

Cuisine: the concept and its health and nutrition implications – global

Robert MacLennan FRACP¹ and Aizhen Zhang MD²

¹ *Queensland Institute of Medical Research, Brisbane, Australia;*

² *Medical Nutrition and Food Hygiene Institute, Zhejiang University, Hangzhou, China*

Cuisine, broadly food culture, has evolved greatly in the past ten thousand years, following the domestication of plants and animals which greatly increased the food supply and led to villages, cities and civilizations. Major factors in the evolution of cuisines have been the existing biota, soils, fuel for cooking and climates, followed by new technologies, exploration and trade. These provide the context of the world's amazing variety of cuisines, but not the understanding of why cuisines developed as they have, in particular why China has the world's greatest cuisine. There is evidence that the diet of older women in Zhejiang province meets the recent WHO guidelines for the prevention of chronic disease, consistent with reported longevity in the province. But current changes with the industrialization and globalization of cuisines are associated with increases in chronic diseases, and point to much greater increases in the future.

Key Words: evolution, food cultures, old age, China, chronic diseases

The concept of cuisine

Messer¹ describes a cultural cuisine as the culturally elaborated and transmitted body of food related practices of any given culture. It includes the selected basic foods, characteristic flavourings, processing (eg chopping and cooking), rules dealing with acceptable foods and combinations and textures; festival foods; the social context of eating; together with the symbolic combinations of foods in meals, menus, and seasonal or lifetime cycles of ritual foods and eating. The concept includes gastronomy, the art and science of good eating; and diet which includes the types and quantities of food and drink and their contribution to macro and micronutrient intakes.

Globally there is enormous variation in what people eat and how they prepare and eat it. How did different cuisines get to where they are today? Soil, climate, and past domestication of plants and animals and their subsequent geographical spread are major influences on staple foods. But cuisine may be independent of available foods. For example, if chefs from Colombia, France and China were to visit large markets in Hangzhou and be given free choice of available ingredients, there would be major differences in their subsequently prepared dishes. Even if they chose the same basic repertoire of ingredients, the modes of preparation, cooking, and serving would be distinctly different. The ability of Chinese cooks to adapt to local ingredients is seen in Chinese restaurants worldwide. Their dishes remain distinctly Chinese but often reflect local preferences. As with other aspects of culture such as language, cuisine varies by region within countries. Regional differences in cuisine also tend to lessen with development.

Evolution of cuisine and the factors which drive it

The hunter-gatherers of 15 thousand years ago have been replaced mainly by farmers, except in areas of very low rainfall which support usually migratory animal herders. The domestication of plants and animals enabled settlement in villages and eventual coalescence into larger groupings. Plants were spread by trade across Asia to similar climates. European exploration of the Americas introduced numerous new foods to Eurasia and Africa. The "Mediterranean Diet" evolved greatly after Columbus. For example, today the idea of southern Italian cuisine without tomatoes (brought from the Americas) now appears extraordinary. Cuisines have evolved with increasing complexity of social organisation within areas, but where such areas had barriers to communication with others, whether physical or due to warfare, cuisines evolved independently. Cuisine continues to evolve with urbanisation, agribusiness and globalisation.

Animal herders and hunter gatherers

Domestication of animals depended on what was available and suitable for an area. In Northern Kenya's semi-desert the Samburu have mainly cattle while the Rendille herd mainly camels. The traditional adaptation of the Rendille to their environment has since been disrupted by a mission providing a permanent water supply from wells. Overgrazing then caused severe environmental degradation and consequent dependence on non-traditional foods. As else-

Correspondence address: Emeritus Professor Robert MacLennan, Queensland Institute of Medical Research, Post Office Royal Brisbane Hospital, Qld 4029, Australia; Email: bobM@qimr.edu.au

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where the last is likely to lead to what Burkitt described as the “Diseases of Western Civilization”. Disruption of ecological systems and human adaptations with consequent physical and social ill-health was widespread in many colonised populations in the 19th and 20th centuries, and continues on all continents to this day, especially in former hunter gatherers and animal herders whose cuisine was greatly changed. For example, the former hunter-gatherer Australian aborigines have consequently high death rates from chronic diseases as a result of loss of their traditional cuisines.

