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Traditional European Breads

An Illustrative Compendium of Ancestral
Knowledge and Cultural Heritage

 Springer

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Preface

Bread is one of the most widely consumed staple foods in the world and one of the oldest forms of processed foods, with evidences of bread-like food remains and fermentation utensils developed by our ancestors dating back to the Neolithic era in multiple locations around the world, including Europe and Asia, and the oldest evidences of bread production discovered dating back 4000 years before this Neolithic period. The process of bread-making has been gradually and constantly improved, aiming to adapt to the new demands and changes in preference of the population and to improve the efficiency of the processes and expand the distribution of the products. Not only that, but wide varieties of breads have also been developed over the centuries in multiple countries to incorporate in their recipes special seeds, cereals and other ingredients that were locally produced in these regions, as well as seasonal ingredients produced in these agricultural regions. This led to the development of a wide variety of products (i.e. variable shapes, colours and sensorial profiles), all of them commonly referred to as “bread”, that could be consumed with different types of meals on a day-to-day basis, as well as speciality breads associated to particular seasons or even products tightly linked to different festivities, celebrations and religious rituals all over the world. All these traditions and know-how of both bread-making process and bread were developed over centuries in different countries, and even specific geographical areas within the same country, reflecting cultural differences and commonalities between human populations that can also be linked to other food consumption preferences.

This book was originally born from the ambition and interest of the members of the network SOURDOMICS (COST Action 18101 – *Sourdough biotechnology network towards novel, healthier and sustainable food and bioprocesses*) and the project expanded beyond this network to multiple researchers that developed valuable contributions when compiling the current knowledge on the rituals, traditions and recipes of ancestral processes of bread-making in multiple countries in Europe. This book includes multiple figures, pictures and illustrations that are not easy to access or not compiled currently in any other manual in relation to the history and tradition of both bread and/or bread-making processes. This includes pictures and illustrations related to bread-making process, including primitive ovens, tools and products

that are currently exhibited in various museums in different countries that exemplify the differences in the ways of living and traditions in different European countries. Furthermore, each chapter also provides the readers with detailed scientific and technological background on these bread-making processes and information on consumer trends in different countries that can be used to evaluate the current situation and future market scenario for bread and bread-related products across Europe.

The book starts with a first chapter, conceptualized by one of the editors, summarising briefly the history of bread-making, bread and bakery products globally; reflecting also on the wide variety of shapes, flavours and tastes of bread and the current “know-how” and scientific literature explaining the complex reactions (physical, chemical and microbiological reactions) that occur at various stages of the bread-making process for the creation of some of the most widely consumed types of bread globally. Moreover, the chapter also covers the current technologies and scientific developments to improve several stages of the bread-making process that allowed the intensification and widespread production of bread and the expansion of shelf-life of the products that allowed an increase in exports and global consumption of several breads. Following this initial chapter, the book continues by describing different aspects of bread-making, traditions and beliefs associated with this product, as well as market trends, current consumption, recipes and research of different varieties of bread produced and consumed locally in various European countries. Each of these 17 chapters, developed by researchers and experts in the field of food science, focused on the bread-making processes and bread products and traditions of one country and/or region, covering in the present edition the contributions of authors from the Baltic countries (Estonia, Latvia, Lithuania), Bulgaria, Croatia, Cyprus, Germany, Greece, Hungary, Italy, Latvia, Malta, Poland, Portugal, Romania, Spain, Turkey and Ukraine.

The readers of this book will discover the history and evolution of bread, a current and ancestral staple food product that developed alongside the human race, resulting in a wide variety and range of interesting traditions and ways of bread-making that were preserved and passed on through generations in different countries and that led to the current wide variety of clearly distinctive products locally produced in different regions in Europe. Intriguing associations and beliefs associated with the process of bread-making and consumption, including myths, religious rituals and oral traditions in different regions, mix in this book with scientific knowledge on the changes occurring in flour for the creation of different bread products. A book in which tradition mixes with scientific knowledge and ancestral know-how that is passed on from generations and still pervades in different regions, coming to the present to enrich our knowledge and understand the present and future direction of this food product that will forever be linked and continue to evolve together with the humankind.

I hope the science and stories curated in this book can help to preserve and keep these traditions, myths, legends and products alive, so future generations can discover, enjoy and benefit from this ancestral knowledge.

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Chapter 18

Traditional Ukrainian Bread Making



Svitlana Mykolenko, Tetiana Lebedenko, and Andrii Ziubrovskyi

1 Introduction

The cult of land, crop farming, grain and bread in Ukraine is known for a long time; traditions of grain production are the basis of life, folk culture, ethnicity and life of Ukrainians. Beginning of grain production in the territory of Ukraine dates back to 7000–6000 BC. It is associated with the Trypillian culture, and extension of the experience of growing hulled wheat, rye, barley, millet, as well as peas, flax, lentils (Pashkevych and Videiko 2006; Pashkevych and Bohuslavskyi 2019). It is thought that hull-less wheats (Fig. 18.1a) appeared in crops on the territory of Ukraine only in 1000 BC, initially on the limited area in the Northern Black Sea region, owing to the Greek colonists. Since that time, the value of hull-less wheat increases, and in the findings of the Ancient Rus (800–1000 AD) this wheat (together with spelt) already occupied a dominant place. Spelt in the territory of Ukraine had been grown since the Neolithic era (5000–3000 BC) and continued to exist until the late Middle Ages (Veremeichyk and Pashkevych 2004).

Grain crops were considered “the reliable bread”, one of sustainable sources of energy and nutrients; they were used both for human consumption and for the feeding of livestock. Grain crops were used to make cereals for cooking porridges and soups, and also for making beer and vinegar. Various types of flour were obtained from one-grained and two-grained wheat, which differed significantly in color and technological properties, therefore the spheres of use, baked goods, and bread

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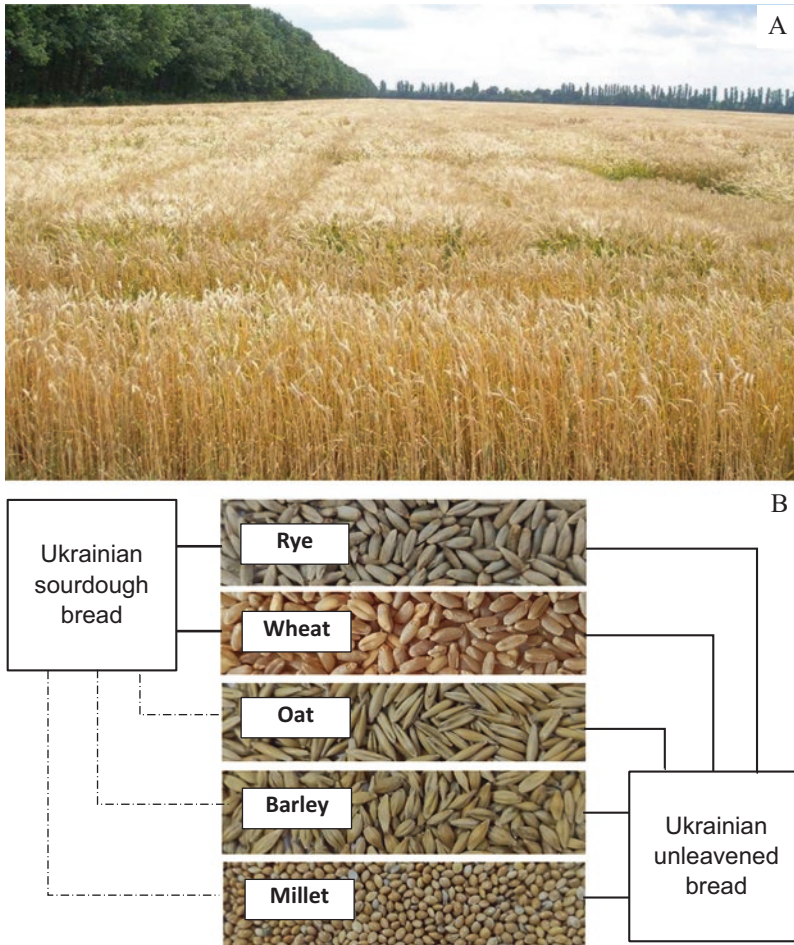


Fig. 18.1 Wheat field before harvesting, Dnipropetrovsk region (a); Cereals in Ukrainian bread making (b)

products made of them were also different. The ancestors of Ukrainians had the skills to bake unleavened bread since 4000 BC, which is evidenced by the clay models of loaves found in settlements on the territory of the modern Ukraine (Videiko 2011). There is no consensus among scientists with regard to the source of dough fermentation method in Ukraine, and the exact timeframe for the beginning of its use in bread making are not known as well. The time of appearance of sourdough bread is mentioned in various sources as 300–400 AD (Glushko 2012; Ziubrovskiy 2012). This opinion is explained by the borrowing of the term of Gothic origin for the name “hlaifs” of sourdough bread before 600–700 AD, which is confirmed by the findings of ritual clay loaves of white bread, imitating the baked bread, in the Slavic settlements. Although, taking into account the close links with the ancient Greece, indisputable existence of the Greek city-states of Tira, Olvia and

others founded in 700–500 BC in the northern Black Sea region, it is worth noting that spreading of the tradition of sourdough bread making came much earlier and from that region, and the term “*khlib*” (bread in Ukrainian) can be derived from the ancient Greek word *clibanos* (the name of the conical pan for baking).

