

# The Effects of Fire in Human Life and in the Cuisine from the Paleolithic to the Modern Age

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## Abstract

Humans existed on earth 2.5 million years ago and took control of fire after their evolutionary transformations. As a result of consuming cooked meat, there was an increase in the size of the human brain, the use of hands and mental skills. With the beginning of the Neolithic period, the increasing bio-cultural and socio-cultural transformation of humans also affected food preparation, storage and kitchen tools. People started to produce to prepare and consume food, hunt animals and facilitate agriculture. In the past, in addition to frying meat, they found different cooking methods using tools such as fire pits, clay balls and earthenware. The food processing and preservation methods developed and widely used from the Paleolithic period to the Neolithic period are cooking, grinding, drying, salting, seasoning, cheese-yoghurt, oil/sugar storage and fermentation processes, which are explained in detail in the article. As a result of the research, it was seen that all of these methods interacted with fire (and heat) to a greater or lesser extent. The (basic) cooking methods of food include (dry heat) frying, roasting, smoking, (wet heat) boiling, simmering and perhaps steaming. Changes in human eating habits appear to affect body size, digestion and health conditions.

**Keywords:** Cultural Transformation, Culinary Culture, Food Preparation, Preservation and Cooking Methods.

## Introduction

It is accepted that the origins of humankind extend to Africa and date back to 3.0-2.5 million years ago, and that the first humans (*Homo habilis* and *Australopithecus africanus*) spread all over the world from here. The places where our first ancestors lived are the places where there were rivers, lakes and dense forests that emerged with climate change (Özbek, 2020: 83; Klein, 2009: 131; Braidwood, 2008: 13, 41; Curtis, 2000: 4, 18). In these areas, they fed on fruits, seeds, plant shoots, leaves, roots, tubers and forest nuts. The bio-cultural evolution of humans began to shape their eating habits (Ünsal, 2020: 26). Consumption of red meat and fish has greatly contributed to the development of humanoid species (Özbek, 2020: 85). At first, people used natural caves to protect themselves from wild animals with their families or friends, where they shared their food and slept. First, communication and interaction with other people and friends occurred during meal conversations. The first helping and sharing of food took place here (Ünsal, 2020; Shea, 2017: 146; Sutton, 2016).

There is a close relationship between human nutrition and bio-cultural change. While other living beings have more advanced abilities to provide their own food in nature, humans do not have such a physical advantage. The difference of humans has emerged with their brains and intelligence, which enable them to think. Humans have managed to produce tools and technology with their ability to think. Thus, civilization and of course culinary culture have emerged. In order to consume plant and animal foods, they need to be constructed culturally (Atalay and Hastorf, 2006: 283). While the digestive systems of other livings allow them to consume only certain foods, the human stomach has evolved to a state where it can digest everything from raw to cooked, from meat to plants.

The first traces of humans in Mesopotamia, one of the first human settlements, date back to the Paleolithic age (Nissen, 2015: 20). Mesopotamia is derived from the words “mesos (middle)” and “potamos (river)” to describe the area between the Euphrates and Tigris rivers (Köroğlu, 2009: 12). As the name suggests, people have mostly preferred waterside areas to continue their lives. With the spread of people from here to the world, humanity and its culture also began to spread. The spread of people to the world has occurred in

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the last 60,000 years (Boyd, Richerson, and Henrich, 2011: 10918). There are two main agricultural regions in the world where agriculture has spread from ancient times to the present day. These are the “Fertile Crescent”, which includes Mesopotamia and the Eastern Mediterranean, and certain regions of China. These regions are also the main source of the languages spoken by 90% of the world's population, which belong to one of the seven language families (Standage, 2020: 41-42). The first written laws, mathematics, medicine, fortune telling and magic emerged here, and sculptures, reliefs, jewelry and small handicrafts, potter's wheels, cart wheels, plows, sailing boats, building arches and vaults that show technological progress were gifted to human culture from here. In Mesopotamia, adobe, which is mixed clay, was used as a building material (Köroğlu, 2009: 13-14). One of the important stones that constitute the raw material of the tools produced by prehistoric people is obsidian, and it has the feature of being processed by pressure and hitting (Glascock, 2020: 36). However, since the stones required for tool technology (obsidian, volcanic glass, flint) were not available in the region, they had to be brought from far away. (Köroğlu, 2009: 19; Nissen and Heine, 2009: 3) Houses in Mesopotamia generally consisted of stone foundations, adobe or wattle and daub walls (Köroğlu, 2009: 40).

It is known that early humans made and used sharp-edged tools and drills by carving materials such as pebbles, quartz, quartzite, and flint stone 2.6 million years ago (Ma, 2024). In simple terms, these stones, which were the first kitchen tools, were produced in Ethiopia and Tanzania (Özbek, 2020: 93; Klein, 2009: 249). With these tools, meat is cut into small pieces, and the bones and skin are removed, making it easier to consume (Civitello, 2011: 3). In fact, it has been stated that cattle, sheep, goat and pork have been consumed in human nutrition since the beginning of time, and that these meat sources were essential nutrients for life in the Neolithic period (Özbek, 2020: 95; Metheny and Beaudry, 2015: 309; Toussaint-Samat, 2008: 88).

As a result of climate change on Earth (18,000-9,000 BC), the weather warmed and the glaciers melted, creating a suitable environment for agriculture (Standage, 2020: 37). People who started farming gained some advantages by switching from hunter-gatherer to village life. These can be listed as; sharing food through socialization, better protection of their babies, and decreasing infant mortality rates. The negative aspects of living together are the risk of infectious diseases, the additional costs of transporting fuel, food and other resources to the settled area due to being stationary. It has been stated that people rarely feel the need to move to other places unless they have to, unless there is war, chaos etc., and that travelers tend to settle down (Shea, 2017: 146). Living together has brought about sharing of work, regular food supply, protection from aggressive animals, and the opportunity to catch larger and more game in less time by hunting with a group. With collective food supply, there is also a tendency towards high-quality food and food supply from a wider area. The coming together of people with other people who are not related has led to the formation of large social networks (Sutton, 2016: 360), and people's social learning capacities have improved and 'cumulative culture' has emerged (Hill et al., 2011: 1286). However, when the number of people living together exceeds 150, communication becomes weaker, management becomes more difficult and may cause chaos (Dunbar, 1992: 469). Cultural development continued when people settled down. Previously, they lived in natural caves and shelters, but with the settled down, they used the raw materials they obtained from nature in the construction of shelters. As is common in the Near East, walls, roofs and other architectural elements were made of adobe (Stevanovic, 2006: 157). For example, people built houses in Çatalhöyük (7,500-5,600 BC) consisting of one or two sections, a main room used for protection from heat in summer and cold in winter, for tool production, cooking, eating and sleeping, and another room used for storage and food preparation (Hodder, 2006: 11). The structure of the houses was built with adobe bricks made of clay soil (Stevanovic, 2006: 158). Although people initially used these building materials by applying heat treatment, from 6,000 BC onwards, burnt brick became widespread (Wright, 2005: 108).

People have developed a ‘nutrition strategy’ according to the conditions they are in. In cold places, they mainly consumed game and fish, while in rainier, temperate places, they consumed nuts and fruits and vegetables by taking advantage of the rich vegetation. With the discovery of fire, food was prepared according to the food available. If the available food was animal products, it was mostly animal-based meals that were cooked and eaten, while in places where fruit, vegetables or grains were more common, the foods

cooked were of plant origin. Since people are social beings, a group of people must have felt the need to get together with other people. Thus, unrelated people started to live together, and there was a cultural exchange in terms of nutrition with those who joined the group later.

At the beginning of the Holocene period, with the climate becoming more stable, agriculture starting and food stocks increasing after the transition to settled life, a family environment was formed, excess food and time triggered population growth and enabled people to form small communities (Standage, 2020: 39; Norenzayan et al., 2016: 2). Gatherers probably implemented the most efficient form of production by taking what they found in nature. Organizing and producing technology to use resources comes into play, as does ownership (Johnson and Earle, 2000: 54). The food surplus produced has brought about a very rapid population growth all over the world, which has caused social changes such as urbanization (Barker, 2009: 447). These changes have occurred in a very short time compared to the entire history of humanity, and have occurred in the form of a “big bang”, a great leap forward in sociocultural terms (Klein, 2002: 161). Population growth has brought more work specializations for social needs, human relations have become more frequent with people outside the family, and more interaction has brought more cultural accumulation (Braidwood, 2008: 207). With people living together, cultural development and social production such as food preparation and cooking, stone and bone bead making, basket weaving, and the production of tools such as obsidian knives and cutting tools have come into play (Farid, 2006: 169). In communities living together, as the population increased, the possibility of migration to other places increased, and thus all the cultural values acquired were offered for exchange with other people. Everything from the process of making existing tools to the sharing of fire was subject to change, and (in more recent times) cooking techniques used in the kitchen became widespread.

It has required people to learn and know the characteristics of natural resources, that is, all kinds of plants and animals to be used for cultural development and tool and technological production (Mitchell, 2009: 419). It has accumulated the knowledge and behaviors that people have learned over generations (Boyd and Richerson, 2005: 52). For example, sufficient information was gathered about the reproductive behavior of animals and the growth cycle of plants, and this led to ‘cumulative cultural development’ (Nissen and Heine, 2009: 9). Cultural evolution, cumulative culture, has been achieved by people learning from each other over the last million years or more (Boyd and Richerson, 2009: 3281).

