

Diet and dietetics in al-Andalus

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Al-Andalus society (711–1492) based its idea of health on the wisdom of Classical Greece, the Hippocratic–Galenic theories, as well as the Persian and Hindu cultures. The twelfth century in al-Andalus is considered to be the most prolific period for works of a scientific and technical nature. At the time, the main treatises on dietetics were written and this science reached its widest expression with such leading figures as Ibn Wāfīd, Avenzoar, Averroes and Maimonides, whose works revealed the first scientific knowledge on the nutritional processes of the human body. Diet was regarded as being essential for health and the prevention of disease. Dietary guidelines were written for different age groups, different body types and different seasons of the year. The amount of food to be ingested, the number of meals recommended and the order in which the food should be consumed were all issues that were discussed. A variety of foods were thought to have medicinal properties, some of which are known today. The diet in al-Andalus was varied and very probably made a substantial contribution to the origin of the present-day Mediterranean diet, rich in olive oil, wholemeal cereals, fruit and vegetables, fish, lamb, poultry, nuts and spices. We also find that many of the terms in current use in diet and agriculture are a living testimony to the Arabic influence, as are many of the dishes of our varied Mediterranean gastronomy.

Al-Andalus: Nutrition history: Mediterranean diet

Al-Andalus was the name given to the large area of Iberian Peninsula occupied by the Muslims from the eighth century to the end of the fifteenth century. It was a civilization with a well-defined personality, mainly the result of the fusion between the Islamic civilization from Arabia and the Roman-Gothic culture of Hispania.

The Muslim domination of what was to be al-Andalus began in 711 when Tariq ibn Ziyad disembarked with his troops in Gibraltar and within a period of only 5 years much of the Iberian Peninsula had been occupied. For more than 700 years there were various agreements and confrontations with the Gothic and subsequently Christian kings, and there were continual changes in the amount of territory occupied. The period of Muslim dominance came to an end in 1492 when the Catholic kings entered Granada and defeated Boabdil, the last Nazarí king.

A political structure was set up for government, land administration and tax collecting, and it existed alongside the systems of the Christian and Jewish communities, who enjoyed a considerable amount of political and religious autonomy. A multi-ethnic society grew up consisting of Mozarabs, Christians living under Moorish rule; Jews, who played a leading role in society; Arabs and their descendants, who were the minority ruling class; Berbers, who came from the north of Africa and were the majority of the Muslim population; Mudéjares, the Muslims living under Christian rule; and, finally, Muladíes or converts to Islam.

Al-Andalus was an advanced cultured society which was responsible for revolutionizing a wide range of disciplines from agriculture to medicine, a science which acquired great prestige in and beyond al-Andalus. Education and knowledge were encouraged by emirs and caliphs, and art, architecture, prose, poetry and music were highly valued disciplines. As far

as science was concerned, there were such leading wise men, mathematicians, astronomers and physicians as Avempace, Averroes and the Jew Maimonides. The Andalusí culture (i.e. the specific culture of al-Andalus) transmitted the knowledge of the ancient world to medieval Europe and was one of the factors that led to the emergence of the Renaissance.

The basis of dietetics and the Andalusí diet and its sources

The inhabitants of al-Andalus based their idea of health on the wisdom of Classical Greece, on the Hippocratic–Galenic theories and on the Persian and Hindu cultures, although the latter had a more limited influence. The term ‘diet’ was taken from Classical Greece (δίαίτα) but the concept was much broader than its current use. Diet was a synonym for a system of life. It included the practice of eating correctly, of choosing the best places for staying healthy and lengthening one’s life, of bathing and washing correctly, of sleeping and staying awake, of expelling useless substances from one’s body and of dealing with the ups and downs of the spirit (Cruz, 1997).

Several authors of the Roman Empire also had considerable influence on Andalusí medical and scientific thought. The work *De materia Medica* by Dioscorides Pedanius, which made a study of vegetable foods, and the work by Galeno de Pergamo (130–200 AD), the author of more than 500 medical treatises that provide numerous dietary guidelines, were translated and taken as the basis of Andalusí dietetics.

