Proper infant nutrition means providing the baby with proteins, fats, carbohydrates, vitamins, minerals and other essential substances that support normal growth, survival, functioning and development to the fullest of the infant’s potential, as well as resistance to infections and diseases promoting normal functioning [1].

Mother’s milk is the optimal source of nutrition in the first months of the baby’s life. Breastfeeding is a natural continuation of intrauterine life and represents the biological unity between the mother and her child [2]. From the beginning of mankind, caring for the offspring was done by constant mother-child contact, and breastfeeding was there to provide the newborn with food, warmth, protection and a place in the society (Figure 1).

Breastfeeding is the foundation for survival and health of a child and it provides essential and irreplaceable nourishment for child’s adequate growth and development. It is the first immunization that protects the child against respiratory, gastro-intestinal, and other potentially life-threatening diseases. Also, breastfeeding offers protection against obesity and certain non-contagious diseases later in life [3].

As mammals, human beings have always depended on mother’s milk for survival. Throughout the history, the practice of breastfeeding was shaped by cultural values, some of which are viewed today as damaging both for breastfeeding itself and the child’s health. In order to demonstrate the importance of breastfeeding for health professionals and their role in its promotion, it is important to understand why some societies had supported, and still support certain beliefs and practices around infant feeding, while others offered no such support.

Breastfeeding, as the most natural way to feed infants, offers an insight into the development, progress and perfecting the process of feeding infants in the first year of life and brings us to a conclusion that breastfeeding must be supported in various ways within a society and regulated by law [4].

If we were asked today what food is given to the baby that is not breastfed, the most likely answer would be the non-human milk. However, if we were to go back to the prehistoric period we would discover that such answer was not acceptable. Prehistory is a period in human civilization in which humans hunted and gathered food to survive [5, 6]. If, at that time, a mother could not breastfeed, her newborn baby would be condemned to parish unless some other woman took her place. Likewise, mothers that had sufficient milk would continue breastfeeding their children up to the time when they were capable of finding their own food.

In the Neolithic Age, when humans tried to find solution to everyday problems with planting, harvesting and raising cattle, they still did not come up with an idea to use milk from animals in their own diet or feed it to their children [4–6]. When domestic animal herds were established, children began surviving thanks to animal milk [7–9]. The story of Moses, as told in the Old Testament, tells how the Jews and Egyptians sought healthy wetnurses in order to secure survival of children who were separated from their mothers. Another story gives approximate description of how long children were breastfed. For example: a thousand years before Christ (BC), when he was three years old. Samuel was taken to live with Eli, after he had been weaned (1 Samuel 1: 22–24) [10].

Teachings in the Talmud, some 200 BC, supported and encouraged mothers to breastfeed their children for 2 years, stressing that by doing so the mothers “preserved life” of their children [8].

The people of Mesopotamia, Egypt and Hebron looked after their offspring in a similar manner that has remained unchanged and supported by their
cultures for millennia. These people considered children to be divine gifts, so they treated them accordingly.

After Egypt had fallen under the Roman rule, the Greco-Roman culture became dominant and children lost their value. Families would make contracts with wetnurses, who would take their children to their own homes and returned them to their parents years later. This custom had spread throughout the Greek colonies and the Roman Empire and was eventually accepted in Europe. If there were no wetnurses available, children were fed from feeders or directly from an animal’s udder. During the nursing period, some children were given animal milk and eggs and after weaning fruits and vegetables would be introduced [6–8]. Customs and traditions associated with child care have their roots in the Greco-Roman and Arab medical traditions.

According to Hippocrates, children should be fed solid foods as soon as they cut their first teeth [11]. In his work “Historia Animalium” Aristotle expressed his opinions, among other things, on human and non-human milk and discussed their quality and composition. He noted that milk contained whey and coagulum, that milk with a higher percentage of coagulum was more nutritious, but that milk with less coagulum was healthier for babies [12]. He also advised mothers, in case of a new pregnancy, not to breastfeed their children before they turned seven months old, because the colostrum in the milk becomes adequate only after childbirth. Little is known what food was given to children in that period. However, Fields presumes that infants were fed with milk combined with honey, cereals, chewed food or by directly suckling from animals [13].

In the first century of the Anno Domini the first Roman texts, by Soranus and Galen, discussed childcare [14]. Philosophers and moralists of that age were against wetnurses. Pliny, Plutarch, and Tacitus considered milk to be the best food for infants and that breastfeeding helped mother and child establish and strengthen emotional bonds “avoiding future problems” [6]. According to these authors, a mother should be relieved from her breastfeeding duty only in case of illness or new pregnancy [8]. Plutarch established the first moral movement supporting breastfeeding [15]. Physicians of that time were less demanding than their fellow philosophers when it came to breastfeeding. They believed that by suckling the child absorbed characteristics of the wetnurse. Therefore, attention was paid not only to their qualities as milk providers and the quality of milk, but also to personal traits of the wetnurse, her age, health, temperament, and morals [6, 8].