There is increasing interest in studies on food processing and preparation methods, that is, the collection and cultivation of food, and the transformation of existing animal and especially plant-based materials into food, created by the social and cultural lives of prehistoric people (Arranz-Otaegui et al., 2024; Brown, 2024; Neubauer, 2024; van Limbergen and Dodd, 2024; Casucci, 2023; Cramp et al., 2023; Duke, 2023; Oas, 2023; Peres, 2023; Sinensky, 2023; Srivastava and Chandra, 2023a, 2023b; Vroom, 2023). In this study, the effect of fire on the biological and cultural evolution process that humanity has undergone from its existence to the present day has been discussed. For this purpose, information from the perspectives of sociology, archaeology, anthropology, gastronomy, food science and medical sciences has been used in general, and in particular, it has been aimed to draw attention to the issues of food processing, preservation and kitchenware from the perspective of gastronomy and food science and technology. The effects of culture, which is the output of all human activities, have been determined in terms of gastronomy, and food processing and preservation methods have been explained.

#### *Research Aim and Material-Methods*

The study used the document review method. This study presents together the changes brought about by the impact of fire on human life in terms of gastronomy, archaeology, anthropology, nutrition and dietetics, food science and technology and provides a multidisciplinary perspective. Additionally, food preparation methods that emerged with cultural change are discussed.

#### *The invention and Use of Fire*

Prehistoric periods are divided into general sub-sections covering different dates. While some classify the part from the existence of humanity to the Neolithic period as roughly 2.5 million-10 thousand years, others

divide it into similar periods. Accordingly, the Paleolithic Period is divided into periods as (subdivided into) Early or Lower Paleolithic, Middle Paleolithic, and Late or Upper Paleolithic (Curtis, 2000: 3; Shea, 2013: 7). Historical periods and important events are given in Table 1. The more recent period, known as the Early Holocene period in geology and the Neolithic period (New Stone Age) in archaeology, is a period in which the climate is ice-free, relatively warm, and stable, and polished stone tools are produced, cultural activities increase, and agricultural practices and plants and animals are domesticated (Boyd and Richerson, 2005: 67; Curtis, 2000: 4).

**Table 1. Major Periods of Levantine Stone Age Prehistory (Shea, 2013: 7)**

Period	Dates	Major Evolutionary Events
Lower Paleolithic	>1,400,000–245,000 BP (>1.4–0.3 Ma)	Origin of Genus Homo. Increased evidence for hominin carnivory. First hominin dispersals beyond Africa. Controlled use of fire begins.
Middle Paleolithic	245,000–45,000 BP (245–45 Ka cal. BP)	Origins of Homo sapiens and Neanderthals. Homo sapiens dispersal into southern Asia. First evidence of exosomatic symbol use (mineral pigments, personal adornments, burials). Evidence for systematic hunting of large game.
Upper Paleolithic	45,000–24,000 BP (45–24 Ka cal. BP)	Homo sapiens adaptive radiation into western Eurasia. Widening ecological niche including systematic collection of small game. Extinction of Neanderthals. First evidence of freestanding architecture.
Epipaleolithic	24,000–12,200 BP	Increasing sedentism and ecological intensification among hunter-gatherers. Increased use of groundstone tools for in-bulk processing of wild grasses. Domestication of the wolf/dog.
Neolithic	12,200–6500 BP	Monumental architecture. Domestication of cereal grasses (wheat, barley). Domestication of sheep, goat, cattle. First villages, ceramics. Regional patterns of symbolic artifacts suggest organized religion.

Fire is a source found in nature and is formed in nature by lava flowing from volcanoes, friction with lightning and self-ignition. The use of fire by humans can be listed in three categories: i) use of a newly formed fire (lightning), ii) use of a burning fire by carrying it, iii) production of fire by friction at will. The ability to light a fire provides flexibility in the use of fire. The act of lighting a fire shows that humans have developed cognitive skills. Lighting a fire can be done by hitting stones together, rubbing materials such as wood and stones together and rapidly rotating a thin stick in a hole opened on wood (Gowlett, 2020: 5331). Sandgathe (2017) defined human use of fire in four stages: 1) habituation to natural fire, 2) use of fire, 3) maintenance of fire, and 4) manufacture of fire (Sorensen, 2019). Fire has been used since ancient times for purposes such as protection from cold and animals, providing light, repelling insects and parasites, establishing social communication around it, processing wood and stone (later glass, metal, etc.), melting adhesive materials, and cooking (Sorensen, 2019: 13). Fire is thought to have been brought under control by *Homo sapiens* by 200,000 years ago (250,000-180,000). Archaeological remains date back to 790,000 years ago, including charred bones (Swartkrans in South Africa), clay lumps heated at high temperatures in a campfire (Chesowanja in Kenya), rocks heated in a hearth (Gadeb in Ethiopia), and hand axes and bones (Gesher Benot Ya'aqov in Israel) (Kuman, 2020: 9; Wrangham, 2010: 85, 87). In recent studies, it has been stated that fire was brought under control in the Lower Paleolithic period (Wrangham, 2017: 303).

The movement of human beings from one place to another has been realized through their movements. While migration is the “movement of the entire community to one place”, diffusion has been expressed as “the coming together of small groups in one place through movement” (Shea, 2017: 111). When the first people started using fire, they probably took fire with them when they migrated north from Africa to Europe and east, India, China and Southeast Asia due to reasons such as famine etc. Early civilizations were formed in Mesopotamia, Egypt, China and India (Civitello, 2011: 3, 25). People and civilization spread to the world with these civilizations.

In the Paleolithic era, people consumed meat by eating small animals they could catch or the remains of large animal carcasses raw before cooking them. Just like the first humans eating carrion, even today a product consumed as food in one culture (for example, the French eating frog legs) is treated as disgusting or repulsive in another culture when it is considered inedible. It can be said that with the discovery of fire, a radical change began in human nutrition, or in taste (Outram, 2018: 40), and in a broader sense, in culinary culture. A person's taste develops in the direction of what he/she eats in the culture he/she lives in at a young age, and he/she continues to consume the same things in adulthood (Outram, 2018: 42). One of the most important factors that determines people's nutritional strategies is the ecosystem they live in, as well as the religious beliefs and rituals they have. For example, while meat is indispensable for many societies, cows are highly respected in India and are never considered for food purposes (Fumey and Etcheverria, 2007: 15).

People started to make tools from stone, cut meat into smaller pieces, and separated the meat by skinning it. With the first use of fire, a constantly burning fire probably needed to be maintained so that it would not go out. This need led to the emergence of a profession, the person responsible for the fire. If we assume that people probably had people who could cut meat better do it, then the first specialized professions were butcher and fire keeper (Civitello, 2011: 3). As the historical ages came, specialized professions included animal husbandry (10,000 BC) and farmers (8-10,000 BC). Until a significant part of the Neolithic Age, the main activities of people were food production (agriculture-animal husbandry), clay pot production (pottery expertise) and precious jewelry production. In every place where there was human presence, these were the most important activities, in other words, the cultural current of the period. High level of cultural accumulation has brought about the emergence of specialized skills. It is seen that blacksmiths started to emerge after the pottery profession (Nissen, 2015: 51). While men did the hunting or food-fetching work, women who stayed at home (in the cave) with the children were the first cooks by preparing and cooking food (Crown, 2000). From the Paleolithic period onwards, the cooking function was carried out by women who had less social status and power (Graff, 2020: 339). Today, cooking and most of the housework are done by women, and as a result, mothers continue to pass on their cooking skills from generation to generation (Caraher et al., 1999: 590).

### *Effects of Fire on Human Life*

#### *Cultural Change*

In dictionaries (Cambridge, Oxford, Britannica), culture is defined as the totality of the material and spiritual means produced by a certain group of people in a certain period of time within the historical and social development process, namely, lifestyle, attitudes, behaviors, views, language, ideas, beliefs, traditions, codes, institutions, tools, techniques, works of art, rituals and ceremonies. Culture is very important for understanding human behavior. Culturally acquired information and the biological aspect of man intertwine and shape human evolution (Koerich and Müller, 2022; Boyd, Richerson and Henrich, 2011: 10919; Richerson, and Boyd, 2005: 3,4). “Humans at all levels of social complexity are highly intelligent and continually creative” . It is seen that man can always evolve and adapt to every part of the world thanks to his cultural creativity (Johnson and Earle, 2000: 52).

Cultural change began with the emergence of civilization, and the discovery of fire accelerated the process. According to Pollan, civilization occurred with the control of fire (Pollan, 2014: 30). While the use of fire in food preparation was considered a cultural symbol, the consumption of raw food was expressed as barbarism (Ünsal, 2020). It has been stated that Claude Lévi-Strauss sees cooking as the key

to understanding the transition of man from nature to culture (Sutton, 2016: 350). Food can be found in nature as three cultural categories: raw, rotten or cooked (Atalay and Hastorf, 2006: 284). Food is transformed with cultural codes. The blending and preparation of food with culture constitutes gastronomic culture (Koerich and Müller, 2022).

As a result of the bio-cultural nutrition that began with the discovery of fire, the evolution of human beings towards humanization began (Özbek, 2020: 25). Reaching today's level of civilization was possible with the “domestication of fire” and the “cultural change of nutrition”, which were one of the first steps taken by human beings. Foods often have rich social and cultural meanings (Graff and Rodríguez-Alegría, 2012: 241). It is quite appropriate to express culturally specific social structures and ideologies with food (Twiss, 2012: 360). Foods can contain many facts such as status, ethnicity, gender and religion, different diets, food activities, rituals (Twiss, 2012: 357). It has been stated that culture will be meaningful together with society. Human societies are the basic key to cultural evolution (Richerson and Boyd, 2005: 5).