The first documented mentions of the sourdough bread making date back to the times of the Kyivan Rus, namely 1100 AD, which prove the use of various types of sourdough and recipes in Orthodox churches, monasteries and households (Artiukh 1977). It is believed that discovery of the sourdough bread is conditioned by the fact that the dough remaining in the uncleaned kitchenware began to ferment and turned into the leaven, which promoted fermentation in a new dough (Sumtsov 1885).

2 Role of Bread in the Life of Ukrainians

Bread was the most important food product of the ancient Ukrainians; that's why in the ideas and traditions it is closely connected with holiness, joy, happiness, health, well-being, cordiality, hospitality, the human life and magic power (Yarynychna 2011). Bread and basic concepts about it remain one of the greatest materials and spiritual values for the population of Ukraine as heretofore. Its recipe, technology of production, appearance and quality contain the national and cultural information (Artiukh 1977).

Ukrainians have formed both the respect for bread as an essential food product, and the reverence for it as a Gift of Heaven. The Gift of Heaven in Slavic mythology is a Gift of Svarog, the Father of Heaven, Earth, and Sheaf. The sheaf is one of Svarog's names. Bread symbolized the life and therefore it was worshiped as the Sun. Since ancient times it was baked in the mold resembling a celestial body. The ritual bread *kruzhalo* (sweet bread of round shape) was made in the form of the Sun with rays in honor of its birth on Christmas Eve (Koliada). At a later time, the Nativity of Jesus and celebration of Christmas were timed to coincide with it, with the obligatory presence of Christmas *kalach* (a kind of fancy loaf) on the table. Furthermore, bread in the minds of people was a symbol of the Mother, Family and Kindred; in the ideas of the natives of Trypillia it meant fertility. Bread and grain became the center of ritual actions in the life of the ancestors, the basis of agrarian magic at the beginning and in the course of field works, the main attribute of celebrations that were supposed to bring happiness to the family (Tvorun 2006; Rusavska 2013). Everyday and ritual breads represented a quintessence of food, embodiment of wealth, affluence, hard work; they outlined the social status and authority of the family in the rural community.

The ritual bread is an essential companion of the calendar holidays such as Christmas, Annunciation, Easter, Ascension Day, St. Vasyl and Dmitry holidays etc. Besides, bread is an all-encompassing sign of charity, sincerity of feelings, and kindness. It was especially evident during the holidays. At Easter, wealthy peasants baked bread and brought it to the church together with the Easter foods so that all this would reach the poor. Extremely high status of bread is evidenced by the

existence of an established set of regulations with regard to conditions of its baking. At the same time, bread was almost the only element maintaining the subtle connection between the world of the living and the world of the dead. Ukrainians believed that souls of the dead were fed and remembered by steam of bread, taken from the oven and especially – broken into pieces and laid out on the windows. The continuity of traditions, special attitude of Ukrainians to bread was ensured by the transmission of information orally through people's art – fairy tales, folk ballads, legends, myths, proverbs, songs, etc. (Boriak 2017).

From generation to generation, the people nurtured respect for the work of the grain grower and bread as a supporter of the family. The ancestors of Ukrainians saw the highest essence in a simple loaf of bread. That is why there are so many sayings about bread: “Bread is the staff of life”, “No lunch without salt and bread”, “All good is in bread”, “With bread and water, there is no hunger”, “Bread and water are Cossack foods”, “Bread is the father, water is the mother”, “Lack of bread means disaster”, “It is half lunch without bread”, “When there is bread, there is a reason”, “When bread is on the table, the table is a throne, and if there is no piece of bread on the table, it is a bare board”, “With bread the song is sweeter, and the house is warmer” etc. (Vivat 2016).

Associations of the type “baking cycle – human life cycle” in the Ukrainian folklore are most vividly reflected in Podilsky, Carpathian, Pokutsky, Polisky, and Slobozhansky fairy tales. They refer to so called “life and suffering of bread”: personified bread talks about its tormented life (from “the birth” in the field/during leavening till “the death” when eating), thus driving away various demonological characters (devil or mermaid) or preventing crimes. Similar views are also reflected in the Ukrainian riddles: “I do not live or walk, but I know seven troubles and I die from a knife (bread is sown, threshed, milled, fermented, kneaded, baked and eaten)”. Many popular beliefs and signs are connected with bread. It was forbidden to knock on bread in Boykivshchyna, as the people believed that bread was alive. According to behavior of the dough/pieces of dough during cooking, and quality of the ritual bread the features of the next year were predicted for the family. In the corner of a room, under the holy pictures, once there was a loaf of white bread covered with a towel (Tvorun 2006). In Ukraine, bread and femininity were identified in the structure of values: the woman crowned the results of work of grain growers by making bread for the family.

The attitude to bread as a sanctuary has the abundant reasons. It has been and remains a continuous and stable source of energy, a complex of vital nutrients for almost everyone throughout his/her life, it is not possible to be fed up with it, and it improves the digestion of other food products. The nature provided the grain with the ability to preserve its nutritional and biological value, as well as technological properties, for a long time, thus it has become a measure of well-being and national wealth (Iorgachova and Lebedenko 2015). In hard times, significance of this product grows, because due to its unique composition a person can sustain “by bread alone”.

Ukrainians have always consumed a lot of bread. It is estimated that the Ukrainian peasant in the early twentieth century AD consumed about 1 kg of bread a day.

Owing to bread, the caloric content of the daily diet was supplemented, and proteins, carbohydrates, dietary fiber, vitamins, macro-, microelements, etc. were obtained. The content of nutrients and biologically active compounds, their digestibility largely depend on the flour, recipes and production technologies (Mykolenko et al. 2019). That is why the traditions and experience of bread making were kept in families and passed down from grandmothers and mothers; the process of baking was shrouded in mystery and required a special approach, allocation of time, place, clean environment, inspiration, household tools etc. Making bread for the family was exclusively an occupation for women; only when bakeries appeared, i.e. baking was done outside the homes, the right to bake bread began to pass to men.

In general, bakers and the process of breadmaking enjoyed a special honor in the mass consciousness of Ukrainians. Bread had a sacred meaning; as before, it is a mandatory attribute of Ukrainian rituals, everyday product representing an essential source of nutrients and physiologically valuable compounds.

3 Types of Traditional Ukrainian Bread

Ukrainian bread combines extremely wide variety of bread products; today their range includes more than 1.5 thousand items. The type of bread depends on many factors including: (1) type and grade of flour; (2) product recipe; (3) method for preparing of the dough; (4) method of baking; (5) shape of products; (6) purpose, time and place of consumption etc.

These factors have changed and modified over time, which affected the range and quality of bread products. For a long time, the priorities of Ukrainians, as well as humanity as a whole, were aimed at selecting the species and varieties of plants with higher yields, resistance to adverse soil and climatic conditions, and better technological properties to obtain nice and tasty bread products. Approaches to flour production and organization of breadmaking were aimed at facilitation, reduction of time and resources, stabilization of the fermentation process and achievement of the predicted product quality.

1. In the modern Ukrainian baked foods, bread products of white wheat flour prevail; however, the information about growth of pathological sensitivity of people to its components gives cause for concern and becomes a subject of research (Rybalka 2017). Therefore, the demand for rye flour products is growing, and whole-meal bread and flour of the ancient cereals, such as hulled einkorn and spelt, gain popularity (Mykolenko and Gez 2017). Besides, addition of flour made of barley, millet, oats, buckwheat, corn, soybeans, peas, beans, etc., and development of gluten-free products are in common practice. The experience of using different types and varieties of flour, valuable for bread making, is carefully preserved in the national traditions of the various regions of Ukraine (Glushko 2012; Ziubrovskiy 2016).