The knowledge of Ancient Greece arrived into the Arab world in the 9th century BC. To be more precise, Islamic authors of the medical texts were predominantly Persians. Notable among them was Avicenna, the author of the “Canon of Medicine”, a five volume encyclopedia that represented a skillfully organized medical knowledge of that period [6, 8, 14, 16]. Avicenna believed that health and other characteristics of the nursing mother affected the health of the baby. He advised that children should be breastfed as long as possible, because he believed the mother’s milk was the optimal food for infant growth and development [8, 16].

Medical writings of the Middle Ages are based on the knowledge of Galen, and later Avicenna that have been translated into the Latin and used at the European universities up to the 17th century [14, 16]. Discovery of the printing machine stimulated book publishing during the Renaissance (13th – 17th century). Among medical texts of the time, especially significant are four treatises on pediatrics known as “Pediatric Incunabula” [6, 17]. Authors of the new books followed the recommendations of Avicenna, they supported breastfeeding, but failed to recognize the significance of colostrum. The fact that books were printed in other languages, apart from Latin, was a great advancement that made information more accessible. In one of these books, from 1429, there is a drawing of a baby being fed from a receptacle similar to today’s feeding bottles [8, 18].

During the Renaissance and Reformation, traditions gradually changed, with the appearance of the first handbooks for midwives. After the publication of “The Accomplished Midwife” in 1668, the whole concept of baby nutrition began changing [6]. The author of this book, Mauriceau expressed his opinion on nutrition of children whose mothers had no milk. Paps and other substitute foods were presented as an advantage over milk, while the advantage of breastfeeding gave way to the relationship between the mother and child [4].

In 1748, almost one hundred years later, in the book titled “An Essay upon Nursing, and the Management of Children, from Their Birth to Three Years of Age” by Cadogan, colostrum was recognized as a substance responsible for the elimination of meconium, and prevention of illnesses of mothers (milk fever) and children (gastro-intestinal infections). Also, he believed in the importance of the emotional bond that was established if the mother breastfed her child from the hour it was born. He opposed wetnurses and introducing non-milk food before the baby turned six months. He also believed that by boiling non-human milk the milk lost its properties and therefore might be harmful to the baby [6, 8].

In the period between 1675 and 1750, there was a gradual decline in infant mortality rate in England and Sweden. This phenomenon was attributed to the doctors and midwives that supported breastfeeding [4, 18]. This was the period when mortality rates among newborns were cut by half due to the change of habits related to infant nutrition. Infirmaries were set up (1747), where mothers spent several days after childbirth in order to establish lactation and
where the babies were placed on their mothers’ breast within the first hour after being born [5].

During the 16th and 17th centuries, mothers without milk often fed their children with paps and soups than by using services of wetnurses. Recipes for such paps included liquid ingredients (milk, beer, wine, vegetable and meat broth, and water), cereals (rice, wheat and corn flower, and bread) and supplements (sugar, honey, eggs, meat, and spices) [6, 8]. This type of nutrition was acceptable, only lacking vitamin C due to insufficient intake of fruits and vegetables [8].

During the 17th century, a nutritive status of children worsened because non-human milk and meat broth was gradually replaced by water. Eggs, butter, and animal fat, as sources of vitamin A and D, proteins, calcium, and iron, were no longer used. As a result of such diet, children started suffering from rickets, scurvy, and kidney stones. Contamination of utensils and food increased the incidence of tuberculosis, brucellosis and other gastro-intestinal infections [6, 8]. Non-dairy food that was introduced during 7–9 months of age was in the 16th century being introduced to babies between 2 and 4 months old.

The Industrial Revolution in England started in the 18th century. This was the time when migration from villages to towns took place and that irrevocably changed the habits of feeding infants that had been common practice for centuries. Urbanization changed the family life. People were poorer, they lived in inadequate facilities, in populous families, and in unhygienic conditions. People were exploited for minimum wages and, as a result, women were forced to go to work daily. Children were left behind at homes or in institutions. Wetnurses were nowhere to be found, as was the money to pay them. At that time techniques that would preserve the milk during the transport from the villages to the towns, or for storing milk at home were still unknown. This affected milk quality and safety [4].

At the end of the 19th century, scientist believed that high rate of malnourishment and mortality among infants was associated with the decreased percentage of children being breastfed and increased percentage of children being fed by non-human milk. In 1863, in Manchester, Jelliffe stated that 60% of breastfed children were well-nourished at 9 months [19]. According to Radbill, feeding with paps or non-human milk caused 100% of mortality during the first week of life [20]. Simon’s discovery in 1838 that cow’s milk contained more protein and less carbohydrate than human milk propelled the argument that non-human milk should be introduced in human diet [21, 22].