Religious traditions and roles create social interaction with the detailed information they contain (Richerson and Boyd, 2005: 61). It is stated that the taste perceived from foods, the values attributed to them, the expectation of health and the approach as taboo emerge with social interaction (Crown, 2000; as cited in Graff, 2020: 341). While the bonds between people are strengthened by sharing the food produced as a result of social interaction, resistance can be created and chaos can be caused by offering poisonous food (Graff, 2020: 342).

Graff, (2020: 341) “*Since food preparation, such as cooking, is an activity that is embedded in all aspects of society, studying food preparation can elucidate social organization in the household and in the community, the organization of production, economic practices, ritual practices, gendered practices, identities, politics, taste, and power*”. Teaching others how to cook also means teaching and transferring cultural facts of social importance. Items that can be mentioned as prehistoric cultural remains include tools made of materials such as stone, wood, bone, horn, weapons and war materials, settlements, graves and burials of the dead, remains showing religious beliefs, paintings carved into caves, simple musical instruments, art activities, etc (Braidwood, 2008: 45). Cultural activities of people have led to the emergence of concrete objects.

The nutrition of a person, that is, the eating and drinking activity that begins with birth, can be seen as a simple physiological need. However, even in simple societies/communities, it is seen that the nutrition activity is not just a simple eating and drinking activity, but a feast, a ritual, a means of communication (Özbek, 2020: 37). In fact, the act of eating and drinking has been given many meanings. Since the existence of humanity, the act of eating and drinking, especially some foods, has been a symbol and consumed as part of a ritual. The act of cooking, with the control and use of fire, has affected people's behaviors such as storing and transferring information, communication and cooperation (Wrangham, 2017: 311).

With the invention of fire, the time spent searching for food decreased due to the increase in energy obtained from meals, and people spent more time thinking. People began to come together more with food distribution and cooking activities. The beginning of cultural development increased the contact of human groups. The number of people living in a group increased. People interacting with each other more caused diseases such as tuberculosis, cholera and malaria to spread. In addition, animal diseases such as brucellosis increased with the consumption of raw animal meat. Pathogenic microorganisms found in raw milk posed serious threats to human health (van Doren, 2021: 100; Özbek, 2020: 28).

Food preparation is a process created with cultural codes (Graff, 2020: 341) and is a symbol of class, religious or ethnic identities, and at the same time, food becomes a metaphor (Ünsal, 2020: 28-30). Cooking is a cultural phenomenon and is thought to be related to concepts such as gender, power, values, space, time, tradition, modernity, embodied skill, memory, mastery-apprenticeship (Sutton, 2016: 353-364). Food has become both a form of nutrition and a way of thinking (Ünsal, 2020: 28). The act of transforming raw food in nature into cooked food, which is a cultural activity by man's intervention in the form of crushing, cutting, etc., is achieved through the craftsman and cook who uses knowledge, skills and tools (Pollan, 2014: 47). The decrease in time spent on food preparation has contributed to the

recognition of nature, the identification of the healing properties of nearby herbs and other cultural activities.

The more widespread use of fire, the cooking of a wider variety of foods on fire, and the migration and transportation of groups from one place to another have resulted in interaction and cultural change. The transfer of fire from one place to another has fundamentally led to the spread and enrichment of humanity's culinary culture. The transformation of food by fire through cooking is a cultural formation and change, and the invention of simple kitchen utensils that can be used with fire is a continuation of cultural development. First, it was necessary to design a boiling pit, think about the design of the skewer, clay pots and cauldron and make it concrete. For example, it was emphasized that the processes of boiling or frying meant the formation of civilization (Fernández-Armesto, 2002: 17). The human digestive system has a structure that can digest almost everything, which has allowed it to adapt to all corners of the world, develop a “nutrition culture” and determine its “nutrition strategy” accordingly. The most important feature that distinguishes humans from other animals, which is their intelligence and ability to think, and the technological movement that started with simple tools, equipment and weapons, have enabled them to obtain food more easily and in greater quantities. For example, the cultivation of grain in agricultural activities requires a certain cultural background. For example, the right amount of grain must be planted in the right soil at the right time, and there must be enough water so that the seed can germinate and, if everything is in place, harvest can be achieved without problems of human or animal infestation, disease or drought (Nissen, 2015: 28). In addition, in agriculture, barley was two-row in the wild production stage, but with the transition to artificial irrigation, the six-row type has caused a multi-fold increase in yield with its full adaptation to environmental changes (Nissen, 2015: 70). More food production has enabled storage, and access to more food has brought about being healthy and spending more time thinking.

It is claimed that cooking food indicates cultural development, but rather that the degree of transformation and cooking of food corresponds to the degree of separation between humans and nature (natural). For this reason, people aim to be part of nature with a raw food diet. In a sense, eating a raw food diet is a way of condemning the effects of cultural change (Thircuir, 2020: 519). The term “raw food” used today has been somewhat removed from its past meaning, meaning it has undergone a cultural change. In other words, many fruits and vegetables consumed raw are now consumed by partial processing, such as cutting into pieces and making salads (Fernández-Armesto, 2002: 6).

### *Artistic Change*

It has been estimated by Wrangham that cooking food saves four hours a day from the time spent on filling the stomach (Pollan, 2014: 51). This has allowed for more thinking in the remaining time. Culture emerges after people's behavior, and cultural differences provide people's diversity (Richerson and Boyd, 2005: 14, 20). It is possible to observe that the first works of art in the name of painting and sculpture were created with the beginning of the cultural change of thinking man. As the time allocated for eating decreased, man began to think in the remaining free time and began to reflect his ideas on concrete objects. First, around 100,000 BC, works such as necklaces made of red ocher, shaped bones and pierced mussel shells began to appear, in a sense, the “Paleolithic art movement” began (Von Petzinger, 2017: 73). Paleolithic art reflects the spiritual activities of the society and, in a sense, the culture of that period, with its depictions of “successful hunting scenes, respect for animals, rituals and prayer” (Ma, 2024: 54). These can consist of drawings such as pictures, shapes, engravings, etc. on caves or rocks, as well as being processed on materials such as portable personal items and weapons. Drawings can be in the form of an event or storytelling, or they can include abstract expressions consisting of simple dots, lines, and shapes (Cooke, Tripp and Von Petzinger, 2020: 1012; Von Petzinger, 2017). In the earliest periods, animals were depicted more frequently than humans. Only 20 out of 1000 drawings made on the walls of French and Spanish caves were of human figures (Toussaint-Samat, 2008: 66). In more recent periods, abstract and geometric shapes, flower motifs, and animal pictures were carved on war tools such as knives, sharpeners, spear throwers, harpoons, and on portable or fixed cave walls with the help of hard materials such as stone, bone, and horn (Braidwood, 2008: 105). Perhaps, practices that could be called “Neolithic art movement” have also been found. For example, it is known that wall paintings, reliefs and sculptures of

animals such as bulls, cattle, deer, goats and vultures were made in the houses in Çatalhöyük (Hodder, 2006: 11; Russell, 2006: 185).

People living in Blombos Cave in South Africa, 100,000 years ago, made abstract design art works that date back to the oldest date, using ochre dyes. It has been seen that this requires much more than just applying a colored plant to a place and painting it. People produced the dye they used with basic chemistry, the know-how that their ancestors thought and carried to that day. First, the bones were boiled to extract the marrow oil, and the crushed bones were pulverized on grinding stones, and the “pigment composition” was obtained by mixing ochre, ground charcoal and water with the mixer (bone). Finally, “cave art” was performed. The ochre was also used intentionally to paint the bone pieces (Von Petzinger, 2017: 74, 77). It has also been determined that people used seashells by piercing them, painting them with ochre, and using them for aesthetic purposes, as decoration, or as a means of personal identification (Von Petzinger, 2017: 78-81). It is seen that red ochre was used in painting beads and ornaments, tools made of flint, bone and horn, and was sprinkled on the buried dead. It is understood from the detailed colored drawings of the designed animals that the animals were energetic, knew their dangers to humans, their strength, their fur structure, etc., and that the artist created the painting with a sensitive eye and good observation (Braidwood, 2008: 106-107; Toussaint-Samat, 2008: 67). It has been stated that ochre dyes have red color and other pigmented black colored substances and may have been used as antibiotics, tanning agents, to hold stone tools to wooden handles, adhesives, emulsifiers and hardeners (Klein, 2009: 537).

#### *Change in Religious and Ritual Terms*

Humans have needed a ritual or religious belief almost throughout history. In the early ages of history, prosocial religions, exaggerated rituals and devotion to great gods emerged (Norenzayan et al., 2016: 3). In the Paleolithic ages, the descent of fire from the sky (lightning) allowed fire to enter the worship. Fire has maintained its place as a sacred being for people for a long time (Klein and Edgar, 2002: 156, Civitello, 2019: 3). Today, in some societies, fire maintains its religious importance (Sam, Avandi, and Kianpor, 2023). The myths of fire coming from the sky are also found in many societies. According to one myth, humans stole fire from God. For reasons like these, it is necessary to offer them valuable food in order not to anger them. Perhaps the basis of cooking can be based on the cooking of animal meat sacrificed over fire in order to convey its smoke to God, as stated in many holy texts since the time of Cain and Abel (Pollan, 2016: 37). Cooking meat over fire and offering it to God is not only a sign of obedience, but also a ritual that allows people to come together for a religious ceremony (Pollan, 2016: 38). Foods that are frequently found in people's rituals are basic foods such as meat and bread, which are considered sacred. In order to show respect to the gods, sacrificial meat roasted over fire or bread cooked over fire were among the most sacred (Fumey and Etcheverria, 2007: 48). Foods prepared with care were often offered to the gods in rituals.