2. The formulation of bread determines to a large extent its quality, nutritional properties, and whether it is simple (made of flour, water and salt) or enriched bread (with dairy products, sugar, butter, oils and other ingredients added), possibly rich with high content of sugar, fats, and also eggs, raisins and other ingredients. It also defines mostly the purpose of the product (for fasting, holidays, everyday use, or rituals) (Tvorun 2006).
3. Traditionally, two methods of dough making and, accordingly, types of bread – unleavened and sourdough bread, existed in parallel in the territory of Ukraine (Fig. 18.1b). Making of dough and these types of bread, as well as symbolic properties and functions of each of them, have their own characteristics. The simplest and oldest way of breadmaking consisted in moistening of barley, wheat or rye flour with water and kneading of dough, which was baked in ash or on the hot stone. Archaeological findings testify to the older origin of unleavened bread (6000 BC) compared to the sourdough bread. Nevertheless, it was spread throughout Ukraine until the end of the nineteenth century AD. Today it is still found in the Carpathians territory as the ritual unleavened bread. To this day, *vertuta*, *palianychka* and many other baked goods are made here of unleavened dough. Earlier appearance and long-term preservation of traditions of unleavened bread *pechyvo* were promoted by simplicity, high speed, lower demands to quality of flour, conditions of dough making and baking process. Besides, the long history of unleavened bread in the territory of Ukrainian Carpathians and its relative diversity can be explained by the natural and climatic conditions, due to which it was necessary to plant frost-resistant crops, namely oats and barley. Recipe of unleavened bread of wheat flour is kept in the South of Ukraine, the development of which was significantly influenced by the Turkic-speaking ethnic group (Glushko 2012, Ziubrovskiy 2016). Making sour (“leavened”, “yeasted”) dough and fluffy bread is a long process, requiring wheat flour with the higher content of gluten or rye flour, introduction of the initiator of fermentation, special baking regimes and sanitary conditions in the room, as well as presence of clay ovens in combination with skill of the housewife (Ziubrovskiy 2012). However, such products are tasty, flavory, easier to digest, so they became widely spread.
4. Baking of unleavened and sourdough bread also depended on the method of heat treatment and technical and design features of a heating device (oven) (Fig. 18.2a). In the presence of the open flame, i.e. higher temperatures from the surface, flat unleavened cake *korzh* could be made only. Appearance of the ovens with half-closed flame in the early Slavic period and later on with the closed flame due to moderately high surface temperatures and hot air in the oven allowed baking of sourdough bread, which had sufficient volume and fluffy crumb (Siletskyi 2001; Petrauskas and Koval 2012). According to various estimates, sourdough bread was spreading in the central and northern regions of modern Ukraine in the seventh to eleventh centuries AD. At the same time, the basics of dough fermentation technology, views about this process, rituals and rites that accompanied it were formed. It is believed that appearance of clay ovens (with closed fire) and spreading of cereals suitable for baking (hull-less wheat, rye) contributed to the



Fig. 18.2 Clay oven. K. Sheptytskyi Museum of Folk Architecture and Everyday Life, Lemkivshchyna (a); Kneading trough with the lid (*vik*) for kneading of the sourdough (b); *Nochva* (*netska*) for kneading of unleavened dough (c); Bread peel and fire hook (d)

tradition of sourdough bread making in Ukraine (Ziubrovskiy 2016). Today in the rural areas of Ukraine you can find wood-fired stone ovens and clay-stone ones, which are used for heating, cooking and baking. There are also modern analogues of such ovens made of brick, stone or metal (cast iron) for baking at home or in mini-bakeries and restaurants.

5. Unleavened and flat cakes were baked in different ways: directly on the “bottom” of the open fire or traditional wood-fired clay oven; on the coals or in hot ash; on hot stones, clay or iron pans (Ziubrovskiy 2016). Sourdough bread products were made only in the clay oven directly on the bottom or in special molds, into which the dough pieces were placed with a shovel (peel), sprinkled with flour, if necessary.
6. The cult of bread in Ukraine and its continuous consumption led to the division of bread products into everyday and ritual bread, dedicated to calendar and family holidays.

6.1 Ukrainians usually baked sourdough bread once a week. However, in the period of intensive labor activity they refused baking such sourdough bread completely or partially. Instead, they made bakery goods in a quick way. This bread was baked of partially fermented dough in the form of so called *palianytsa* during firing in the furnace. These products were made daily and usually consumed immediately or during the day. Traditional Ukrainian unleavened bread products were not fermented ones; they were more difficult to digest and assimilate. Therefore, they were often consumed with fermented milk products. As distinct from unleavened bread (*oshchypok*, *korzh*, *pechyvo* etc.), the dough for which was kneaded with water, milk or whey and gently rolled with a rolling pin, the technological process of sourdough making was much longer and more complicated.

Everyday sourdough bread (*khlibyna*, *bokhanets*) was made in Ukraine mainly of wheat and rye flour. People living in the territory of Polissia, Volyn, Boykivshchyna, Lemkivshchyna and some other historical and ethnographic regions of Ukraine consumed mainly the bread made of rye flour. In the central and southern territories of the modern Ukraine, where mostly wheat was grown, more wheat sourdough bread was produced. In lean years, peasants added barley, buckwheat, pea, lentil flour, and from the nineteenth century AD – ground corn and mashed potatoes, to wheat and rye flour. Beets, boiled beans, bran, chaff, white goosefoot and even an acorn flour were added to the bread dough in the years of famine. Also, bread of the oatmeal was widely spread in the territory of Boykivshchyna and Lemkivshchyna, and corn meal bread was popular in Hutsulshchyna, Northern Bukovyna and lowland parts of Transcarpathia region (Ziubrovskiy 2010, 2013).

- 6.2 Ritual breads (Figs. 18.3, 18.4 and 18.5) were baked for each holiday during the year; they differed in recipes, technologies, shapes of the product, and these traditions in each region of Ukraine have their own peculiar features. Breads for calendar holidays carry magic power, they were baked from the

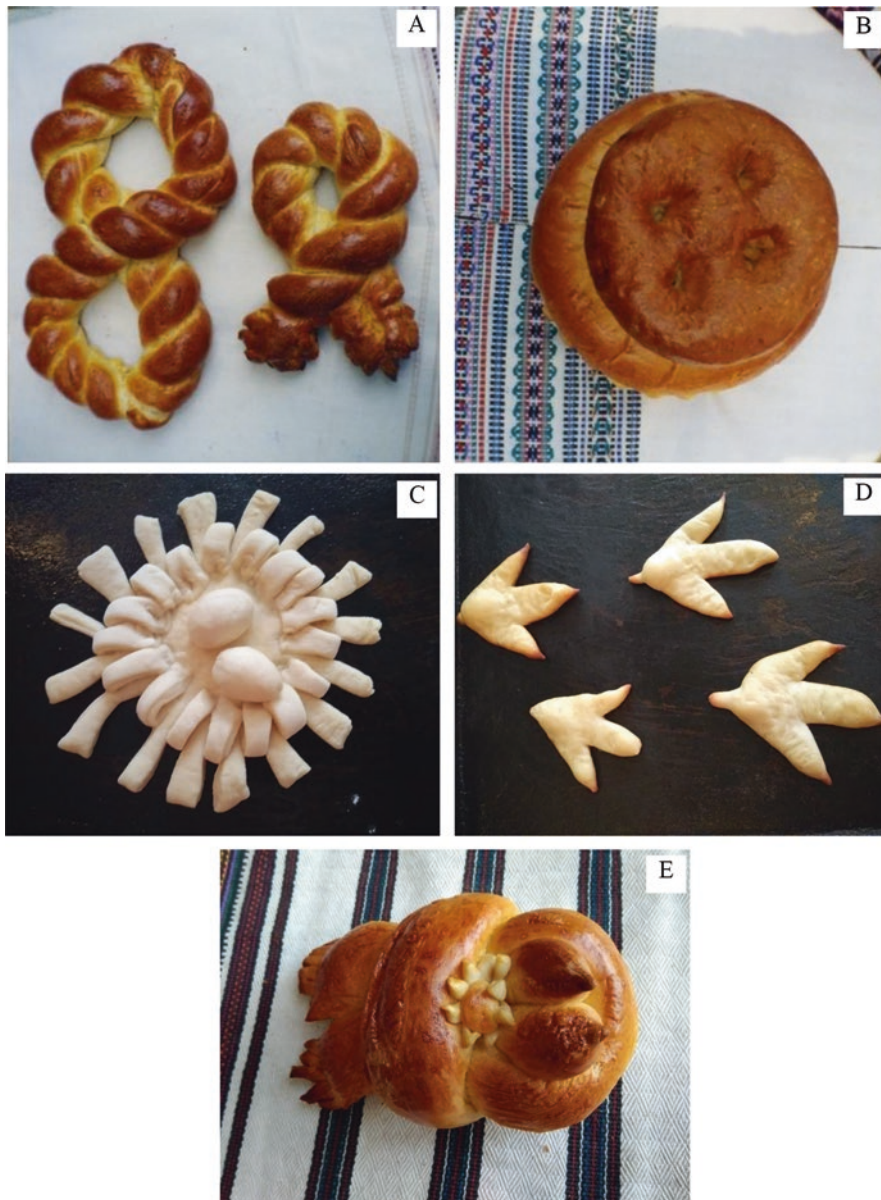


Fig. 18.3 Eight-shaped *rizdvianyks* (a); *knish* on Christmas (b); “Stork nests” (c); and “stork paws” (d); on the Annunciation Day. Wedding “geese” (e)



Fig. 18.4 *Korovay* bakers with the trough (a); *Korovay* to be handed out as a wedding invitation (b); *Korovay* bakers with rectangular *korovay* (c); *Korovay* of the god mother (d); *Korovay* of the bridegroom (e)

best raw materials in a certain atmosphere, in the endeavor to follow the rules and beliefs kept in each family (Ziubrovskiy 2014b, 2015a).

