start with the children, to train their senses; with our SAPERE method they might change their preference for healthier food. Another way is to include the restaurant trade and the food industry in this work.

Another issue is that too little emphasis is put on the practical application of dietary advice. Physicians and dieticians need to have more practical knowledge when giving people advice. Professionals in restaurants need more theoretical background to their practical knowledge, both to improve business and also to serve well-balanced menus in a delicious way.

One issue, which has not yet been investigated, is that of whether connections exist between the socioeconomic status of people and their preferences of taste – an important matter, to be sure, if we want to successfully intervene in the eating habits of people.

To sum up, CAMS aims to unify craft, artistry and science in research and development of the meal in different situations, taking into account the whole meal sphere. If we only focus on science and delete the practical knowledge we will be at a loss when it comes to giving people an experience. Furthermore, the arts are of course important, which is also stated by Aristotle, who said that ‘Art is a way to increase the intensity of our own experiences, an element of the ethically well-founded endeavour to achieve a fuller life’. In short, our senses and crafts in a harmonious union with science might give us a better meal experience.

References

Polanyi M (1983). Tacit Dimension. Peter Smith Publisher Inc.: Gloucester, MA, USA.