Food preparation processes, the ritual of food steam and smoke rising up to reach the gods are seen as activities that mean communication with heaven-earth-god in many cultures. “Life is measured in ritual meals.” (Fernández-Armesto, 2002: 5). Activities include fire (dance) rituals, Nevruz, and feasts and worships such as cooking and offering meat.

Cooking has a social function, not just to make food edible, but to bring people together around food at mealtimes. Eating together also constitutes a ritual of social adhesion (Fernández-Armesto, 2002: 5). Food also includes meanings such as social communication tool, heritage from past to present, hospitality, drawing social boundaries, separating or uniting people, superiority, competition, identity, religious orientation (Ünsal, 2020: 54-71). Food rituals connect people to invisible beings, interpret holiness and respect stories (Mintz and Du Bois, 2002: 107).

Meat is a powerful food that gives strength and has been used as a symbol of power, energy and authority (Ünsal, 2020: 46). On the contrary, in some societies, meat is often encountered in fasting-like diets to purify the soul and body. In order to worship God or avoid prohibitions, many societies do not consume meat ritually and religiously, or it is forbidden to eat it raw. For example, beef is avoided in India, pork in Islam, and chicken meat is avoided in some regions of Africa and Asia. The effect of fire is undeniable,



as it affects beliefs in every field (Fumey and Etcheverria, 2007: 48). Fire is also frequently found in burial rituals. In addition, there are stone and wooden vessels, face painting and decoration tools, bone belt buckles, and tools made of stones buried next to the dead. Their burial was due to beliefs such as respect for the dead or that they would need the items after they were resurrected (Nissen, 2015: 41).

### *Equipment Development*

Chimpanzees, bonobos, gorillas, orangutans and macaques use tools in nature (Shea, 2017: 17). While the tool use of other creatures in nature is simple, the tools produced by humans are much more functional. It has been determined that the area used for language and the area used for tool use in the human brain are the same. Just as the language changes according to the region where it is spoken, tools are specific to the region where it is valid (Shea, 2017: 87-88). Even in stone making, which can be described as very simple, only humans, compared to other animals, contribute to the work with aesthetics and culture. It must have been felt that tools were needed to make daily life easier, and when they were free, thinking humans began to produce tools. As humans developed from the Paleolithic period to historical times, they used many different materials to make tools, and tools were commonly made from materials such as bone, wood, and stone. Stone types used in tool making can be listed as obsidian, basalt, rhyolite, felsite, chert/flint, shale, chalcedony, jasper, limestone, quartzite, quartz, glass and ceramics (Shea, 2017: 21). At the beginning of history, humans probably first started to produce tools from wood, stone, and mud, and then transitioned to metal, glass, and other materials (Ma, 2024: 52-53; Wright, 2005).

In order for a human to produce certain tools, he must be in communication with another human. Humans, who are different in intelligence from other creatures in nature, can exhibit more complex behavior. In fact, humans have begun to produce things. Shea (2017: 90) gives the following as examples: “*These activities include manufacturing glue and hafted stone tools (Wadley 2010, Barham 2013), mortuary rituals (Petitt, 2010), personal adornment (d’Errico et al., 2005; Bouzougar et al., 2007), complex pyrotechnology – including heat treatment of stone tools (Brown et al. 2009), thermally induced color alteration of mineral pigments (Hovers et al., 2003), as well as astronomically scheduled exploitation of marine resources (Marean et al., 2007)*”.

The first humans were hunters, which led to the emergence of tools and technology. Humans, who were helpless against the power of animals, felt the need to use their minds and make tools. After the first tools, agriculture, cave-house needs, and the development of tools and equipment to facilitate the processing of hunted animals became continuous. It has been determined that even large animals such as mammoths were hunted with trap pits opened on animal paths and fires large enough to scare animals and direct them in one direction (Toussaint-Samat, 2008: 67).

While fire has functions such as cooking and heating, it has also been used to change the structure of materials, for example in the production of stone tools (Wright, 2005: 9). On the other hand, the production and use of stone tools have also been encountered in communities living in early periods without fire (Shea, 2017: 112). It has been determined that *A. africanus*, which can be considered the first human, had the ability to make and use stone tools 2.6 million years ago. The first simple stone tools can be listed as hammerstones, core forms, flakes, choppers, and discoids (Klein, 2009: 251-255). Fiery furnaces were used (Wright, 2005: 10) to perform processes such as improving the flaking quality of stone, producing compound adhesives, baking clay for ceramics and heating ores (Henshilwood and Lombard, 2014: 125). In addition to these, it has been stated that stone lamps with hair or fiber wicks and a cavity into which vegetable or animal oil could be placed may have been used for lighting purposes (Braidwood, 2008: 105).

### *Kitchen Utensils*

“Culture is (mostly) information in brains”. People realize cumulative culture by transferring it to other brains through various social learning processes (Richerson and Boyd, 2005: 61). Human beings have undergone a cultural evolution by concentrating on abstract thought and evolving from simple containers made of building materials such as stone and clay (Wright, 2005: 10) to more advanced forms. By creating

a cumulative culture, humans have become able to invent things that they could not invent on their own, such as tools, practices and beliefs (Boyd, Richerson, and Henrich, 2011: 10918; Boyd and Richerson, 2005: 54). The food that people eat or the tools they use to produce it provide symbolic information. Food production and its tools create social memory and symbolic values. It has been stated that the interaction between food and ritual, food consumption and social change are important issues in food ethnographies (Mintz and Du Bois, 2002: 99). In every period and every culture, people's rich knowledge has been encoded into objects (materials) (Richerson and Boyd, 2005: 62). When fire was first used, appropriate tools and equipment began to be developed, and when wheat was domesticated and cultivated, appropriate tools for harvesting and grinding were invented. As new tools emerged, new processing and cooking methods were also developed.

The kitchen utensils used by people in the Paleolithic period can be listed as cooking pots, serving vessels, storage containers, or food preparation tools, soap stone, bows, curtain-like wick made of moss, harpoon (Graff, 2020: 345; Boyd, Richerson and Henrich, 2011: 10919). In addition, the “hot-stone griddle” was invented to cook food more gently without burning it. The stone was heated over fire and the food was cooked in the “hot-stone cookery”. The “cooking pit” was plastered with clay soil inside, making it easier to cook as a structure that could hold liquid and fire. The “tandır” is still used in many places in the world as an improved version of cooking pit (Fernández-Armesto, 2002: 13-15). Kitchen utensils such as spoons carved from wood and bone were among the utensils used in Paleolithic times (12,000-13,500 BC) (Metheny and Beaudry, 2015: 505). Shallow storage pits used as kitchen cabinets, clay balls (Farid, 2006: 168), fire shovels etc., close to the cooking area, can be listed as early period tools. Stone vessels with sooty exteriors used for cooking are positioned in a specific place in the kitchens (Graff, 2020: 344). Commonly, a cooking facility such as a hearth, fire pit or oven was used as the place where cooking took place. Clay balls were heated over a fire and placed in a ceramic pot, dug pit or basket filled with food and liquid to boil (Metheny and Beaudry, 2015: 33). Stonelined hearts and earth ovens were used to cook meat and plants, and boiling pits were used to extract oil from animal bones (Metheny and Beaudry, 2015: 164). Long before these, the skins, tripes, tails or stomachs of animals were stuffed to cook food, and the cooking process was carried out over fire (Fernández-Armesto, 2002: 15).

Clay, which is one of the materials that people first produced pots, has some advantages. These are countless shaping, increasing its durability by hardening through firing, kneading, carving, cutting, applying colored glaze or paint, and providing unlimited production variety. During the pottery period, pots made of clay (ceramic) can be produced in unlimited variety, and are among the materials that can best convey human emotions and be equipped with senses among human products (Nissen, 2015: 33-36). The fact that clay vessels produced by people living in different regions have different designs is seen as cultural diversity and cultural difference. Different behaviors create cultural diversity with different social learning. In archaeological excavations, it is important for different regions to have similar or different clay vessels in order to determine the relationships between the regions. The first technological breakthrough in the clay vessel production process is the use of the potter's wheel (Nissen, 2015: 56; Boyd and Richerson, 2005: 53). With the wheel, production has somehow accelerated. As can be seen, social learning and culture have brought about adaptation according to time and place (Boyd and Richerson, 2005: 70).

The controlled use of fire is an invention that allows cooking, heat and light production, and protection from animals. The technological use of fire has also made it possible to process ceramics and metals (Brown et al., 2009). The invention of fire has allowed the production of many new tools and equipment, and has also contributed to the emergence of new professions from ancient times to the modern age. When the Chalcolithic Age (7,500-5,500 BC) began to be processed, the shaping of the metals (copper, tin, and copper mixture; bronze, iron) and their transformation into a tool were under the influence of fire. Groups of people who processed these metals emerged, and professions such as blacksmiths, mine workers, and metallurgists emerged.

### *Change in Food Processing and Storage*

Food preparation is a comprehensive process that “*is a cycle of service, distribution and consumption, which involves one or more human labor and a cultural touch, and brings together people who grow, collect, process, store, cook and eat food socially*” (Graff and Rodríguez-Alegría, 2012: 232). During food preparation, processes such as crushing, peeling, cutting, hanging, drying, smoking, cracking, roasting, boiling, shredding and pounding extend the shelf life of the food (Hastorf, 2017: 91), and microbial spoilage is minimized and taste and aroma are developed by salting, sugaring, seasoning and oiling/preserving. People collect, hunt, produce food, eventually break it down, cook it, eat it and get rid of the leftovers (Twiss, 2012: 361). After humans discovered fire, they gathered various plants and foods from nature, added different amounts of spices to them and applied different cooking methods, and reached a thousand and one food options (Rosell and Blasco, 2019: 268). The food variety increased even more with the blending of animal and plant products.