Ukrainians baked huge amounts of ritual bread, for example, for the winter holidays. Christmas is the first holiday of the year dedicated to the birth of Jesus. For Ukrainians, this holiday also referred to the end of winter solstice and the beginning of a new annual solar cycle, birth of the Sun. On the



Fig. 18.5 Meeting foreign guests with *korovay*, Vinnytsia (a); Girl with *obzhynok* (b)

eve of the Christmas time, there is a tradition to bake a variety of ritual breads (Tvorun 2006; Glushko 2012; Ziubrovskiy 2016; Konopka 2019). Christmas *kalach rozhestvo* of the sourdough is formed of two or more ropes and placed into a round mold, associated with the Sun, Dazhbog and Koliada holiday. For the fertility and large yields, *kalach* products were made eight shaped (Fig. 18.3a). Children-Christmas carolers were treated to small “doves”. *Knish* (a kind of wheat bread) was made with the “small loaf” for the bodiless powers or soul as a symbol of unity of generations and patronage of ancestors (Fig. 18.3b). The Christmas Ukrainian bread “Tri-light Deity” consists of three ritual loaves which are placed on top of each other: the upper “master’s” (“Holy Christmas”) baked of rye flour; medium (“Vasyl”) and under Jordanian *kalach*. This design symbolizes three biggest winter holidays – Christmas, Vasyl (the Old New Year) and the Epiphany Day, in this sequence the bread is eaten by the family on the appropriate holidays. It indicates that the rye “master’s” bread supports life. “Vasyl” was baked of rich wheat dough in the form of a very beautiful and large New Year loaf (*korovay*) decorated with magical signs, such as “cross”, “birds”, “grass snakes” etc. “Vasyl” was given to boys-Christmas carolers as a treat. Jordan *kalach* made of wheat flour was brought to the church. Sometimes it was eaten by people present on the holiday or consecrated in the river (Tvorun & Tsvigun 2019).

Bread and other flour products accompany Ukrainians on the other holidays and calendar events as well. “Honey cakes” of unleavened dough were baked on the Candlemass Day, *varenyky*, *mlyntsi* (pancakes, “rolls”) – on the Pre-Lenten festival; *zhylianyks* or *duzhyks* of unleavened dough – during the

first week of the Lent, *khresty* (“cross-like” cookies) – during the fourth week of the Lent, “larks”, “doves” or “nightingales” – on the Forty Martyrs Day, “stork nests”, “stork paws” (Fig. 18.3c, d) or *gallepy* of unleavened dough – on the Annunciation Day; *paska* (*baba*) of rich dough – on the Easter Day. *Mykolaichyks* of unleavened dough were made on the St Nicolas Day (in spring and in winter), *palianytsia* (*manzar*) – on the Holy Trinity, of yeast or sourdough with fillings, *knish*, *mandryk*, *perevertanyk* (*pampushka*) on St Peter and Paul’s Day; *korzh* of unleavened dough – on the Maccabees; Savior’s loaves, *pampushkas* – on the Savior Day. Holiday *kalach*, *vertutas*, *verguns*, and “family” pastries were baked for the celebration of the Dedication Day; *kalyta* (*korzh* with a round hole) or *malais* made of unleavened dough, sometimes with the lovage, – on the Andriy’s day etc. (Tvorun 2006; Glushko 2012).

From the dawn of time, Ukrainians did not have a single family holiday without bread. When a baby is born, this event is celebrated with bread, and the giving of “christening” *kalach* is the most solemn moment of the baby’s Baptism. A child was sent to school with bread, and a married couple is blessed for their life together with bread. *Korovay*, *karachun*, *kalach*, *shyshka*, “dove”, “geese”, (Fig. 18.3e) accompanied the wedding (Tvorun 2006; Zuber 2017; Petrova 1998).

Korovay is a high round or rectangular bread decorated on its top with flowers, cones, cross, birds, and green snakes (Fig. 18.4). The quality of the *korovay* baking determines how the young couple would live together. *Korovay* is the crowning dish that stands out among others and becomes a cult symbol having the magical properties (Tvorun & Tsvigun 2019). Ukrainians most often baked *korovay* in the houses of the bridegroom and bride on Thursday before the wedding. Only these two *korovays* were needed at the wedding, but guests could also bring their own. Some *korovays* were a part of the gift, and sometimes they replaced it completely. Two main wedding *korovays* were subject to the most stringent requirements. Mainly, they were made of refined wheat flour of the best quality. Unlike the ordinary sourdough bread, *korovay* was a multi-recipe product including eggs, butter, and milk. Such ingredients were brought for making of a *korovay* by specially invited women, i.e., *korovay* bakers (Fig. 18.4a). They were in the even number, from four to eight, in order to ensure a happy life for the married couple. *Korovay* bakers were chosen according to the certain criteria: they could be married women of childbearing age, happily married. Widows, pregnant women and “divorcees” were not invited (Ziubrovskiy 2010). Children were invited to prepare sponge for the *korovay* to ensure the fertility of the young couple. After that, the dough was blessed: the father crossed it with a whip, and the mother poured a glass of horilka. *Korovay* was kneaded by the *korovay* bakers, who accompanied this process with songs (Petrova 1998). During processing of the dough, a special cone was made in the center of the *korovay*, where money was baked. Besides, spiced rye spikelets were baked in it, symbolizing “a couple”. Together with the

korovay, the bakers also made the “cones” – pieces of twisted rich dough, resembling the cut top of a cone in their shape. In addition to the apron or kerchief that the mother of the bride or bridegroom tied to the baker’s hand, were a kind of payment for the baking. Although the *korovay* ritual in Ukraine no longer contains all the traditional stages, *korovay* remains an integral part of the Ukrainian wedding in the twenty-first century AD as well (Tvorun & Tsvigun 2019).

Ukrainians also welcome their distinguished foreign guests with a *korovay* on the special embroidered towel *rushnyk* (Fig. 18.5a). Meeting guests with *korovay* is an expression of good intentions and respect of the host party. In order to demonstrate their good intentions and respect for Ukrainians, guests should bow to the bread and kiss it. It is not necessary to break off pieces of the *korovay*, to bite and chew them. After kissing, the people just take it away and taste at a time convenient to them; one can bring the gift *korovay* to his/her country as an edible souvenir (Tvorun & Tsvigun 2019).

Traditionally, bread as a sacred thing and the God’s Gift, a magical product for the good harvest, was used as a ritual object, accompanying the peasants in the grain growing process – when sowing, visiting the grain field, during the harvesting, harvest festival (*obzhynok*, Fig. 18.5b) etc. (Tvorun 2006).

Types of traditional Ukrainian bread are rather diverse; they are the property of Ukrainians and means of their national identity. They are symbols of fertility of the Ukrainian land, centuries-old culture, wisdom and skill of people inhabiting the territory of Ukraine.

4 Grain and Flour in the Traditional Ukrainian Bread Making

Today, hull-less wheat flour plays an important role in the traditional Ukrainian breadmaking. In terms of its nutritional value and bakery properties, wheat meets the requirements of farmers and bakers and is the result of creative work and talents of many generations in scientific selection and developments in bread production (Pashkevych and Bohuslavskyi 2019). However, in recent decades a heated public debate broke out with regard to safety and immunoreactivity of the wheat gluten, sensitivity of the human body to its components, and its possible negative impact on the health (Pashkevych and Bohuslavskyi 2019). Therefore, attention is returned to flour made of alternative types of cereals, genetically close to Ukrainians, and other types of cereals, as well as less refined flours.