What was the situation like in our region? There is a breastfeeding culture in the region. Between the 12th and the 15th century, the Serbian medieval medicine was thriving. In the 14th century, an Icon of the Mother of God the “Milk-Giver” was discovered in the Sopočani Monastery where the Mother of God is depicted breastfeeding a baby. This image speaks of breastfeeding as a cultural heritage from that time. The “Milk-Giver” is one of the most beautiful pieces of Byzantine art and has a great artistic and spiritual value. Many Orthodox Christians offer their prayers to the icon, believing it would bring salvation to them. Young women pray to the icon in order to receive a blessing for health and happiness, and some women believe that the icon helps them during childbirth, or if they lack milk for breastfeeding, or when bringing up children, as well as for salvation of their souls [23].

With the fall of the medieval Serbian state, the folk medicine became even more non-scientific leading to degradation of science, culture and medical knowledge. People started turning to witchcraft again. One of the examples of superstitious beliefs was the practice of mothers taking their newborns to the river on the third day of their postnatal life in order to cleanse the evil, believing that witches took mothers’ milk. It was also believed that such practice would make the milk flow like water (“Beliefs of the South Slavs about Childbirth and Infant Health” by Dr. Milorad Dragić) [24]. Also, breastfeeding was often part of numerous epics and stories. An example of one of the most beautiful and exalting epics is “The Building of Skadar” in which a young walled-up bride, wife of Gojko Mrnjavčević, begs her brothers in law:

…“A window for my bosom leave. Draw out for me my two white breasts. So when my tiny Jovo comes. He still can suckle from my breasts”… [25].

In the 18th century, the Renaissance in culture and medicine brought Enlightenment and the sorcerers and the healers gradually disappeared, whereas the first medical professionals started appearing. They were educated individuals from Vojvodina who spread their influence among the Serbs who were under the Ottoman rule for centuries. In the 19th century, a book titled “Čadoljub”, about child care in the first year of infant life, was published in Budapest by a physician Gavrio Pekarović, as a part of the general cultural advancement. The book was intended for Serbian mothers and included recommendations and advice related to nutrition and child care [26]. In 1881, in Sombor, Dr. Milan Jovanović Batut initiated a journal “Health” that featured an article about breastfeeding in one of the first issues [27]. Many years later (1936) the importance of natural diet and benefits of mother’s milk were topics of many discussions. Well known professors of medicine (Ambrožić, Čupić, Kostić, Ružičić...) pointed out that “natural diet should be the first chapter of pediatrics and that the entire healthcare should be based upon it” [28].

As time passed by, cow’s milk has proved indigestible, because it contained more whey and it was blamed for deaths due to “intoxication” by milk protein or due to excessive electrolytes [29]. This led physicians to prescribe diluted cow’s milk before giving it to the infants. This practice generated the following problem: it was discovered that with such diet mortality rates dropped, but it was soon discovered that children were not gaining weight. In order to overcome these shortcomings, it was
recommended to add sugar or cream to the diluted milk. Thereafter, the cow’s milk became the dominant milk in the nineteenth century because there were so many arguments in its favour [21]. Between 1850 and 1910, scientific advances in the field of bacteriology led to the process of pasteurization to be considered. This idea was suggested by Appert (1795), and by Pasteur (1864). They exposed wine to high temperatures thereby eliminating the bacteria that turned it to vinegar [9, 22]. This process was used to stop milk from going sour. Many physicians, however, opposed to the method because they believed it reduced the nutritional value of milk, making it low in vitamins C and D. Pasteurization only became a routine practice in the United States after 1915. Another huge idea of the nineteenth century in this area was supported by Gail Borden who discovered a method for making condensed milk. The milk was heated to high temperatures to remove half of the water content, and large quantities of sugar were added. The condensed milk was sterile and could be stored because it was bacteriologically safe. It was used to feed soldiers in the American Civil War in the period between 1861 and 1865 [22]. As with any new ideas, there were sceptical physicians who observed that infants were not thriving because of the low fat content in the milk [21]. The first commercial infant formula was developed by Liebig. He managed to produce a combination of ingredients that resulted in a powder. This milk was presented to the mothers as “humanized milk” in order to confuse the terms “human” milk and “humanized” milk. This formula was easy to make, because it only required the powder to be mixed with water [30]. However, this product was not affordable to the general population in Europe and America because of its high cost.

Unfortunately, all the above mentioned factors, together with the promotion of the formula, resulted in the decrease of breastfeeding [6, 21]. In 1940, in the United States, the industrially produced milk formula was fortified with vitamin D and children were given juice in order to overcome small concentration of vitamin C in the milk. These were the reasons why physicians believed that using formula was safe [31].