Farming

Historically agriculture began in Southwest Asia (Europe’s “Near East”) with the domestication of wild animals and grasses some ten thousand years ago. Barley, peas, lentils, and chickpeas were domesticated around the same time. Other plants were independently domesticated in East Asia, and Central and South America, Eastern “United States”, and possibly parts of Africa and New Guinea. With farming, land can feed 10 to 100 times more than with hunter gathering, leading to larger populations with food surpluses. Large, complex societies elaborated cuisines, developed gastronomy and utilized new types and varieties of foods. New Guinea farmers never had foods which could be stored more than a few months, and until recently tribes in the high interior mountains had no metal tools. They were contemporary examples of how many human societies, especially those living in the tropics, lived for millennia. “The limits of food production in New Guinea had nothing to do with New Guinea peoples, and everything with the New Guinea biota and environment”.²

Southern European cuisine

The Mediterranean diet comprises bread, wine, olive oil, many fruits and vegetables, fish and small amounts of animal flesh. As elsewhere, it has incorporated new foods over time.³ “Three rival systems have influenced the culture of food in Southern Europe since late antiquity, and in various combinations have informed eating patterns at all levels of society”.⁴ The “*Christian*” system encompasses monastic asceticism and the calendar of fasts and feasts, with an ideal goal of spiritual purity through control of bodily urges – deriving from Greek and Eastern ideas about the dualism of body and soul. The “*Medical*” has influenced common beliefs for 2000 years, and is based on a system of humoral physiology to maintain or recover health by diet. The concepts spread from Hippocrates and Galen to Arabs to Spain in the 12th and 13th centuries, surviving in Europe until the 19th century. They may have also spread to China via India with Buddhism, or evolved independently. For health, four major body fluids or humours consisting of heat or cold plus moisture or dryness had to be present in correct proportions, which varied by individuals. Each food had its own dominant humour which interacts with the individual’s humoral balance. The complexion of each food determined how best it would combine with other foods eg “cold and moist” melon with “hot and dry” prosciutto ham. Humoral physiology is at the very heart of many culinary traditions that persist in Southern

Europe. Season had to be considered in each meal (because the body responds to atmospheric conditions and air quality), as did age, gender, exercise and sexual activity (which heated and dried the body). “Cold and moist” lettuce is combined with “hot and dry” herbs, both of whose humoral natures are counteracted by “hot and dry” salt and “cold and dry” vinegar. The third system was the “*Courtly*” or *Gastronomic* food culture in urban centres of power and the courts of Aragon, Castile and Provence.⁴ The “Mediterranean Diet” evolved greatly after Columbus. Today southern Italian cuisine without tomatoes (brought from the Americas) appears extraordinary.

Regional variation

Regional cuisines reflect past cultural isolation. Within France, the North has cooked with butter and lard and preferred beer or cider whereas the South has nut or olive oil and wine. Mortality from coronary heart disease is twice as high in the North.⁵ Regional cooking is now a proud part of cultural identity, frequently reserved for festive occasions. But some regional foods now eaten frequently are of relatively recent origin. For example, in Southern France tomatoes, beans, potatoes and artichokes are basic elements of the cuisine but only reached there after the 15th century.

Migration

Migrants from China and Japan to the USA and from Southern Europe to Australia have rapidly increased rates of colorectal cancer. Their cuisine changed mainly in the relative proportions of prestige foods. Thus in Western Australia, at a time when native-born Australians were decreasing their intake of meat and increasing vegetable consumption, Italian migrants were doing the reverse compared with their intakes before migration.⁶ Many Greek and Lebanese migrants in Australia cook recipes now little used in their home countries. Australians overseas like to eat the yeast extract Vegemite on bread and butter to remind them of home. English migrants to Canada use the original yeast extract Marmite. Thus particular foods forming only part of cuisines may be markers of cultural identity.