So, at present time one- and two-grained hulled wheat deserves attention, first of all, for making bread products for the dietetic and healthy nutrition. They were the first crops grown by the natives of Trypillia (from 6300... 5500 BC), together with

hulled and hull-less barley, peas and lentils. One-grained wheat flour is of yellow or brown color; the bread made of it is of dark-brown color. Flour of two-grained wheat (einkorn) is of white color and more valuable by its chemical composition, compared to the modern wheat varieties. Bread products of such flour are tasty, flavory, and nutritious; they are easily digested, contain more proteins, unsaturated fatty acids, vitamins and minerals (Babenko et al. 2017; Mykolenko and Omelchenko 2020). Besides, Trypillian people were growing spelt on their fields, as recorded in the materials from the territory of Dniester-Prut interfluvium in 5000 BC. Replacement of hulled wheats by hull-less wheats in the territory of Ukraine occurred at the turn of 1000 and 2000 AD from the Northern Black Sea region, where hull-less wheats cultivation began at the end of 1000 BC (Pashkevych 2005). Numerous traces of spelt were discovered in the paleobotanic findings of the Carpathian mounds (200–400 AD), and the materials of hull-less wheat and spelt prevail in the findings of the Ancient Rus (800–1000 AD). Both spring hull-less wheat and winter hull-less wheat were cultivated in Ukraine in the tenth to thirteenth centuries AD; the first variety was found in the northern regions, and the other one in the south of the modern Ukraine. From the thirteenth century AD, hull-less wheat already dominated among the cereals in some regions of the modern Ukraine (Middle Dniipro basin), which contributed to the spread of sourdough bread making. In the late nineteenth century AD, spelt was one of the main plants of Bessarabia. In the early twentieth century AD the crops of hulled wheats due to their good adaptation to temperature fluctuations and depleted soils preserved in the Crimea and Subcarpathia (Veremeichyk and Pashkevych 2004). Flour of hulled wheats, despite the technological difficulties in their growing, obtaining of flour and products, is considered a promising raw material for bread, because it has a combination of amino acids and composition of nutrients and biologically active compounds valuable for the human body; they are less reactive as well (Rybalka 2017).

Rye and oats, well known in our time as cultivated plants, appeared in Ukraine quite late; they were considered for a long time as contaminants of wheat and barley. It is known that findings of oats, which contaminated the wheat crops, date back to 2000 BC. However, farmers of that time already knew its taste and fodder properties. The earliest findings of the cultural form of oats refer to 700–500 BC in the Western region and 100 AD in the Southern regions of Ukraine (Pashkevych and Bohuslavskyi 2019). In the Ancient Rus, according to the chronicles of 997 AD, oats were grown together with wheat and used mainly as a fodder, but also as food ingredient, for example, for the alcoholic beverages production. Use of oats for making of unleavened bread products was the most common in the mountainous territory of Ukraine, i.e. in the Carpathians and Subcarpathia regions (Ziubrovskyi 2016).

Increase in findings of the rye was recorded in the monuments of the Scythian period (900–300 BC). The first mentions of rye growing in the chronicles of the Ancient Rus date back to 1056–1115 AD. According to paleobotanic studies in the Middle and Northern Dniipro basins, rye and hull-less wheats were primarily grown there in the tenth to fourteenth century AD (Veremeichyk and Pashkevych 2004). Apparently, rye, which accompanied wheat in crops in the northern regions, has

gained an advantage due to higher frost resistance. Winter and spring rye not demanding with regard to soils and climatic conditions and having high biological value occupied up to 50–60% of the sown area in some regions of Ukraine in the early twentieth century AD.

Barley also played an important role in the diet of Ukrainians for thousands of years. It was used to prepare porridge, products of unleavened dough, *korzh*, *yashnik*, oat-barley cakes, and also mixed with wheat or rye flour into sourdough. Its sown area in 1900 AD only in the southern regions of Ukraine was about 25%. Barley was grown in rather large quantities since it was used in making beer and horilka. Besides, barley, as the wheat, was the commercial crop exported abroad in large volumes (Artiukh 1977).

Archaeological and written sources indicate the long history of cultivation of the millet in the territory of Ukraine. Millet grains were found during excavations of settlements of the Trypillia culture. According to archaeologists, millet was one of the most characteristic cereal plants of the Scythian era. Scythian farm workers were making flat cakes of millet, which was pre-moistened, dried and pounded in mortars. Millet became especially popular in the era of the Kyivan Rus. Its crops were found throughout Ukraine (Pashkevych 2014; Gorbanenko 2015). It is known that before the twentieth century AD millet was used for the production of bread as an additional ingredient.

Species and varietal composition of flour used by Ukrainians differed depending on the region. For example, people in Volyn and Polissia traditionally made bread of rye or rye-wheat flour; in Podillia, Middle Dnipro basin, Slobozhanshchyna – of wheat or wheat-rye flour; in the Ukrainian Carpathians (Boykivshchyna, Lemkivshchyna, Hutsulshchyna) – of the oatmeal, barley and corn flour in Hutsulshchyna. Consumption of unleavened bread of the oats, barley or corn was typical not only for mountain regions, but also for certain foothills (Pokuttia, Pidhirya) and plain (lowland Transcarpathia, plains of Bukovyna) territories of Ukraine. Numerous recent studies approved the expediency reviving the national experience of using different types of cereals in bread making to balance the daily diet (Arsenieva and Arsystenکو 2009). Usually, everyday sourdough bread was made of whole-meal flour. White or refined wheat flour was chosen for the festive ritual bread. A mixture of two or more types of flour was often used for bread making (Ziubrovskyi 2016; Glushko 2012).

Grain for baking flour was ground on the manual rotary millstones, horse-drawn millstones, wind-powered mills or water mills. The technical support of grain milling depended on the time, territorial features and wealth of Ukrainians. Most often, Ukrainian peasants were grinding the grain at home using simple rotary millstones. After grinding, the grain was screened on sieves to remove inorganic inclusions and large peripheral particles of the grain (flower and seed shells, germ), which were poorly ground due to high content of food fiber and fat. Thick-walled wooden containers were used to store the flour to prevent the appearance and reproduction of pests in the flour.

5 Technical and Auxiliary Means and Accessories for the Production of Traditional Ukrainian Bread

Ukrainians have long believed that the house is kept by three things: kneading trough, oven and *pokut* (“corner of honor”) (Boyan-Gladka 2017). The kneading trough was the central component of the process of traditional Ukrainian bread making (Fig. 18.2b), which was used to make sourdough. Unleavened dough was kneaded in a wooden trough (*netska, nochva*) (Fig. 18.2c), which was also used in making of the sourdough for ritual breads (Ziubrovskiy 2014c). Bread trough was cone-shaped or cylindrical cooper’s product with a push-in bottom and removable cover *vik*. Obtaining the active spontaneous sourdough was directly associated with the design of the trough, since there were gaps between its individual segments. In between there were pieces of dough that accumulated microbiota productive for baking (yeast and lactic acid bacteria). Accordingly, prevention of drying of the kneading trough was a necessary precondition for the fermentation process (Ziubrovskiy 2012; 2016).

The rivets for the trough were made of tree species such as pine, spruce, linden, maple, sycamore, fir, oak and beech. The choice of such wood species was conditioned by the need to ensure the functional strength and water resistance of the trough. Its bottom was usually made of oak because this tree is the strongest one, which contributed to better preservation of the product. The trough was often made with mixed (oak and pine) rivets, which, according to Ukrainians, contributed to better fermentation of the dough (Ziubrovskiy 2015b). The trough was covered with a *vik*, i.e. round lid made of thin boards, sometimes connected at the ends in a lock, or a linen towel was used to cover it. Besides, the necessary precondition for the rapid and successful maturation of the sponge and dough in the trough was considered to be correct location of the rivets: they should be placed similarly to the direction of growth of the tree of which they were made.

Ukrainians preferred the old trough, the surface of which contained a potential supply of microbiota formed by long use of the trough. The use of a new trough required prior preparations. Such trough was pre-soaked for a day with water at room temperature with buckwheat straw, or chaff and buckwheat straw, to eliminate the natural smell of wood. Only then, the first leaven was made or a piece of dry bread was poured over, and the mixture was placed into the trough. Sometimes the trough was lit by burning a handful of flour in the closed trough for a few minutes.

The trough was treated with care and respect. The trough filled with dough was placed on the table or bench under the holy images in the corner of honor and covered with towels. Sometimes the trough was placed on a bench by the bed. The trough was usually not thrown away. Even if the trough was completely worn out, it was believed that it could not be used for anything other than storing bread. The trough was more often scraped than washed in order to preserve the microbiota useful for baking. However, if the Ukrainians washed the trough, they rubbed the walls of it with onions and salt.

Almost in all territory of Ukraine, except the Ukrainian Carpathians, sponge was prepared using a wooden spoon or paddle-shaped peel (often made of oak or pear),

named *kopystka*, *kopistchynka*, *kopystochka*. *Kopystka* as a sacral object of the bread making was used exclusively for this purpose. Leavens with spontaneous microflora inherent in the traditional bread baking of Ukrainians were unstable, especially at the early stage of fermentation. It was believed that the use of *kopystka* in the kneading of dough prevents the introduction of microflora from the hands into the dough and the associated deterioration of the sponge fermentation.