In search for higher profits and due to falling birth rates caused by the Second World War, manufacturers began “perverse” promotion of breast milk substitutes [21]. The formulae that predominated between 1950 and 1960, were similar to evaporated milk, but with added vitamins, enriched with vegetable oil and minerals, and with low protein concentration [4].

After 1960, the birth rates started falling again. This time the reason was the contraceptive pill and the feminist movement. Breasts, which had had only functional connotations, gained esthetic and sexual roles. Feeding bottles were adopted as a symbol of women’s liberation. Due to new advances, composition of formula was changed (lactose, fat, minerals, vitamins, and lactic acid) and they became more present in infant diet. Markets were also expanded. All of these changes contributed to the decline in breastfeeding rates and early introduction of supplementary foods in infant diet [19, 32, 33]. Although the real reason is unknown, the things started changing for the better in the 1970s. The reasons appear to be rooted in the change of mentality, which accused the industry of interfering in breastfeeding using aggressive advertising campaigns. Breastfeeding became popular again! Cow’s milk was being introduced later into the infants’ diet, because mothers opted to breastfeed their infants [31]. The reasons for this were probably the studies that linked cow’s milk to anemia [2]. Formula fortified with iron was being recommended. In 1979, Fomon et al., found that there was a risk of overweight associated with introducing formula into infant diet. Obesity is caused by inability of children to refuse food after being full.

With the support of breastfeeding, nutritional recommendations for children were changing. For example, in 1976, 60% of children in the United States were already eating solid foods at 1 month, while in the early 1990s this rate was below 10% [31]. We need to stress that the prevalence of breastfeeding reached its lowest point in 1972, when it was 22%. In the following years the rates inclined,
reaching 34% in 1975, while in 1984 the prevalence was as high as 59.7% [34]. Among the factors most responsible for this increase in breastfeeding are most certainly the Natural Childbirth Movement (1960) and Baby Friendly Hospital Initiative launched by the World Health Organization (WHO) and United Nations International Children’s Emergency Fund (UNICEF). Their goals were defined by Ten Steps to Successful Breastfeeding (1990) in order to promote, protect and support breastfeeding [35]. It was the initiative of these organizations to prohibit advertising baby milk, bottles, and pacifiers. Under such pressure, the industry adopted the following advertising slogan “breast milk is the best food for infants”, emphasizing that these products should only be used if mothers did not have sufficient milk and if they could not breastfeed [21, 32].

In 1993, the WHO observed that breastfed children had a different pattern of growth and it defined the growth curves for breastfed children. Between 1997 and 2003, data were collected from children of six different ethnic groups to create international reference curves. The study showed that children from different ethnic groups had similar growth curves if given satisfactory conditions [36].

Science advances rapidly, and health professionals are obliged to follow such advances and make new ones. At present, WHO and the Pan American Health Organization currently recommend feeding infants only by breast milk until 6 months. Solid foods, non-dairy foods should be introduced from 6 months onwards (cereals, fruits, vegetables, meat). Salt and sugar, processed meat, juices, and canned food should be avoided [2, 37, 38]. Food consistency should be thickened gradually, while home cooked food should be preferred to processed foods as the latter contain additives, preservatives, and antibiotics [2, 39]. It is recommended that breastfeeding should be encouraged until 2 years of age [4]. In 2017, the WHO adopted the resolution WHA65/6, a Comprehensive Implementation Plan on Maternal Infant and Young Child Nutrition that lists six global targets concerning child nutrition by 2025. The target number 5 is to increase the rate of exclusive breastfeeding until 6 months postpartum to at least 50%. The exclusive breastfeeding is defined as exclusively breastfeeding a child until 6 months of age (without other foods and water), starting from the first hour of life and to be continued until the second year of life [40–42].

Globally, only 38% of children are exclusively breastfed until 6 months of age [43, 44]. There is a possibility to increase the rate of exclusive breastfeeding. Between 1985 and 1995, the rate of exclusive breastfeeding increased from 14% to 38%, but unfortunately decreased subsequently. However, 25 countries increased the rate of exclusive breastfeeding by 20%. The increase of exclusive breastfeeding rate may be of assistance in attaining the global nutrition targets and be a strong influence for the improved population health and state economy. It is necessary to examine the knowledge on the benefits of breastfeeding and based on it adopt measures and set priorities that would increase the rate of exclusive breastfeeding by at least 50% until 6 months postpartum [43].

In the end, for the sake of cultural and traditional heritage of our people, it is worth mentioning that the icon from the Sopoćani Monastery has become a symbol of the movement dedicated to breastfeeding, and that on March 14, 1992 the icon was used as a theme for a postage stamp and a poster “Breastfeeding is the Best” in the UNICEF and WHO breastfeeding campaign (Figure 2).

Figure 2. Icon of the Mother of God the “Milk-Giver”
Slika 2. Ikona Bogorodice Mlekopitateljnice

References