The fact that not everyone in the communities spent time gathering or hunting food, only a few people were employed in agricultural activities, creating a surplus of labor. Excess manpower and free time allowed for tools to be designed with consideration, and more time to be devoted to kitchen activities. The act of cooking separates humans from other creatures in nature (Pollan, 2014: 46). Man has managed to defeat nature with fire (Brillat-Savarin, 2018: 233), fire has given life to man (Wright, 2005: 27). Foods prepared using fire can be transported to other places, food can be accessed in extreme weather conditions, a more regular and balanced diet, and better care for babies and patients, providing a sense of security and well-being (Hastorf, 2017: 91).

According to Goody's (1982:97) definition, the nutritional status of people has transformed from low cuisine, where simple foods are prepared with basic ingredients used daily, to high cuisine, where a few cooks carefully prepare rare ingredients that have survived to the present day almost perfectly. With the invention of fire, food preparation in the kitchen has become faster. With the consumption of nutritious and rich foods, the time required to search for and prepare new foods has decreased considerably. This extra time left to people has enabled them to think and invent tools. In addition, the increased use of fire in food preparation has formed the basis of cooking techniques that have brought about the richness of culinary culture. As a result, some basic principles of food technology began to emerge with kitchen utensils and equipment that emerged with thought. As we approach the present day, increasing technological development has also tremendously improved kitchen techniques and technology. “Food processing is probably the most fundamental structuring structure in human society” (Hastorf, 2017: 93). “Technology is culture” (Richerson and Boyd, 2005: 29).

### *Heat Treatment*

Since the Paleolithic period, people have consumed foods such as wild almonds, wild peanuts, wild legumes and wild mustard by heat treating foods (boiling, boiling, frying, etc.) to break down and remove harmful substances such as hydrogen cyanide, which is harmful to human health (Kabukcu et al., 2023: 12, 24). For example, pea and lupins have been consumed by soaking in water, boiling, dehulling and grinding to detoxify (Metheny and Beaudry, 2015: 292). Thus, it is seen that knowledge is transferred through food preparation and cultural development is contributed to by conducting research.

Because cooking is a central task in human life, it is linked to broader aspects of social, cultural, economic, religious, environmental and political processes (Metheny and Beaudry, 2015: 32). Knowing how to cook and prepare food well allows you to prepare healthier foods. Learning how to prepare food and consuming more cooked food also means healthier physical and mental health (Thircuir, 2020; Caraher et al., 1999: 605, 606). The act of cooking indicates identity, cultural preferences, economic considerations, and political or religious decisions. The techniques used to cook, the tools used in the process, and the social spaces used for cooking reveal a great deal about the people who cooked and ate food in the past (Metheny and Beaudry, 2015: 32).

Foods can be cooked with dry heat (e.g. frying, roasting, grilling, smoking or baking), moist heat (e.g. boiling, braising, steaming or stewing), or a combination of several (Vaclavik, Christian, and Campbell, 2021: 154; Metheny and Beaudry, 2015: 32).

### *Cooking (780,000 BC)*

Cooking is simply “*the application of heat to food*” (Wrangham, 2017: 303), and is broadly defined as “*a food preparation strategy that involves the application of heat to raw, edible materials using a variety of techniques and tools, such as boiling, roasting, baking, frying, or smoking*” (Graff, 2020: 340). Cooking is an important food preparation process that transforms both edible and potentially edible elements into food through the application of heat. (Metheny and Beaudry, 2015: 31).

Cooking is considered a “subtle human action” (Civitello, 2019: 3). Cooking is thought to date back to approximately 790 thousand years ago (Henshilwood and Lombard, 2014: 125). It is claimed that the first conscious cooking of fish in a space was determined to be 780 thousand years ago by Zohar et al. (2022), in Gesher Benot Ya'akov in Israel (Klein, 2009: 262). Consuming accidentally cooked food is not considered as a culinary activity (Civitello, 2019: 4), while cumulative cultural development is achieved with surplus product, or acquiring surplus product as a result of agricultural activities with cumulative cultural development, consciously preparing different food is the formation of a kitchen and culinary culture (Civitello, 2019: 10).

The difference between a potentially edible substance and one that is considered fit for consumption is often made apparent through the act of cooking. Food preparation practices are classified into a three-way cycle of production, distribution, and consumption. Intermediate practices such as storing, processing, and cooking food are often overlooked and vaguely defined (Graff and Rodríguez-Alegría, 2012: 231).

There are food processing methods that have an important place in the existence of humanity. Such as grinding, drying, cooking and even fermenting food. It is thought that the discovery of cooked meat, accidentally tasting a meat cooked in a forest fire or volcanic lava, or the processing of raw meat with fire as a result of curiosity by humans. Fernández-Armesto (2002: 4) considers the fermentation process to be quite fascinating compared to others in terms of transforming food, but it has distinguished cooking meat with fire from the others. Rather than the way fire transforms food, it has distinguished itself from the others by transforming society. This situation, which we agree with, has also led to the emergence of culture, which has led to the formation of civilization. “*Culture begins when the raw gets cooked. The campfire becomes a place of communion when people eat around it. Cooking is not just a way of preparing food but of organizing society*” (Fernández-Armesto, 2002: 4). The kitchen is an expression of economic, religious and political processes and is defined as a social fact due to its capacity to dynamically materialize, mediate and transform social relations (Graff, 2020: 340). In addition, it is known that eating has a cultural meaning in addition to meeting physiological needs for societies, with exceptions such as extreme hunger (Barker, 2009: 447).

Especially hard foods become more applicable to processes such as opening, softening, cutting and crushing with heating. Most importantly, more energy is obtained from food by cooking (Wrangham, 2010: 13). The amount of energy obtained from meat is related to the amount of fat, carbohydrate and protein it contains, and the difference in the amount of energy of different meats occurs for this reason (McCance and Widdowson, 2014: 146-177). Cooking meat softens it, provides the transformation of some bioactive substances, facilitates digestion, breaks down toxic substances, and in addition, some vitamins are lost in cooking due to heat application and/or acidic environment. Cooked foods are broken down by the trypsin enzyme during the stomach digestion process four times better than uncooked foods. Denaturation of proteins by heat causes protein molecules to open up and lose their solubility in water, however, it has been determined that their digestibility increases significantly (Wrangham, 2010: 65). Acids found in foods such as forest fruits make proteins more digestible when kept with meat. Pemmican, a type of pastrami prepared with blackberries in ancient times, must have been prepared by observing the effect of acid on protein (Outram, 2018: 47). The amount of energy obtained from grains can be more variable (McCance and Widdowson, 2014: 30-48). For example, while raw starch is not

digestible, cooked starches can be digested much more easily, which is possible with the gelatinization of starch (Wrangham, 2010: 59).

Cooking methods; i) dry heat cooking methods: grilling, frying, pan frying, roasting, sautéing, ii) moist heat cooking methods: boiling, pressure cooking, simmering, steaming, stewing (Vaclavik, Christian, and Campbell, 2021: 154).

#### *Boiling - Simmering*

The process of boiling or simmering is the application of heat treatment for a long time in a liquid, usually water, in which food is placed, at temperatures that reach the boiling point of the liquid. It is one of the oldest methods of cooking meat, and Neanderthals and Sapiens, who are considered to be the ancestors of humans, consumed meat by boiling approximately 40-50 thousand years ago. Since the Chalcolithic Age (7,500-5,500 BC), the majority of the meat consumed on the tables of our ancestors consisted of the meat of domesticated animals (Özbek, 2020: 20). Human communities have preferred cooking methods according to the geography they live in. The Incas, one of the ancient civilizations, preferred to fry food in oil because the high altitude of the Andes mountains they lived in reduced the boiling point of water, so cooking by boiling was more difficult and required more firewood (Civitello, 2019: 110).

#### *Frying - Roasting*

Frying and roasting, which were the first cooking methods people used, are also common methods in today's kitchens. While boiling is done with water, frying is done in oil. In the past, vegetable oils were used for frying purposes in addition to animal fat and milk fat. Oils such as sesame in the Middle East (Sumania and Laban, 2021) and olive oil in the Mediterranean in 3,000 BC (Toussaint-Samat, 2008: 185) have been preferred oils since prehistoric times. Archaeological remains have determined that people boiled the marrow fat in the bones of large animals as well as muscular game meat (Von Petzinger, 2017).

In many societies, boiling is done by women and frying is done by men (Levi-Strauss, 1965: 19-29, cited in Ünsal, 2020: 20). This shows that food preparation methods also include a sociological classification.

#### *Smoking (Fume) (4,000 BC)*

One of the important food processing techniques with a very old history is drying and smoking, which can especially make meats last for a long time (Metheny and Beaudry, 2015: 164). Smoking is the evaporation of the water in the meat by the heat and smoke released as a result of burning wood, cooking the meat and giving it a different taste and aroma with the soot contained in the smoke. It is still a preferred preservation method today and has been applied to various cheeses, fish and meats probably since the discovery of fire.

#### *Grinding (10,000 BC)*

Especially in the Paleolithic period before the beginning of agriculture, the outer hulls of grains such as barley and wheat could be shed during the ripening period with a small contact or a shock from the wind. In order to evaluate the grains more easily, people roasted the grain and ensured that the hull was easily separated. In addition, it was discovered that the outer hull could be removed more easily by pounding or grinding (Nissen, 2015: 28). The grinding process, which started with the first people crushing wild seeds between two stones, is used as one of the indispensable processing methods in today's food technology.