The science from the Islamic East also had considerable influence, particularly through the work of Rhazes and Avicenna. Abū Bakr b. M. b. Zakarīyā al-Rāzī (Rhazes) was one of the authors of the *Kitāb dār al-madarr al-agdiya* (*A Compendium of Harmful Foods*). Rhazes belonged to the Persian school and can be

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regarded as the father of experimental medicine. He divided medicine into public health, preventive medicine and the treatment of diseases. He has been credited with the phrase: 'If the patient can be treated through diet, simple medicines, and combinations of medicines in particular, should be avoided.' Abū 'Alī al-Husayn ibn Sina (Avicenna), doctor, philosopher, mathematician and astronomer, was born in Persia (980–1037) and wrote numerous books and treatises. His most famous work is the *Kitāb al-qānūn*, or *Canon of Medicine*, which was to become the reference text for practising and teaching medicine in Europe until the end of the Renaissance (Avicenna, 1490). In his work, we find recommendations such as this one about one of the most characteristic habits of Mediterranean countries, the siesta: 'The best sleep comes after what has been eaten has descended from the upper part of the stomach; and if this process takes some time, it would be advisable to go for a short walk.'

Parallel to the splendour of the scientific development in the East, in the Iberian Peninsula between the tenth and eleventh centuries science consolidates and acquires characteristics all of its own, giving rise to the emergence of scientists of the importance of Ibn Wāfīd, who wrote several treatises and works of medicine, the best known of which were *The Book of Simple Medicines (Kitāb al-adwiya al-mufrada)* (Ibn Wāfīd, 1995) and *The Pillow Book (Kitāb al-wisad)*. His scientific work is reflected in the work of subsequent authors such as Avenzoar or Averroes. Ibn Wāfīd systematically describes the use of various foods, plants, minerals or animals for the prevention and treatment of disease. *The Pillow Book* (Ibn Wāfīd, 1980) is fundamentally a recipe book of pharmacological value that contains recipes based on certain foods. It is of doubtful scientific value.

The twelfth century was the period in which most scientific and technical works were produced. The main treatises in dietetics were written at this time and the discipline reached its maximum expression at the hand of three main figures: Avenzoar, Averroes and Maimonides.

Abū Marwān 'Abd al-Malik b. Abī 'Alā' b. Zuhr, known as Avenzoar, was born in Seville (1091–1162). For Avenzoar, experience is the guide and the basis of medical practice. He wrote numerous texts of which we shall mention two: the *Kitāb al-Taysīr (Book for the Study of Therapeutics and Diet)* and the *Kitāb al-Agdiya* (Ibn Zuhr, Abd al-Malik ibn Abi al-Ala, 1992). The former, regarded as his most important work, is a manual of prophylaxis and therapeutics, which describes artificial feeding through the oesophagus for the first time. In the *Kitāb al-Agdiya*, or treatise on food, he describes the preventive or medicinal properties of foods as well as their gastronomic value. He also sets down rules and recommendations for preventing and treating disease, and provides guidelines about sleep, physical exercise and the use of purgatives.

The second of the physicians was Abū al-Walīd M. b. Ahmad b. M. b. Rušd (Averroes). Born in Córdoba (1126–1198), he wrote several medical works, the best known of which was the *Kitāb al-kulliyāt fī l-tibb (Book of Medical Generalities)*, known in Latin as the *Colliget* (Abu al-Walid ibn Rushd, 2003). This book dealt with the training of doctors, and discussed the topics of physiology, anatomy, pathology, therapeutics, hygiene and medication. It also gave recommendations about the quantity and frequency of

meals, the order in which different foods should be ingested and the changes in diet with age and build.

The third of the great Andalusī masters is Moses b. 'Abd Allāh b. Maimūn al-Qurtubī al-Isra'īlī, known as Maimonides (1135–1204). Of particular importance among his numerous medical works is *al-risālat fī tadbīr al-sihha* or *Treatise on the Health Regimen* (Peña *et al.* 1999), as well as other treatises and epistles.