Oven in the houses of Ukrainians (Fig. 18.2a) was used for cooking and heating purposes (Babenko 1905; Veremeichyk and Pashkevych 2004; Petrauskas and Koval 2012). The oven was an integral attribute of a traditional Ukrainian house which played an important economic and magic role. With its help, the food was prepared, and also various ritual actions were performed relating to the cleaning function of fire. With the improvement of human habitation, the clay oven changed its shape and location, while retaining the original ritual significance (Boyan-Gladka 2017). In a perfectly designed clay oven housewives could effectively use the heat energy, because the oven was heated by hot bottom, walls, hot air and thermal radiation. It usually took up to 2 h to heat the oven to the temperature required for baking bread (Shcherban 2016). Maximum amount of bread that could be baked in the oven depended on its size, and ranged from 8 to 10 loaves.

The base of the oven was most often made of clay straw, in the houses of Polissya and Carpathians the oven edges were primarily made of wood, in the south and Transcarpathia – of natural stone. In the Dnipro basin the base of the oven was made of clay straw, sometimes with the addition of stone, or made of brick (Petrauskas and Koval 2012; Yevseieva & Petrenko 2018). Clay oven consisted of the oven itself, with the lower part named *komin* (exhaust pipe), roof or jaws and a hearth with fireplace to extract smoke into the chimney. The space between the oven and the wall was arranged for keeping the cooking utensils. From the fireplace, the hole led to the chimney (*bovdur*) (Babenko 1905). The oven bottom was paved with broken clay, and broken glass or clay fragments were added to it. The bottom was not only the lower part of the oven where firewood was burning, but also a place for baking bread and cooking (Yevseieva and Petrenko 2018). Semicircular jaws arranged in the front wall of the heating device were the only opening through which the products for heating, in particular unleavened or sourdough bread, as well as fuel and air, entered the oven (Glushko 2012).

To obtain high-quality bread, the oven was well heated. For this purpose, the people tried to use the firewood of hard low-smoke wood species: oak, hornbeam, birch, ash, beech, hazel, alder, maple, and acacia. Hornbeam firewood was considered to be the most optimal for housewives with regard to baking sourdough bread. It burned quickly, and generated a significant amount of heat, while heating the bottom well. Wood with various congenital and acquired defects was considered unsuitable as a fuel for the clay oven, for example, it was forbidden to use the wood of trees turned by roots under the action of wind. The people tried not to use willows, pines, spruces, and aspens for heating of the oven while baking bread, because they generated a lot of smoke and soot when burning. However, willow sprouts consecrated in the church on Palm Sunday were burned in the oven during baking of the ritual products, such as Easter cake (*paska*). It was believed that in this way

these products were baked better and their crust acquired the brown color inherent in the baked bread.

The quantity and quality of fuel depended on the type of bread baked (unleavened or sourdough bread). For successful baking of sourdough bread, it should be subjected to long-term heat treatment. Unleavened products, as a rule, had a disc shape and small diameter, compared to sourdough bread, and also they could be baked on the plate, without using an oven bottom. Therefore, baking of sourdough bread represented more energy consuming process (Ziubrovskiy 2014a).

Bread was put into the oven and taken out of it with the help of a special peel made of a wide board (Fig. 18.2d). This peel had a round, semicircular or oblong blade, depending on the type of bread product. The peel for loading of the ritual bread (*korovay*) had very large dimensions of the working surface. The handle of the peel was usually long, because of the size of the oven and the heat from it. The bread peel should be made very carefully and smoothly. For operations with the fire and heat and for “moving” of the bread in the oven, the people used *kotsyuba* (fire hook), hoe-shaped or sword-shaped tool made of wood or iron. Using *kotsyuba*, it was possible to check the readiness of the oven for putting bread into it: the people scraped the surface of the bottom and if sparks bounced, the oven was considered hot enough to load the bread.

In the traditional baking, Ukrainians paid special attention to the use of various leaves – cabbage leaves or leaves of trees – as a bedding when baking bread. Usage of leaves prevented burning and contamination of the bread base. The loaves baked on the leaves were considered especially delicious. Cabbage leaves were most often used as a leaf bedding. The leaves were laid out on the working surface of the bread peel, on top of which a dough piece was placed and put with the use of the peel on the oven bottom. Before use, cabbage leaves were pretreated by cutting off thick veins and stalks. In addition to cabbage leaves, the leaves of oak, maple, linden, sycamore, walnut, and grape were often used as a bedding for bread. In autumn, the leaves of trees for baking were harvested for the winter in large quantities. The leaves collected in the forest were tied into a bunch (*kalytka*, *vinok*), or strung on vine twigs and hung under the ceiling in the pantry or in the house. Before baking, these leaves were scalded with boiling water to straighten them.

Thus, all items related to bread making a priori acquired the high semiotic status, magic power and, accordingly, a special attitude in the Ukrainian family (Borenko 2017).

6 Technological Processes of Ukrainian Bread Making

6.1 Making of Unleavened Bread as a Valuable Experience of Using Different Cereals

Unleavened dough, due to its simple preparation and lower demands to the quality of flour, remains quite popular in various historical and ethnographic regions of Ukraine; it is considered by the modern science of nutrition as a means of

diversifying the diet and increasing its balance by including flour made of different types of cereals.

For the making of *khib* (*korzh*, *pechyvo*) of unleavened dough in the wooden trough (*netska*, *nochva*) water was mixed with salt and flour. Sometimes milk, whey, and fermented milk products were used instead of water; these products contributed to the partial fermentation of the dough, and by adding baking soda as a baking powder. The dough was rolled out with a rolling pin on the tabletop (square plate made of boards with a narrow bar on the one side or around the perimeter), on the table or surface of the chest. After the dough was formed (“laid out into *pliatyky*”), the indentations (“hollows”) were made in it with a spoon, or the dough was “pecked” on top with a knife and put onto the pan, or sometimes directly on the oven bottom. Water vapor formed inside the product during baking could come out freely without forming voids inside the loaf, thus securing its uniform baking (Artiukh 1977).

To this day, the following types and names of the unleavened baked products are known: in Transcarpathia, corn *malysnyk*; in Lemkivshchyna, Boykivshchyna *oshchypok* (from the word “peck”, meaning the method of consumption), *uglianka*, *palenia* (as they were baked in hot wood ash or in front of a fire) of the oatmeal, barley, corn flour or their mixes; in Hutsulshchyna *malai* of corn flour and *korzh* of oatmeal; in Pokuttia *malai* of barley-corn flour and corn-potato *mandeburchenyk*, *korzh* of wheat, barley and rye flour; in Podillia, wheat *zhylnyk* and *korzh* of corn, *lemishka*, *hrechanyk* of buckwheat, *matrotennyk* of peas; in Volyn, rye or wheat *korzh*, wheat *palianytsia*, barley *yashnik*; in the Middle Dnipro basin wheat *shulyk* and rye or wheat *palianytsia*; in the South the wheat *plachynda*, as well as *pita*, *chorek* in the Budzhatsky Steppe (Yatsenko and Kovtiuk 2011; Ziubrovskiy 2016). Ukrainians also make *vergyns*, *vertutas*, pies with different fillings (cheese, potatoes, cabbage, pumpkin, poppy seeds, cracklings, fruits and berries) of thin-rolled unleavened dough (Artiukh 1977).

6.2 Sourdough Bread Combining the Values of Cereals, Power of Microorganisms, Labor and Skill of the Housewife

Making of sourdough bread is a long and complex process. It requires the use of ingredients which chemical and microbiological composition can ensure long-term fermentation and obtain of fluffy bread of high volume, nice shape, bright taste and flavor, which can be preserved longer and digested easier. The emergence of such technology was made possible owing to the accumulation of experience and development of ideas about the basics of fermentation, the first approaches to its regulation and stabilization, the rules of dough processing and baking bread, carefully preserved in families and passed from mother to daughter. These are clear practical recommendations on the choice of ingredients, recipes, time, sanitary and hygienic, temperature conditions, arrangement and equipment of premises, which are intertwined with folk beliefs, magic rituals, legends, etc. (Ziubrovskiy 2015a).

Multi-phase dough making was the traditional process: sourdough, sponge and dough were prepared for wheat bread, and sourdough and dough for rye bread, sometimes using autolyze.

The most difficult and responsible process is the making of spontaneous sourdough or starter; in Ukrainians, it was associated with conception. The process of the fermentation took place precisely due to the presence of active wild yeast and lactic acid bacteria in the sourdough. Their development significantly affected the quality of bread and depended on many factors. Microorganisms were getting into the starter with the ingredients, and as a result of contact with the trough where the batch was made. Along with wild yeast, the accompanying microflora entered into the starter, which could negatively affect the taste and flavor characteristics of the bread, causing its rapid deterioration. Because of instability of sourdough, it is known that bread made in two adjacent households, even by one housewife, could be radically different in its characteristics. Therefore, special respect was enjoyed by women who could make sourdough bread well, i.e. who possessed special secrets and skills.