It is known that in the past, kitchen utensils were used for food preparation activities in the kitchen and the layout of the kitchen was created accordingly. Grinding stones and kitchen utensils used to store grains were found in a certain place (Graff, 2020:344).

### *Drying (4,000 BC)*

It has been determined that excess food obtained by gathering was dried by waiting in one place. Foods such as fruits and vegetables with high water content and fresh meat were dried in sunny and windy air without being exposed to bacterial spoilage or mold, thus being stored for longer periods without spoiling. In Central Asia, horse-mounted nomads dried meat and made it edible by pressing pieces of meat under the saddle of a horse or hanging them in the wind (Fernández-Armesto, 2002: 4, 77).

### *Salting (6,000 BC)*

People need table salt, even in small amounts, for a healthy and balanced diet. In the Paleolithic period, people met their salt needs from the game and fish they ate. They must have also used salt lakes and sea salt. The first forms of salt processing were seen in the Neolithic Age (6,000 BC). Salt, which used to be called white gold, is a valuable product and was used to prevent spoilage of foods such as meat, to add flavor, and as a means of payment for services (Fumey and Etcheverria, 2007: 30).

The salting process is carried out by applying dry salt or soaking in diluted water (brine). With salting, dried meat and fish proteins are denatured and become more digestible (Wrangham, 2010: 66). By removing excess water from the food with salting, both biochemical and microbiological spoilage is slowed down considerably.

### *Seasoning (2000 BC)*

Spices are foods that are used as whole parts or powdered parts of plants (leaves, buds, bark, roots, fruits, seeds, stigmas of flowers) (García-Casal, Peña-Rosas, and Malavé, 2016: 3). Spices have always been used from ancient civilizations such as Native Americans, Middle Easterners, Chinese, Aztecs and Incas to the present day (Raghavan, 2007: 1). It is known that spices were widely used in India in 2000 BC (curry), by the Egyptians in 1500 BC (garlic, cumin, coriander, etc.) and in ancient Greece and Rome (García-Casal, Peña-Rosas, and Malavé, 2016: 3). The most commonly used herbs and aromatic plants long ago were red pepper, cardamom, sesame, cumin, thyme, dill, mint, garlic, radish, turmeric, coriander and ginger (Fumey and Etcheverria, 2007: 47). Spices are added to the food to give it color, smell and aroma. Spices were used in the past to prevent flavor changes and suppress bad odors due to the lack of cooling systems in foods such as meat, and later as food preservatives with the intense aromas they contain. In addition, spices, which are thought to have magical properties, have been used as a source of healing, religious functions and on ceremonial occasions (García-Casal, Peña-Rosas, and Malavé, 2016: 3; Raghavan, 2007: 1).

Many spices were difficult to obtain and were limited in the past, so they were sometimes very expensive to procure, but they were always found on the tables of the elite (Fumey and Etcheverria, 2007: 32). It is also known that spices such as salt and pepper were used as war compensation or as a means of payment.

When spices added to food come together with fire and heat, the taste and aroma it gives changes, and it also interacts with other nutrients in the environment, allowing a new product to emerge.

### *Preserving in Sugar and Honey*

It is known that people have consumed honey from the beehives since the period when they were hunter-gatherers, even if they had to suffer a little while taking it. In the Cave of the Spider near Valencia, Spain, in 12,000 BC, people were depicted reaching the bee nest above the rock with a vine and bringing down the honey, similarly in South Africa and Zimbabwe (Toussaint-Samat, 2008: 15). In the Paleolithic period, the only pure and ready source of sugar was honey. For this reason, foods prepared with honey have always been among the favorite foods throughout history (Toussaint-Samat, 2008: 17). The fact that it is a pleasant and fast source of energy must have increased its preference. There is no need for heat treatment in the transformation of honey into a fermented beverage - wine by diluting it with water and waiting for a day. Such beverages are recorded in many societies throughout history. Probably, later on,

sugary beverages such as diluted honey were boiled and foods were transformed into a different form. Desserts such as molasses were made.

Some fruits and plants (blackberries, grapes, millet), dates, maple syrup and honey are among the limited sugar sources in the Paleolithic period. In ancient times, it was one of the methods of preserving foods in sugary foods such as honey for preservation purposes. While jam making was previously carried out using honey, with the spread of sucrose in the modern age, jams were made from this type of sugar and are still made with this method. Fruit juices, syrups and molasses are produced by boiling fruits in hot water.

### *Caramelization*

When sugars in foods are heated at high temperatures (above 140°C), they caramelize, turning brown. Some organic acids, aldehydes and ketones are formed by the breakdown of sugar through caramelization (Vaclavik et al., 2021: 33). Baked and fried foods exposed to high heat (e.g. bread crust, fried chicken drumsticks) therefore have a pleasant color and taste (Pang and Zhang, 2021). Since prehistoric times, the appeal of foods has been high in human nutrition due to the color and taste created by the burning of sugar by fire.

### *Storage in Oil/Fat*

Animal fats are concentrated in meat and sheep's tails. Fats can be melted and revealed after heating. These fats can preserve other foods that are relatively more perishable. Thus, the taste of foods in oil, such as meat, can last for a long time without changing or being subject to microbial spoilage. Foods have also been preserved in oils such as olive oil or sesame oil.

It is stated that in a Sumerian fresco (2,500 BC), milk is put in a jar, then the cream separated from the milk is taken into a shaker and turned into butter (Toussaint-Samat, 2009: 104). By making cheese, yoghurt and butter from milk, dairy products are made to last longer and a new food is also created. The application of heat treatment in the processing of milk extends the shelf life of dairy products.

It is known that in prehistoric times, although muscular animals were relatively more easily accessible, people turned to fat sources because they were more delicious and gave more energy. Even bone marrow was boiled to provide fat. Fats found in foods are a good source of energy. A calculation given by Toussaint-Samat (2008: 80): "Game meat is lean meat, so it has fewer calories than meat obtained from farm animals. For example, 100 grams of farm duck contains 15% to 20% lipids and 325 calories, while wild duck contains 4% lipids and 125 calories. Roe deer contains only 3.6% lipids."

### *Cheeseing (6,000 BC) and Yoghurting (1,500 BC)*

In the spring and summer months when milk is obtained from animals, people had to preserve milk quickly so that it would not spoil due to the weather and the heat. With the discovery of fermentation, whether intentionally or accidentally, milk was turned into curd and then processed into various cheeses. Bread is probably the most diverse food in the world, followed by cheese. These two foods, which are products of fermentation, are made with different ingredients and methods all over the world. The processes are completed by applying heat treatment to the raw material of cheese, curd, or the dough that forms the basis of bread. The process of making yogurt is similar to making cheese, but the end product is different. In the first production of cheese, the chymosin enzyme in the stomach of a grass-free suckling lamb turned milk into curd. Cheese production began by pressing the resulting curd into a sheep or goat skin bag. In yoghurt, it is formed by the conversion of two yoghurt bacteria into milk by heating the milk (Fuquay, McSweeney, and Fox, 2011; Walstra et al., 2005).

It is stated that dairy products started to be consumed around 4,000 BC and were generally consumed by turning them into cheese, yoghurt and butter rather than raw milk. It is also thought that raw milk was used for ritual purposes (Pilcher, 2017: 24).

### *Fermentation (3,000 BC)*

Fermentation is the process in which some microorganisms (bacteria, yeast, mold, etc.) break down energy sources such as sugar in an oxygen-free environment to form alcohols, acids, lactones, volatile acids, carbonyls, terpenes, and sulfur compounds. As a result of fermentation, a characteristic taste and aroma are formed. The first fermentation is thought to be the making of sourdough bread by forgetting the dough formed by mixing flour crushed between stones with water. The fact that some foods are subjected to fermentation in a similar way means a new product. In fermentation, milk, grains, meat, vegetables, and fruits are fermented, and products with new tastes and aromas emerge.

In prehistoric times, milk consumption increased with the domestication of some animals. Some problems arose due to the lactase enzyme deficiency that breaks down the milk sugar lactose in our ancestors who first had milk in their stomachs. In this process, called lactose intolerance, it passes into the intestines without being digested, causing symptoms such as vomiting, diarrhea, abdominal pain, and cramps. People with lactose intolerance can easily consume dairy products with fermentation. While some indigestible nutrients become digestible with fermentation, the production of useful nutrients such as vitamins also occurs. The shelf life of fermented food is quite long depending on the raw material it is produced from. In the production of some fermented foods, heating with fire is often done before or after fermentation (Stanbury, Whitaker, and Hall, 2016; Montet, 2015; Hui et al., 2004; Ross, Morgan, and Hill, 2002).

### *Rotting*

The process of rotting is an ancient food processing method used to hang game meat for consumption, to leave it in the open to rot a little, to soften the tissue and make it easier to digest. A special form of hanging, wind drying, has also been used by humans for a long time (Fernández-Armesto, 2002: 4). Partial rotting softens the meat of muscular wild game. It is important, especially because the meat undergoes a very serious transformation when consumed raw. The disadvantage of this is that prolonged and improper storage of meat can result in serious illnesses and even death.

### *Modern Processing Methods*

Many important processing methods have been discovered while reaching today's technological level. In particular, determining the life cycles of microorganisms in food and the factors required to spoil food have enabled important steps to be taken to preserve food quality and prevent food from spoiling. In particular, pasteurization and sterilization processes and certain temperature and time norms applied to food significantly reduce the number of microorganisms in the food or reduce it to zero, thus extending its shelf life. In the canning process, similarly, microorganisms in hermetic (airtight) packaged food are completely killed by the application of pressure and heat. In freezing, rapid freezing and freeze-drying processes, the water that is essential for the life cycle of microorganisms is rendered unusable or removed from the environment. In this way, the food is preserved for a long time without losing its freshness and offers a long period of time that can be consumed without spoiling.