The eating habits of the age can also be studied through such other sources of information as agricultural treatises, cooking manuals, treatises on the Hisba, agricultural calendars and historical tales (Huici Miranda, 1967; Debbabi Missaoui, 1995; Abu Ber Abdalacis Al-Arbūlī, 2000; García Sánchez, 2002).

Nutrition and the assimilation of food

The Andalusī physicians had considerable knowledge of the processes by which food was assimilated, from the moment it entered the body, to its digestion, absorption, diffusion to the organs and excretion. For them, nutrition is the process by which food and drink are transformed in the humours of the body.

Averroes, for instance, divides nutrition into ingestion, digestion and excretion. By ingestion he means trituration, mastication and insalivation. He uses digestion to refer to three processes: the first takes place in the stomach and fabricates the chyme; the second takes place in the liver when the chyme enters through the portal vein, turning into blood; and the third is the process of assimilating the food which leads to tissue formation. The digestions give rise to yellow bile, black bile and fat, which he says can be a sign of health in small doses but which can lead to the degeneration and death of the organs if there is in excess. The first digestion gives rise to dry residues (faeces) and the second to urine, which will subsequently be expelled. Even in that early period, Averroes explained that after it had reached the stomach and been absorbed, food could produce a signal of satiation.

Food and the prevention of disease

All the Andalusī authors base their theory of health or hygiene on the balance between the four humours described by Hippocrates and Galen (Fig. 1). They relate food to the four elements of nature (water, fire, earth and air), each of which has a corresponding temperament (wet, hot, dry or cold), a corresponding humour (blood, phlegm, yellow bile and black bile) and a corresponding taste (sweet, salty, bitter and sour). So, for example, a blood imbalance (hot, wet and sweet) would require a cold, dry and sour diet; a phlegm imbalance (cold, wet and salty) would require a hot, dry and bitter diet; a yellow bile imbalance (hot, dry and bitter) would require a wet, cold and salty diet; and a black bile imbalance (cold, dry and sour) would require a wet, hot and sweet diet.

So when Avenzoar speaks of peaches or butter, he says that they are cold and wet, lamb's meat and pine nuts are hot and dry, hare and figs are hot and wet, and bread made from millet or sorghum and cat's meat are cold and dry.

The amount of food and the frequency of food intake

Medicine relates the preservation of health to the quantity and quality of food. The idea that eating too much is harmful

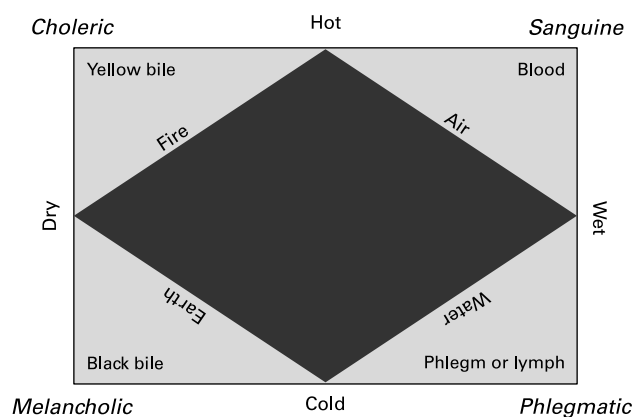


Fig. 1. Representation of the theory of humours.

and can cause disease is a constant in medical treatises, to such an extent that diet and fasting have been recommended as one means of treating disease. Averroes says that: 'the use of food in accordance with the rules of Medicine, prevents disease.' And Maimonides says: 'The conservation of health is based on two rules: do not eat too much and do not stop doing physical exercise' and also 'eating in excess is a deadly poison for all sorts of body constitutions and it is the main cause of all diseases.'