Urbanization, culture change and globalization

Protein-energy malnutrition in Africa has a complex causation – loss of traditional cultural regulation of spacing of pregnancies, rural-urban displacement with increasing population, artificial milk feeding for many years promoted by Nestle; infectious diseases such as measles, and use of culturally significant but low protein traditional foods. Coca-Cola, KFC, McDonald’s, Starbucks etc have products which are mainly consumed by the young, especially in cities. Watson⁷ found that parents in Hong Kong were happy for their children to spend time in McDonald’s where they were safe, and less exposed to the drug culture. There are now many similar national corporations within Asian countries serving standardised food. In Zhejiang Province, they seem to have replaced food stalls. The evolution of cuisine with globalization is likely to have adverse health effects worldwide.

Changes in cuisine in old age

Ageing has health problems in both developed and developing nations. In the latter, in addition to existing difficulties in managing communicable diseases, there is an increasing burden of chronic and degenerative diseases including cancer, cardiovascular disease, diabetes, dementia, arthritis, and osteoporosis which require continuing care.⁸ Health can be considered as successful coping with one's environment - socio-cultural, physical, microbial etc even in the presence of disease. Apart from supplying nutrients essential for health in old age, the social interactions in food culture play an important role in the successful adaptation of the aged. A total health assessment score was used in the IUNS Food Habits in Later Life Project where non-nutritional (well-being, memory, general health, medication-use, activities of daily living, exercise, social activity and social network scores) and nutritional variables (intake of food groups g/day, food groups variety scores, nutrients) were modelled in multivariate analyses of Greeks in Melbourne and Greece. Food culture was found to influence both quality of life and survival in Greek elderly.⁹ Social interaction is facilitated in extended family households in traditional societies, but is lacking in many Western populations where the elderly often live alone, especially after the death of a spouse. Similar problems are now common in urban areas in many industrializing countries. Newly built accommodation frequently does not cater to extended families, and will be an increasing problem in many countries including China. Social isolation is likely to result in a less varied food intake. Purchasing a variety of foods is often difficult, and diet-related micronutrient deficiencies are an outcome. Retirement communities are one solution, increasingly common in the West, and provide opportunities for social interaction. Eating with friends is important, and can be facilitated in such communities. Even if meals are not shared, social isolation can be reduced. Another solution is in China where around Hangzhou one sees buildings of 3 or 4 floors with a small "footprint" but accommodating 3 or more generations of a family. Many elderly are isolated and programmes such as the government sponsored "Meals on Wheels" in Australia, where a hot meal is delivered once a day at affordable cost, help maintain nutritional, but not social health.

Chinese cuisine

Anderson¹⁰ writes that throughout Chinese history, the boundary between medicine and food was so vague as to be non-existent in practice. Much of the elaboration and variety of Chinese cuisine is owed to medicine. The Chinese are united by an interest in and commitment to good cooking and good food. Almost everyone is concerned with the best and can tell an observer where to find it. Freshness and natural flavours are the keys to the most central ideas about food in Chinese society. Chinese food owes much of its sophistication and elaboration to a uniquely important place in the social scheme of things. Food is not just a source of nutrients but also a means of communication - of social status, special occasions, and other social facts. The kind of wealth and food productivity that Marco Polo saw in Hangzhou was not a

mere function of urbanization and trade; it presupposes a long history of conscious planning. Although agriculture was considered the most important work of the State and its citizens, gastronomy was a part of life, even for the peasants. There was no puritanical tradition which interfered with the enjoyment of food as well as other pleasures of the body.¹⁰

The capital was moved to Hangzhou, beginning the Southern Sung after 1117. The Sung was a period of great breadth and tolerance in eating patterns. Connoisseurship and gastronomy flourished in the thriving cities. Cookbooks were published and recipes included in encyclopaedias.¹⁰ After Ghengis Khan's grandson Khubla Khan (Qubilai Qan) conquered China, Marco Polo (from Venice) is believed to have been an administrator in Hangzhou which he described as "beyond dispute the finest and noblest city in the world" and "where so many pleasures may be found that one fancies himself to be in paradise". His description of the markets gives some indication of the gastronomic riches of Hangzhou during the period.¹¹

Cheng¹² defines good cooking as "the employment of the culinary art in producing what is appetizing to the eye, the nose, and the palate, and is agreeable to the stomach". Certain kinds of dishes, to be considered properly done, must fulfil certain conditions. Most important are fire and time - the proper degree of heat and the proper length of time should be used. The cardinal idea is that the thing cooked should be tender without losing its original flavour. The fire should be controlled to avoid hard boiling and loss of flavour. There is evidence that cooking styles evolved according to availability of fuel for cooking. Fuel is saved by the design of the stove, by cutting food into small pieces, and by fast high-heat cooking. Chinese cooking was primarily boiling and steaming under a tight cover, with stir-frying a minor but universal adjunct due to the relatively high cost of oil¹⁰.