### *Storage*

Food is mostly subject to food processing to be stored for immediate or future consumption. Simple pits dug in the ground in the Paleolithic and Neolithic periods are thought to be the first storage units used for permanent storage. In these areas, where grains are generally stored successfully, it has been determined that clay soil is plastered inside to protect the grains from rodents and for more ideal storage, and that fire is used to harden them, and in a sense, the microorganism load of the environment is reduced by heating. Round or square storage containers and clay storage rooms were frequently used to store grains. These types of storage rooms could be inside the house or in the courtyard of the house (Nissen, 2015: 26). As ancient storage technologies, mostly above-ground storage facilities such as granaries, containers and warehouses and storage pits are the places identified in archaeological excavations (Metheny and Beaudry, 2015: 217).



In modern life, storage processes are provided by the application of the above basic food preparation and preservation methods, either alone or in combination. In addition, in parallel with technological development, ultra-technological processing methods such as freeze drying and microwave cooking are being applied or continue to be developed in the industry.

### *Human's Physical and Health Change*

#### *Change in Human Body Size*

While consuming food, in addition to its physiological contribution to the human body, socialization also takes place. In other words, both the physiological and sociological body emerges with food (Atalay and Hastorf, 2006: 284). When food began to be cooked on fire, physiological benefits increased, and nutrients were better digested. Heating allowed meat to be better separated from bones, to be broken down, and processes such as chewing to be shortened, and with more meat and fish consumption, a clear development of the human brain was observed (Wrangham, 2010:14). With the changes and developments of human beings from their first ancestors, there has been the ability to stand upright, to use the thumb and hand better (Curtis, 2000: 11), the growth and development of brain size, and communication with a simple language (Braidwood, 2008: 26). The increase in the consumption of cooked meat has caused the brain to develop rapidly (Wrangham, 2017: 308). It has been determined that digestion is faster and development is faster in animals such as cattle, sheep and pigs that consume cooked food/feed (Wrangham, 2010: 38). While the brain volume of *Australopithecus africanus*, which is considered the first form of humans (Braidwood, 2008: 28), was 380-530 cm<sup>3</sup> (Curtis, 2000: 8), it was determined that it was 935-1200 cm<sup>3</sup> in *Erectus* (*Homo erectus*) and 1450 cm<sup>3</sup> in Neanderthals (Braidwood, 2008: 33). The brain of *Homo sapiens*, the modern human, is larger (1350 cm<sup>3</sup>) (Shea, 2017: 93; Braidwood, 2008: 33). Regular consumption of meat and fish has led to a healthier human being, a taller body and a larger brain. With the act of eating cooked and chopped food, the human body has evolved into smaller organs (teeth, mouth, stomach, intestines etc.). Smaller teeth have provided more efficient small-piece separation and nutrition. According to calculations, it has been determined that small teeth are 56-82% better for breaking raw potatoes (Wrangham, 2010: 40-43). “*Changes in the size of teeth and jaw structure, the placement of the thumb on the hand and the acquisition of precision grasping ability, the development of shoulders, ribs and waist to aid movement and maneuverability, a more sophisticated brain structure leading to increased cognitive skills and perhaps a primitive form of speech*” are expressed as changing conditions at the point of human evolution (Curtis, 2000: 19). It is thought that human interaction with other people while searching for food had a major impact on the emergence of language (Ünsal, 2020: 21).

#### *Change in Digestion*

Since humans started consuming meat regularly 2-2.5 million years ago, their digestive system has changed and adapted to new foods (Özbek, 2020: 95; Stanford and Bunn, 2001; Mann, 2000: 71). While the human small intestine began to shorten, the development of the brain continued. In the Upper Paleolithic period, some human groups hunted certain animals and consumed their meat. People consumed the meat of reindeer (*Rangifer tarandus*) in Europe, horses (*Equus ferus*) in Central Asia, gazelles (*Gazella* spp.) in Western Asia, bison (*Bison bison*) in North America, and guanacos (*Lama guanicoe*) in South America. During the Neolithic period, they consumed the meat of animals such as cattle (*Bos taurus*), sheep (*Ovis aries*), goats (*Capra hircus*), and pigs (*Sus domesticus*) in many parts of the world (Metheny and Beaudry, 2015: 309).

In human nutrition, consuming too much protein to provide energy without carbohydrates or fat causes serious health problems and excessive protein causes a type of poisoning. Symptoms of protein poisoning include high ammonia in the blood, liver and kidney problems, dehydration, and loss of appetite. If only protein-based nutrition is not provided within 7-10 days, it eventually causes diarrhea and death (Wrangham, 2010: 47). Hunter-gatherer people consumed food according to the ecosystem they lived in. Wild seeds, fruits, roots and tubers of some vegetables were more limited in their diet as a source of carbohydrates. In addition to these, they also consumed fatty and energy-rich foods such as avocados, olives and walnuts (Outram, 2018: 44; Wrangham, 2010: 49). With the meat of wild animals, protein and limited

animal fat could be reached. Nuts were relatively balanced food sources in terms of fat, protein and carbohydrates. Especially the meat of game animals is rich in protein and relatively poor in fat, it has been determined by research that protein consumption is not desired and causes carbohydrate craving. It is known that people are more interested in how fat the animal is rather than consuming protein as a nutrient. It has been determined that, whenever possible, the fat content under the skin of an animal was tried to be determined before hunting it (Outram, 2018: 44). In much earlier times, broken bones obtained from archaeological remains actually show the interest of people in animal fat. Especially after the discovery of fire, game animals were made palatable with fat extracted from bone marrow. They even preferred to extract marrow fat from large leg bones because the fat from rib bones was less delicious (Outram, 2018: 44-46). Sea fish obtained from coastal areas were also preferred as a source of fat. It has been determined that more intensive protein-fat consumption made hunter-gatherers more fond of sweets, which were limited, and they used fruits, forest fruits (blackberries), maple syrup, dates, grapes, extracts of some plants and honey as sources of sweets.

When food is cooked, proteins are denatured, muscles and connective tissues soften, starch gelatinizes, complex carbohydrates become more digestible, decompose into simple sugars, fats melt, aroma is released, sugars partially caramelize, some indigestible fibers, vitamins and minerals can be digested more easily, some harmful compounds are broken down, bitter compounds are broken down, the number of harmful microorganisms such as bacteria and parasites decreases or disappears, enzymes are inactivated, food turns into a less perishable form, shelf life is extended, it becomes more delicious, desirable and nutritious with a soft texture and pleasant taste, and it becomes more energy-giving. In addition, chewing and digestion processes are shortened, making consumption easier. In case of excessive heating, hardening of the tissue, even burning, and carcinogenic compounds may occur, in which case an undesirable bitter taste and bad smell occur, and the food becomes inedible (Pollan, 2014: 51).

Cooking has been called the “first scientific revolution” (Fernández-Armesto, 2002: 10), because there is a biochemical change in the nutrients in food. Starch is insoluble in cold water, it remains partially suspended in water as a suspension. With cooking, starch properties change and it absorbs water through a process called gelatinization. Gelatinization varies according to the starch source, starting at 60-71°C and continuing at higher temperatures (Vaclavik, Christian, and Campbell, 2008: 41). High temperature applications break down starch granules, and inulin, a type of carbohydrate, breaks down. The cell walls in the food are weakened and enzymes are denatured, the fat in the tissue is dispersed, the amino acid chains of the proteins are opened and broken down (Metheny and Beaudry, 2015: 165). Experiments conducted with some starches (from oats, wheat, bananas, green bananas, potatoes) have determined that digestibility in the small intestine increases by 28-109% with cooking (Wrangham, 2017: 304). Similarly, cooking legumes gelatinizes starch, improving palatability, coagulating protein and increasing digestibility after cooking (Vaclavik, Christian, and Campbell, 2008: 161). Lipids in wild plant and animal foods, primarily together with unsaturated fatty acids, are hydrolyzed and broken down at temperatures above 95°C (Metheny and Beaudry, 2015: 166).

It has been stated that people who consume raw food experience “chronic energy deficiency” due to low body mass index (BMI). It has been determined that women who consume cooked food have a high BMI and have better ovarian function (higher probability of having a baby) than others. In this respect, it has been emphasized that consuming cooked food is more important than consuming meat (Wrangham, 2017: 304). A person’s physical and mental health is also positively affected by consuming enough red meat (Wyness, 2016: 227; Pereira and Vicente, 2013).

#### *Change in Health and Microorganisms*

Since the Neolithic period, bread making humans must have added the milk of domesticated animals to the bread composition. If the bread dough was made with sourdough, that is, if it had the chance to ferment with lactic acid bacteria (LAB) naturally found in the environment, from milk, flour or air, some LAB species that are important for health must have settled in the intestines. LAB ferments carbohydrates in the environment and produces organic acids and antimicrobial substances (such as bacteriocins) to prevent the development of harmful microorganisms. LAB, found in sourdough or milk,

is known to strengthen the immune system with its activity in the intestines, increase resistance to pathogenic microorganisms and provide anti-cancer effects (Corsetti and Settanni, 2007; Axelsson, 2004; Carr, Chill, and Maida, 2002; De Vuyst and Degeest, 1999; Gilliland, 1990).