Maimonides advises against eating before you feel really hungry and he says that you can tell when you reach this state because the mouth begins to secrete saliva. If the amount of food is appropriate, digestion will be perfect, the organs will function and the state of health will be good. If it is not, the excess food will turn into noxious substances harmful to the body. The amount also depends on the time of year: food intake should be decreased in warmer weather because digestion is slower.

The number of meals per day will depend on the nature of the individual and his/her state of health. The most common advice is to eat two meals a day, one in the morning and the other at night. It is recommended that the second of the two should be the most copious. Ibn al-Jatīb, however, stated that it is dietetically more balanced to eat three meals every 2 days, depending on the nutrient consumed, because he believed that digestion varied from person to person and could last between 6 and 12h. Curiously, we find that he also extends this guideline to physical activity and bathing: he recommends that exercise should be done after meals as a way of staying healthy.

The order of meals

Another of the hygienic guidelines aiming to make individuals healthier is that which determines the order in which food should be eaten if digestion is to be good. Avenzoar states that the heavier foods should be eaten at the beginning of the meal so that they are deposited on the bottom of the stomach where, so he believed, the digestion was most powerful. For Averroes, the most important thing about the order of eating is to consume the food in such a way that it benefits the formation and evacuation of the faeces. To this end, he advises that dishes consisting of green vegetables and salads should be eaten first. It is interesting to observe that the order advised by

Andalusi medicine is very similar to current practice in the Mediterranean countries.

Diet and the different stages of life

Medical treatises and manuals mention that adults should take care of their diet, and on occasions they make recommendations for pregnant women, breastfeeding babies and even the elderly.

As far as breastfeeding is concerned, the doctors and wise men of the age all gave very similar advice. Children should be suckled by their mothers or by a wet nurse. According to Avenzoar, the mother should make sure that she eats correctly while she is breastfeeding her child. According to Ibn al-Jatīb (Ibn al-Jatīb, Muhammad ibn Abdallāh, 1984), children should be raised as much as possible on their mother's milk, because it contributes to faster development and is more appropriate. The amount of milk they are given should gradually be decreased and they should be weaned at 2 years of age, when their diet should be based on cow's milk, mild soups and breadcrumbs in stock.

Avenzoar makes an interesting remark about the pressure parents exert on their children to eat a great deal. According to him, they can put children off food, and their crying and complaining can tear the peritoneum, which they will have to put up with for the rest of their days.

The elderly are also received several recommendations about eating habits. For example, they are advised to consume digestible and nourishing food, as well as to eat less but more often. For example, Ibn al-Jatīb quotes the following phrase by Avicenna in his *Book of Hygiene*: 'They should eat in several sittings what is usually eaten in only one.' Averroes states that the elderly should eat three times a day, do relaxing exercise after each digestion has been completed, have massages and take baths. They are also told about the different sorts of food they should eat and the laxative effect of some food is repeatedly mentioned. Averroes recommends that they begin their meals with food that softens the abdomen. It may also be useful for them to take olive-oil enemas or eat figs with safflower or nettle seeds. Sometimes medicines need to be used to eliminate waste.

Food

According to the physicians of the age, no food or food groups are totally good or bad. Their effects can depend on a multiplicity of factors. Avenzoar, for instance, tells us something that is still valid today: 'Is there anybody who can say that there is nothing harmful among the great variety of food that they consume? This is inevitable and, despite everything, we still eat.'

When we analyse the food that made up the diet in that age, we can say that: (1) the diet must have been quite monotonous and unbalanced in the less fortunate social classes and in times of conflict; (2) the variety of food and the rich Andalusi gastronomy was outstanding for long periods both in the highest and the intermediate social classes; and (3) much of the food brought by the Arabs and consumed in al-Andalus has very probably contributed to defining what is now known as the Mediterranean diet.

The daily diet consisted of cereals that were eaten as bread, thick soups, porridge and semolinas; starch mixed with meat and cooked as purées; vegetables; fresh fruit and nuts; and salted and fresh fish in the coastal regions. Roast meat, meat pies and sweets were reserved for celebrations and special occasions. People from lowly backgrounds consumed little meat and, because it was cheap, often made do with the offal, which doctors said was highly nutritious.