Such secrets include the following. Housewives began to make bread early, before sunrise, or in the evening. The trough (washed rarely) was rubbed with salt, mixed with the remains of leaven. Then water was poured into the trough, and a piece of dough from the previous baking process (mother-dough) was placed as a carrier of the active fermentation microbiota. They could be called as: *rossh(z) chyna*, *pidroshchyna*, *rozchynka* – Volyn; somewhat differently in the territory of Halytsky Volyn – “*kvadne* dough”, locally in the western part of Volyn – *gushcha*, in the central part – *kisla*; Polissia – *zavaska* (Eastern Polissia), *testo*, *kisto*, *rashchyna* (Central and Western Polissia); Pokuttia – *kvadne* dough; Boykivshchyna – *rozkvad*, *kvad*; Lemkivshchyna – *kvadok*; Middle Dnipro basin – *roshchyny*. In Poltava region, bread was made using *rozkrishka* (a kind of dry leaven). In Podillia Transnistria and Dnipro regions, the people used “homemade yeast” (*pliatok*), the dried sourdough kept till the right time. Sometimes bread was made with the fermented steamed bran or water-flour mixture, which was prefermented for several days (Fig. 18.6).

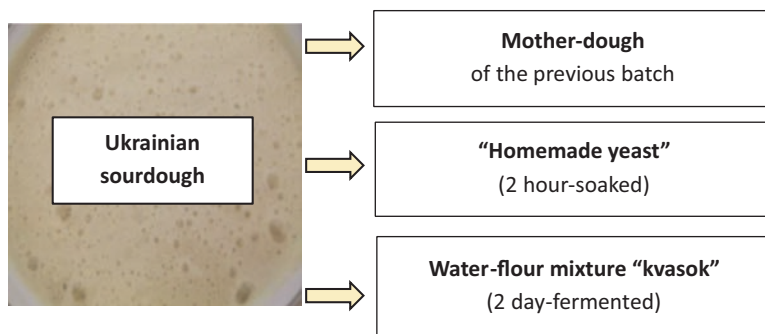


Fig. 18.6 Types of Ukrainian mother-dough in breadmaking

The sourdough was mixed with warm water adding flour to the consistency of thick sour cream and mixed thoroughly. The trough was covered and the mixture was left in a warm place for fermentation. Sometimes this process was running overnight. The sponge of creamy semi-thick consistency, being thinner than the ordinary dough consistency, was considered to be the most favorable substrate for the reproduction of wild yeasts and lactic acid bacteria. This consistency also contributed to the accumulation of acids and aromatic compounds, further improving the proofing of the dough pieces and organoleptic properties of the bread. Thorough mixing of soluble dough, water and flour with a *kopystka* provided the uniform distribution of microorganisms and nutrients required for their nutrition in the sponge (Artiukh 1977; Ziubrovskiy 2010; Glushko 2012). When the sponge completed fermentation and began to settle, it was kneaded, with the addition of the main flour.

For wheat dough a sponge was prepared first, which was fermented. In some regions, for example, in Volyn, it was called *pidkolot* or *pidmolot*; it was used to knead the dough. Wheat dough was kneaded for a long time (from half an hour to 2 h), until it began to detach from the walls of the trough and from the hands. Rye dough of less elasticity did not require long kneading. However, the achievement of specified physical properties was important for both types of the dough. In some places, it was believed that wheat dough should be kneaded until bubbles appear on the surface, indicating a new activation of the fermentation process (Ziubrovskiy, 2018). After that, the dough was left in the trough to rise, kneaded again, then flavoring ingredients, such as dill, fennelflower, salt were added, and the bread was made. The loaves were left to rise, and then baked on the cabbage leaves or oak leaves or directly on the oven bottom. For baking of sourdough bread, oven was well heated, swept with a wet broom and the bread was put using the peel. Bread was baked slowly, mostly for an hour and a half. Then the housewife took out one loaf of bread, put it vertically in her left hand and, knocking from the bottom, determined the readiness of the bread, which was to “ring like a tambourine”. After the bread was removed from the oven, its surface was sprinkled with water and the loaves duly stacked were covered with a linen cloth (Artiukh 1977; Ziubrovskiy 2010).

Most often, the remains of the dough in the form of a spherical piece of the future mother-dough were stored directly in the trough between baking cycles. In Volyn the trough with remains of the dough during longer storage (for more than 2 weeks) was taken to a cool place, such as a pantry, and in Slobozhanshchyna they were stored in a cellar or in any other cold place. Since the spherical lump of the leaven was formed by scraping the remnants of the dough from the trough, it was sometimes called *poshkrabanets*, *shkrabanets* (Volyn), *poshkribtushka* or *poshkrebukha* (Western Polissia). In the Transcarpathian Boykivshchyna, where bread was baked less often, the leaven was wrapped in cloth and put into flour. The people also wrapped the dough residues after kneading into a cabbage leaf and further stored such wrapped leaven in the cellar. In order to prevent the leaven from covering with mildew and drying out during storage in the trough, it was sprinkled with salt or flour on the top, and the hop cones extract was used for sponge preparation. Although it is known that the leaven formed of the remains of the dough almost never spoiled.

6.3 *Recommendations for Ensuring of Proper Quality Bread Formation*

Ritual actions related to preparation of the starter, sponge, dough, and baking of bread included crossing over of the trough, dough piece, bread, and preliminary saying of the verbal formulas of the Christian and religious content, maintenance of cleanliness, silence in the room, the prohibition of slander.

The housewife engaged in baking, during her long practice, in addition to wisdom and knowledge from her mother, accumulated a significant empirical knowledge about the rules of dough and bread making, the required ratio of ingredients, especially liquid and flour, the influence of temperature conditions, inclusion of the other raw material components, additional operations etc.

It was fair to pay attention to the temperature of water during kneading, as it affected the quality of sponge fermentation. A liquid at room temperature (luke-warm liquid corresponding to the temperature of the human body) was considered optimal for the sponge preparation. Failure to comply with the traditional rules regarding the temperature of the soluble liquid caused negative consequences for the dough fermentation and corresponding deterioration in the quality of sourdough bread.

During fermentation of the sponge lasting from 6 to 12 h, the trough was placed near the oven, on the hearth, on a bench near the oven, or even on the bed. In order to provide the additional heat, Ukrainians covered the oven with warm clothes (like a casing) or laid the clothes under the trough, insulating it from the cold floor and retaining the heat released during fermentation. Pillows or duvets were sometimes used for thermal insulation.

In addition, it was forbidden to use hot water for kneading of the sponge, which led to formation of sticky bread crumbs and destruction of the microbiota of the inner surface of the trough. In the opinion of housewives, the sourdough from overheated trough did not work in the future. Hot water sterilized both sponge and all working surface of the trough, on the walls of which, covered with the remains of the dough, colonies of yeast and lactic acid bacteria settled as well. It was believed that various irrational actions could have the negative impact on the dough fermentation in the kneading trough. For example, in Volyn it was considered that the souldough in the trough would not work well if it was maleficated, if a cat jumped over the trough, if the housewife baked bread on Friday (Ternopil region) etc.

6.4 *Traditional dough fermentation Improvers and Hop Bread Making*

In the traditional bread making, Ukrainians used various ingredients of the plant and animal origin, improving the fermentation process. In order to accelerate and properly regulate the process of obtaining a sourdough and accumulation of the fermentation microflora, Ukrainian housewives used the following techniques:

1. creation of more balanced composition of the nutrient medium by steaming a part of the flour, its autolyze, additional inclusion of fermented milk products, whey, honey, sugar, boiled potatoes and beans;
2. introduction of previously prepared “homemade yeast” as a source of fermentation microflora, which could be different in various regions (“hopped yeast” – everywhere in Ukraine; “brewer’s yeast” of dried beer foam in the Western regions; “wine yeast” of wine foam and wort in the south of Ukraine);
3. use of ingredients with the selective antiseptic properties, i.e. active towards foreign microflora at the relative stability of yeasts and lactic acid bacteria (LAB) (extracts of hop, yarrow etc.) (Lebedenko & Kozhevnikova 2019; Lebedenko et al. 2017).

In spite of the fact that potatoes appeared in the territory of Ukraine only in the eighteenth century AD, they were actively grown already at the end of the nineteenth century AD. Since then, peasants use this vegetable crop in the traditional bread making. Most often, boiled potatoes were added to sponge as a filler or substitute for the flour. Beans were also used as a flour substitute, for example, in Volyn. Usage of these additives was especially relevant in the war and postwar periods. Boiled potatoes were used to adjust the consistency of erroneously steamed sponge which reduced the dilution of semi-finished product during fermentation. Boiled potatoes also allowed getting softer bread.