One of the important problems that humankind has not been able to adapt to physically throughout its existence, especially due to the effects of climate change, is bacterial infections and toxins caused by molds. In particular, they are exposed to many harmful bacteria such as *Staphylococcus*, *Clostridium*, *Campylobacter*, *Listeria*, *Vibrio*, *Bacillus* and *Escherichia coli* from foods that are not hygienically clean, such as raw meat and milk (Clark and Linares-Matás, 2024; Frey-Klett, et al., 2011; Newel et al., 2010). In addition, for example, cooking areas in Çatalhöyük had negative effects on human health due to the smoke from the fire burning inside. Being in closed areas for long periods of time, such as in winter, and being constantly exposed to fire smoke may have caused anthracosis by the accumulation of soot in people's lungs as a result of inhaling smoke (Larsen and Wilson, 2006: 138; Hodder, 2006b: 174). It has been determined that white lime plastering is done once or twice a year (Farid, 2006: 168). It should be learned that lime plastering not only transforms the living room into a cleaner appearance and a more spacious area, but also provides hygienic cleaning.

After humans domesticated sheep, goats, cattle and pigs, microorganisms that were not sufficiently cooked over fire or raw meat and milk and their products caused humans to be infected with *Brucella* and *Clostridium* bacteria and their spores, and parasites that are harmful to health (helminths, tapeworms, etc.). It should also be taken into account that the same risks constantly threaten humans from animal and human feces left out in the open. Excessive human contact and diversity have led to the spread of diseases such as tuberculosis, cholera and malaria. In addition, brucellosis has increased with the consumption of raw animal meat. Pathogenic microorganisms found in raw milk have seriously affected human health. The addition of raw materials to foods such as porridge, which come from cross-contamination with raw meat and are prepared from milk in particular, has caused infant deaths. In the conditions provided by sufficient heating of milk and sufficient cooking of meat, it has not adversely affected the health of humans and babies (García, 2020; Roller, 2012; Marriott, Gravani, and Schilling, 2006; Marriott and Robertson, 1997).

As food culture began to change, diseases such as iron deficiency, anemia, tooth decay, and intestinal infections began to be seen more commonly. The iron found in meat can be digested better than that obtained from plants. Meat has a strengthening effect on the immune and nervous systems (Özbek, 2020: 28, 77).

Cooking meat in dry heat will cause the meat of older animals to have a harder structure, while the meat of younger animals will be softer because it contains fewer cross-links. In addition, with water cooking, the connective tissue that makes up the muscles of the meat, namely collagen, will denature and settle more easily (Vaclavik, Christian, and Campbell, 2021: 154). Archaeological findings have determined that people chose a certain type of animal, a certain gender and age, when hunting animals. Here, younger animals, fatter animals, and animals with softer meat were given priority.

In the Paleolithic period, cooked lean game meat was considered a healthy food despite containing fewer calories, but today, the excess energy, fat and saturated fat contained in fatty meats are the main factors of cardiovascular diseases (Siri-Tarino et al., 2010; Mann, 2000: 71).

#### *Simple and Natural Nutrition: Paleo Diet*

Prehistoric people naturally ate with the animals they hunted and the plant foods they gathered in their habitat. They created a diet with wild nuts, grains, legumes, fruits, vegetables, seeds, leaves, stems, roots, and tubers they collected from nature. The wild animals they hunted, fish, and other aquatic products, as well as fruits and vegetables, provided a diet rich in protein, low in fat, and containing high fiber and essential fatty acids. It has been determined that hunter-gatherers have a proportionately low incidence of Type 2 diabetes and cardiovascular diseases, and for this reason, it is suggested that the diet that is suitable for human nature should be a paleo-diet (Yan and Louie, 2024; Tekeli, 2021: 191).

### *Modern Cuisine and Nutrition*

From the single type of paleo-diet to the present day, humans have prepared thousands of different foods with four tastes (sweet, salty, bitter and sour) under the influence of nutritional culture, using ecological differences in a unique way, and have created dozens of sub-culinary cultures (Fumey and Etcheverria, 2007: 28). It is obvious how complex nutrition has developed with cultural evolution and will continue to change with scientific and technological advances. Indeed, after the Industrialization Revolution, many health problems have emerged with the increase in products prepared with pesticides, hormones and antibiotics used in agriculture and animal husbandry, packaged in kitchens, added food additives and refined products. The negative effects of additives and the consumption of substances such as trans fats, refined sugar etc. contained in increased processed products primarily bring about many types of cancer (breast, uterus, colon, prostate etc.), obesity, coronary heart diseases, diabetes etc. It has been determined that a significant portion of cancer is caused by the diet (especially the Western diet) and cooking style. It is stated that the main cause of cancer is the incompatibility of the human genome and culture. The change in food culture started with the Neolithic age and especially after the 1950s, it evolved into fast food style with industrialization and packaged, overly processed foods produced with food additives, the human digestive system could not keep up with new and synthetic compounds, and the decrease in daily movement brought many diseases. It is stated that today's modern diet and lifestyle are not suitable for the human genome. Inactivity, consumption of processed foods containing excessive carbohydrates and fats trigger obesity, and it is seen to be responsible for the formation of at least 15 different cancers (Tekeli, 2021: 189-192; Avgerinos et al., 2019; Wolin, Carson, and Colditz, 2010; Calle and Thun, 2004; Manson et al., 1990; Donahue et al., 1987).

Humans still use wheat, rice and corn as a significant amount of energy source. Almost half of the daily energy source of people in the world is provided by these foods. The remaining nutrients are obtained by processing the foods obtained from agricultural products and the meat of animals domesticated by humans. Although there are uniform nutritional products in the modern age due to globalization, it is known that people in the world prefer different tastes. This differentiation actually prevents the complete globalization of nutrition. North America prefers sour and sugary (ketchup), South America prefers salty and bitter (tequila), Spain-Portugal region prefers sour and salty (vegetables, delicatessen, cheese, spices), Europe and Turkey prefer salty and sugary (pastilla, couscous), Africa prefers salty and sugary (pastilla, couscous), Far East prefers sour and bitter (soy sauce) and Australia prefers sour and sugary (ketchup) tastes (Fumey and Etcheverria, 2007: 29). It seems that people can be healthier by giving up such tendencies and turning to less processed/unprocessed, synthetic food additive-free, traditional foods and moving away from the modern lifestyle.

### **Conclusion**

After the evolutionary transformation of mankind, especially as we approach the Neolithic period, it is seen that some important cultural changes and transformations have begun in the world. It is seen that mankind's existence in Africa and its spread to other parts of the world took place especially in the last 60,000 years and that it started to multiply and form civilization in important cultural centers (especially Mesopotamia and China). With the consumption of cooked meat, which is said to be one of the most important factors in the physiological change of mankind, there has been a positive change in the size of the brain and other organs, and an increase in manual and mental skills. Mental change, together with the necessity of organization to find food, brought about communication among people, and as a result, the development of language and speech, and social unity. People who acted together began to provide partial food security by gathering and hunting more food. People, whose time to search for food decreased, had the opportunity to think and observe nature.

After the combination of social unity and the sense of security, settling in a place, planting and harvesting grains in a place, and domesticating animals emerged. The settled people began to produce tools and equipment by observing the needs of hunting animals and making agriculture easier. In fact, simpler tools such as cutting and piercing stone tools began to be used much earlier. The people who observed and

thought about nature more (artists) tried to make the next generations feel their existence by drawing the things around them in caves and rocks. The people who saw the magnificent natural events felt the need to take refuge and worship a being in terms of religious and ritual long before.

After the fire was taken under control (for its conscious use), its use in food preparation and equipment production accelerated the bio-cultural and socio-cultural transformation of humans. Humans who started to live together for food gathering and hunting increased communication and information sharing with social unity. As a result of all the (cultural) activities of thinking humans, civilization emerged with cumulative cultural development.

Agricultural activities and the processing of food obtained from domesticated animals accelerated in parallel with the production of tools. In addition to cooking meat directly over fire (frying), the fire pits, clay balls, etc., and all kinds of kitchen utensils that emerged influenced the method of preparing food, and a transformation towards boiling, simmering, and other methods took place. The methods of food processing and preservation that were developed and widely used from the Paleolithic to the Neolithic period include cooking, grinding, drying, salting, seasoning, cheeseing-yoghurting, storage in oil/fat/sugar, and fermentation. All of these methods involve more or less interaction with fire (and heat). As Levi-Strauss stated, it can be said that humans control and direct nature with fire. The act of eating, one of man's favorite activities, is also largely shaped by fire. Different dishes can be produced with different uses of fire. Cooking methods are basically of two types: dry and wet heating. Accordingly, the dry heating method used from the earliest times to the present day is frying, roasting and smoking, while boiling, simmering and steaming can be listed as wet heating methods.

The change in human eating habits is also seen to affect physical health. It is argued that the Paleolithic diet, in which people moved a lot during the day (called the Paleo diet), was more suitable for human genomes with fewer calories, no fat, and raw fruits and vegetables, and caused fewer food-related diseases. The situation that seems to support this argument is as follows: The consumption of overly processed foods, containing food additives, agricultural drugs, antibiotics, hormones, and foods containing high levels of carbohydrates and trans saturated fats is considered to be the cause of many diseases. It is thought that modern nutrition triggers obesity and, together with a sedentary lifestyle, leads to death, primarily due to cardiovascular diseases and cancer.

Although it is no longer possible to live a one-on-one life as in the Paleolithic era, it is thought that a life should be lived in which food is prepared in accordance with the genes of the human being from the time it is grown in the field and on the farm until it reaches the table, and the nutritional requirements recommended by modern medicine are met. In this context, traditional and cultural knowledge from past generations should be protected and appropriate food preparation methods should be used. Most of the basic food processing technologies used today and widely used agricultural products have been widely used from the Paleolithic age to the modern age with the cultural development and change of humanity, and have ensured the continuation of humanity. If a conscious intervention is not made to this situation, there will be a world full of people with serious health problems in a very short time.

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