Meat, fish and eggs

The most highly regarded meats were lamb and chicken. Suckling lamb and kid were thought to have the most pleasant taste and to be the most nutritious. Poultry was also commonly eaten, in particular chickens and hens. Stock made from these birds was recommended as a restorative for people who were ill or convalescing. Duck, goose, pigeon, partridge and even small birds were a habitual part of the diet. Game such as deer, wild boar, hare and rabbit was also eaten.

Pork was excluded from the diet because it was prohibited by Islam. Even so, physicians such as Maimonides mention it in their treatises and classify it as a good food, mild in taste, easily digestible and capable of producing urine and sweat. Other authors, such as Avenzoar, state quite clearly that they cannot speak of it because Islamic law forbids them from doing so.

Fish was another food that was consumed on a regular basis. Although it was not considered to be a food of great dietetic or gastronomic value, it was part of the diet of the people from more humble backgrounds, particularly in river or coastal areas. In Moorish Spain, it did not have the religious connotations that medieval Christianity gave to it and was regarded as just another food type in the diet. Consumption depended on the area, but particularly popular were sardines, tuna, grey mullet (*būrī*), shad (*sābal*), sturgeon, trout and red mullet. Because it was considered to be a cold, wet food, it was often fried or roasted to dry it out. It was also baked in the oven or stewed with spices such as saffron (*az-za'faran*).

For the poorer people, eggs were an important source of protein. The yolk was appreciated much more than the white, which was thought to be of no dietetic importance. Hen's eggs were the most popular although duck, pigeon and turkey eggs were also consumed. They were prepared as they are now – fried in olive oil, baked, boiled or poached – and they were also used as an ingredient in the most valued sweets.

Cereals and derivatives

Cereals, as in many other cultures, were the base of the diet in al-Andalus. They were eaten as soups, porridge or semolinas, but above all they were used to make bread.

Various types of wheat flour were used, the most common of which were *darmak* or flour blossom, very white and refined, and the so-called *juškār* or red flour, a type of flour that was unmilled and hardly sieved and used to make less nutritive wholemeal bread than the former type. Other cereals were also used to make bread. Barley and rice were the most highly regarded, after wheat, and even substituted it in times of shortage. The list of types of bread is completed by those made with cereals such as rye, sorghum or millet, all of which were regarded as being of little nutritive value.

The poor even made bread from roots, wild plants or acorns, even though they realized that these ingredients could be poisonous and that doctors recommended that they should not be eaten under any circumstances.

Cereals were also eaten in the form of macaroni (*atriyya*) or noodles (*fidawš*), which were cooked with meat or milk. One of the most popular dishes was *kuskus*, of Berber origin and which was made (and still is) with a semolina dough steamed and then boiled with meat stock or vegetables.

Maimonides believed that a diet of wholemeal cereals was the basis of correct nutrition. He explicitly forbade the consumption of refined flour and said that: 'Bread should be made from the whole grain, which should not be cleaned up or refined.'

Pulses

Known as poor man's meat, pulses were the source of protein and some vitamins for the poorer classes. Averroes classified many pulses as medicinal food, which gives us some idea of how he valued them. Broad beans, chick peas, lupin seeds, lentils or locally grown haricot beans (different from the ones grown in America) were eaten as purées and meat stews, and many were used to make bread. Their flatulent effects were well known and to compensate for this, it was advised that they should be cooked with thyme, cumin or ginger.

Dairy products

Milk, particularly sheep's and goat's milk, were regarded as being of considerable nutritional value. Fresh milk, skimmed milk, curds, cheeses and butter, which was normally salted, were all consumed. Cheese and curds were the most popular dairy products that could be bought in the souks. Cheese, because it was easy to transport and conserve, and dates were the basis of the diet for travellers and the Arabian armies.