It appears that the Chinese value food and good cooking primarily for its taste. The medicinal significance of foods seems to be a secondary consideration governing what is eaten and in which combinations. Classical dishes have a long history, often associated with stories of their origin, that serve to maintain appropriate recipes. But enormous changes are occurring in urban populations such that the health benefits of traditional cuisine are in danger of being diminished.

Population nutrient intake goals

The report of a joint WHO/FAO Expert Consultation in 2002¹³ specifies population nutrient intake goals for the prevention of diet-related chronic diseases. These goals are compared with recent published data¹⁴ from normal population controls in a case-control study of ovarian cancer. The controls were age matched, and hence represent middle-aged and elderly women. Diet was assessed by interview. Mean daily energy and nutrient intake of adult women from Zhejiang province of which Hangzhou is the capital are compared with the WHO/FAO recommended nutrient intake goals in the table. In the province as a whole, the goals are met for total fat, total carbohydrate, protein, cholesterol, sodium chloride (sodium), and fruits and vegetables. There is thus

Table 1. WHO 2003 Population Nutrient Intake Goals compared with normal adults in Zhejiang Province¹

Dietary Factor	Goal	Female Adults in Zhejiang*
Total fat (%E)	15-30	22.8 ± 6.8
CHO (%E)	55-75	64.6 ± 7.7
Protein (%E)	10-15	13.6 ± 3.3
Cholesterol (mg/day)	<300	239.2 ± 178.6
Sodium (g/day)	<5	2.78 ± 0.11
Fruits and vegetables (g/day)	≥400	691 ± 357

¹from Zhang M et al¹⁴ %E = % of energy, CHO = carbohydrate

evidence that, on average, the diet of older women in Zhejiang, including meals at home and outside the home, meets the WHO goals. This is consistent with widely held beliefs in longevity in women in the province, supported by vital statistics that urban women in the province have among the highest life expectancies in China.¹⁵ But given the proliferation of Western type fast food outlets in the cities, it appears likely that the dietary goals are not being met by many younger people and an increase in adverse outcomes such as obesity and diabetes has already been seen and is likely to become greater in the future.

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烹调及营养和健康的全球性意义

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Robert MacLennan and Aizhen Zhang

野生动植物的驯养与种植极大地增加了食物供给，并导致了村庄、城市和文明社会的形成，因此，烹饪—广义上即为饮食文化，在过去的一万年间发展迅速。影响烹饪发展的主要因素包括既有的生物圈、土壤和气候，还包括随后产生的新技术、探险开发和贸易。它们促进了世界多样化烹饪的形成，但是，还是不能解释烹饪为什么会如此发展，特别是为什么中国会有世界上最伟大的烹饪。资料表明浙江省老年妇女的饮食达到了 WHO 最近的关于预防慢性疾病的指南标准，这与据报道该省居民寿命长是一致的。但是，随着工业化和烹饪全球化的发展带来的巨大变化，慢性病的发生率也在上涨，在将来还会有大幅度增长趋势。

Cuisine, broadly food culture, has evolved greatly in the past ten thousand years, following the domestication of plants and animals which greatly increased the food supply and led to villages, cities and civilizations. Major factors in the evolution of cuisines have been the existing biota, soils, fuel for cooking and climates, followed by new technologies, exploration and trade. These provide the context of the world's amazing variety of cuisines, but not the understanding of why cuisines developed as they have, in particular why China has the world's greatest cuisine. There is evidence that the diet of older women in Zhejiang province meets the recent WHO guidelines for the prevention of chronic disease, consistent with reported longevity in the province. But current changes with the industrialization and globalization of cuisines are associated with increases in chronic diseases, and point to much greater increases in the future.

Key words: cuisine, food, economic development, health, eco-nutrition, Hangzhou, Zhejiang Province, China, science, technology, trade, transport, migration, social cohesion