Fruit and vegetables

The arrival of the Moors in the Iberian Peninsula caused a considerable change in agriculture. At the same time as they introduced and acclimatized new species, they improved and perfected farm work and watering techniques. These changes were completed by the appearance of literature on agronomy, which included agricultural treatises and calendars, and translations and compilations of ancient texts on agriculture. Moorish tables were set with a wide variety of fruit, vegetables, pulses and cereals, which was in stark contrast with the monotonous Christian diet based on cereals, red meat and wine.

Vegetables, by themselves or as ingredients in other dishes, were used to prepare the most renowned dishes of Andalusian cuisine. Of the vegetables introduced by the Arabs we should mention the artichoke (*jarshuf*), asparagus and aubergines (*bâdinyân*). The most common vegetables were spinach, runner beans, garlic, onions, carrots, chard (*silq*) and pumpkins, among many others. They were eaten as salads, dressed with olive oil, roasts, stews or accompanying meat or fish dishes. Broad beans and peas were eaten as thick purées.

The most highly regarded fruits by dietitians were figs and grapes, which were believed to improve the quality of the blood. Ibn al-Jatīb drew up an order in which fruit was to be eaten: figs, grapes, plums, apricots and similar fruit were

to be eaten before meals because they are digested quickly, whereas quince, apples, pomegranates and other astringent and acidic fruit in general should be eaten at the end because they are digested more slowly. Quince was known to be highly astringent, and its possible harmful effects were avoided by cooking and eating it with honey. The most popular fruits were pomegranates, watermelons, melons and citrus fruits, such as bitter oranges (*nārany*) and lemons (*laymun*). They were eaten as fresh fruit, sauces, marmalades and syrups (*xarab*). They were also used to make sherbets (*sherbet*) by mixing fruit and the essence of flowers with cold water or ice.

Nuts

Like today, nuts were regarded as having a high energy value and it was recommended that they should be eaten at the end of a meal. For Avenzoar, the best nuts were almonds because they hydrated the skin and beautified the complexion. Throughout the Middle Ages, almond milk was used as a remedy for numerous diseases. The nuts most commonly eaten were almonds, hazelnuts, acorns, chestnuts, walnuts, pine nuts and pistachio nuts.

Sweets

Sweets were highly appreciated and eaten by all social classes. Most of them were made of eggs, nuts, oil, sugar and honey. Even though honey had been replaced by sugar cane as a sweetener, it was still often used and highly prized. Honey was believed to be healthy and to cure illnesses. Most of the sweets currently consumed in Spain have their roots in al-Andalus.

Condiments and spices

Spices, a source of antioxidants and other phytochemicals, were used so much in Andalusí cuisine that they became its characteristic feature, the essence and the aroma of its food. Many were from China, Persia and India, and they played a part in the development of an exquisite gastronomy at the same time as they served to boost the economy thanks to trade with Europe and North Africa. Among many other spices, mustard, ginger, cinnamon, nutmeg, saffron and cloves all arrived in the Peninsula. Also in common use were mint, lavender, cumin, oregano, coriander and parsley.

Meat, fish, vegetables and sweets were regularly seasoned and cooked with spices. Unlike other civilizations, such as the Romans, which used spices to conceal the fact that the food was off, in al-Andalus they were used to heighten flavours and make meals tastier and more attractive.

Coriander and cumin (*kammún*) were the most representative spices of Andalusí cooking and they were recommended by doctors to alleviate stomach pains and aid digestion. Physicians such as Averroes or Ibn al-Jatib defined spices as excellent medicinal foods, which could act as pain killers and laxatives, and help to alleviate many conditions.

Fats

Throughout the Mediterranean area, olive oil was the most commonly consumed fat. Ibn Zuhr stated that one of the

best oils is pure olive oil extracted from ripe olives. Averroes compares the nature of man and the nature of olive oil, and believes that it can heal and calm pain. The Arabs distinguished various sorts of oil extracted from the common olive: the oil from the fruit that was still green (*zayt al-unfāq*) and the oil from the ripe fruit (*zayt al-zaytūn*). The oils extracted from other vegetables were hardly used in cooking and they were practically all used as medicines.

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