The traditional Ukrainian bread making was characterized by the use of various fermented milk products (sour milk, whey, residues after mechanical separation of sour cream). However, use of steamed milk to make dough was uncommon for Ukrainians; it was used only occasionally instead of water in making of sponge for wheat bread. In general, the use of fermented milk products contributed to rapid maturation of the sponge and increase of the dough during fermentation due to the presence of amino acids, minerals and addition of lactic acid, which facilitated reproduction of the microbiota. Sourdough bread made with the use of fermented milk products had better porosity and volume yield. For example, whey bread was considered tastier than bread made with water. Rather often, use of fermented milk products corrected low baking qualities of flour made of sprouted grain, as it inhibited the enzymes activated during sprouting and improved structural and mechanical properties of the dough.

Preparation of special “homemade yeast” was common in the traditional Ukrainian bread making. Throughout Ukraine, its main components were brews or mashes of hop cones, to which dried leaves of this plant, steamed grain bran, boiled potatoes and flour could be added. For making homemade yeast, various combinations of these substances were mixed with flour and water, and left for fermentation for 0.5–3 days. Enzymatically active homemade yeast was added to the sponge during kneading.

The process of making “homemade yeast” in Podillia Transnistria and Dnipro regions was rather complex. It was made of the fermented mixture of bran and flour in the hop extract, which were kneaded into a firm dough, to form a *palianytsa*. This sour dough for long-term storage was dried in the sun and received *pliatyok*, *maglai*, *grysyk*.

The technological process for production of the traditional Ukrainian sourdough bread using hop *grysyk* was divided into several stages such as: preparation of raw materials and auxiliary means; making of fermented bran; obtaining of hop *grysyk*; activation of hop *grysyk*; preparation of liquid sponge; dough making; dough processing; baking of dough pieces; bread cooling and storage (Fig. 18.7, Table 18.1).

At the preliminary stage, the flour was sieved, and firewood was prepared to fire the oven up. After that, fresh or pre-dried hop cones were poured with water and heated to boiling in a clay pot (Shcherban, 2016). Hop cones were boiled on the low heat during 10–15 min to release the extracting compounds. 2–3 tablespoons of sugar or honey were added to the obtained hop extract of brown color and cooled. The cooled solution was filtered through a cloth, and wheat or rye bran was added thereto in the amount required to form semi-finished product with the consistency of a thick sour cream. The resulting semi-finished product was left in the container not tightly closed for fermentation in a warm place, for example, in the hearth for one day. During this time, the semi-finished product was punched two or three times to evenly distribute the spontaneous microbiota and more efficiently feed microorganisms with available sugars that have accumulated due to the high enzymatic activity of the bran.

The next stage was obtaining of the hop *grysyk*. To do this, the fermented bran was ground with wheat or rye flour using *kopystka* in the wooden trough until bean-sized balls were formed. This semi-dry mixture was spread in a layer of 5–7 mm thick on the cloth and dried under indirect sunlight in summer or near the oven in winter. Obtained homemade yeast or hop *grysyk* was placed into linen bags, which were tied and stored suspended for a long time in a dry room, using as needed for breadmaking. Hop *grysyk* was used to prepare a sponge instead of mother-dough from the previous baking batch (Fig. 18.6).

It is known that in Poltava region *palianychka* bread, mixed with the fermented mixture of bran and flour in the hop extract, was baked in the oven to obtain *roz-kryshka*. Respectively, *grysyk* and *rozkryshka* had different enzymatic activity: most of microorganisms remained in *grysyk*, while *rozkryshka* served only as an additional nutrient substrate for yeast and lactic acid bacteria.

Then the bread was made using the sponge with activation of hop *grysyk*. For this purpose, it was poured with warm water in the ratio of 1:2–2.5 and kept in water for 2 h; after that, the linen bag was pressed out to transfer the soluble substances and microbiota of “homemade yeast” to the aqueous medium. Flour was added to the obtained activated liquid leaven of spontaneous fermentation, and the liquid sponge with the consistency of thick sour cream was kneaded. The sponge was left in a warm place to ferment for 1–1.5 h. After dropping of the sponge, salt, sugar or honey, as well as wheat flour, were added to it to knead the dough. The dough was kneaded by hand for a long time (sometimes up to 1 h). The resulting dough was subjected to fermentation, followed by dividing the dough into pieces and moulding round dough pieces. As the moulds, wicker baskets, clay plates, or cabbage leaves were used. After maturation in the mold, dough pieces were placed into preheated oven and baked for 1–1.5 h. Obtained products were cooled, and covered with a towel. Duration of consumption of such bread was about 1–1.5 weeks.

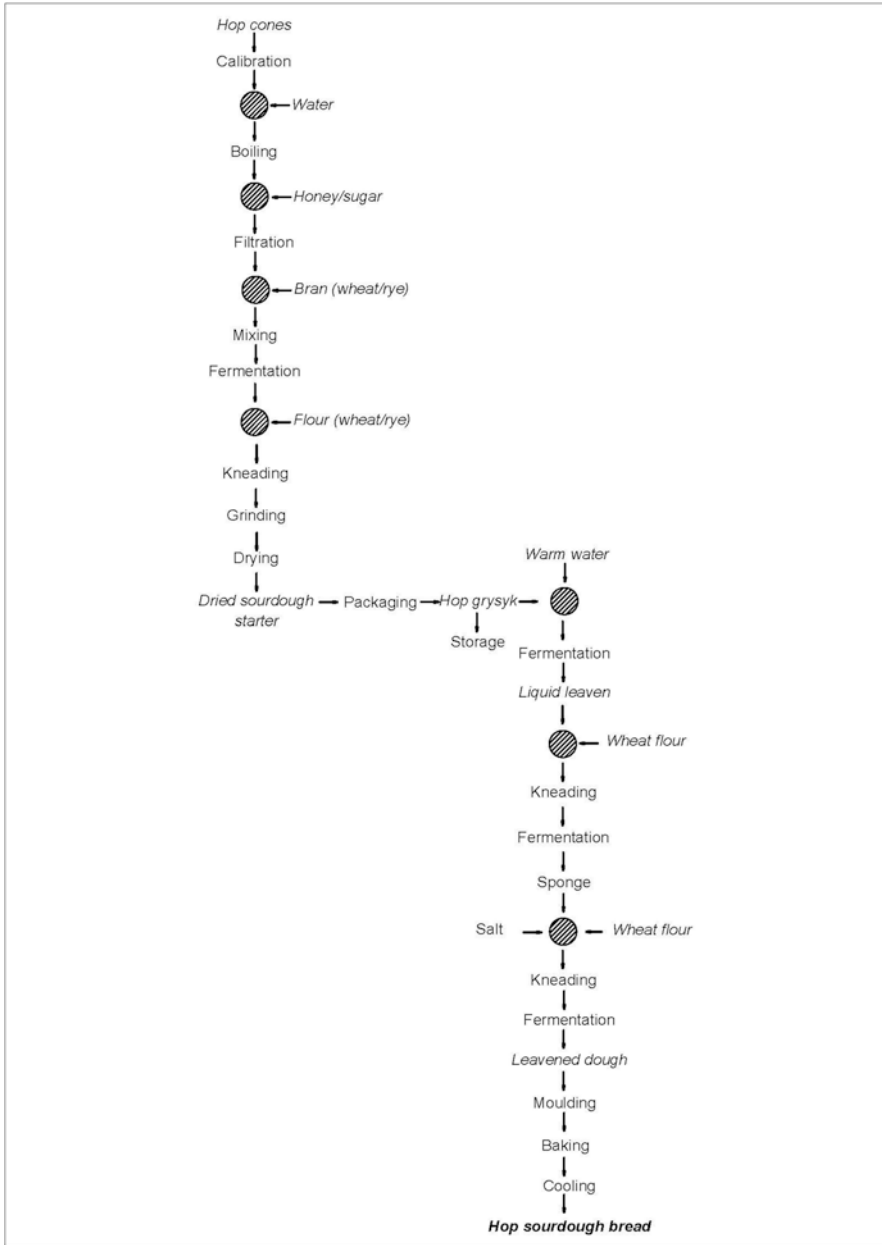


Fig. 18.7 Flowchart of the Ukrainian hop sourdough bread making

Table 18.1 Technological modes of hop sourdough bread making

Bread baking stage	Input raw materials and semi-products	Operation	Output product
Raw materials preparation	Flour	Sieving	Hop extract
	Water	Heating	
	Hop cones	Calibration	
		Extraction of hop cones at hydro-module of 1:100 by boiling for 10–15 min	
Preparation of fermented bran	Hop extract	Dissolution of sugar/honey in the hop extract	Fermented bran
	Sugar/honey		
	Wheat/rye bran	Kneading of the dough with the consistency of thick sour cream	
		Fermentation for 24 h with 2–3 punching operations	
Obtaining of hop <i>grysyk</i>	Fermented bran	Kneading of tight dough	Hop <i>grysyk</i> in the bag for storage
	Wheat/rye flour		
		Rubbing of the dough	
		Drying of the dough in a layer of 5–7 mm thick at the temperature of 30–40 °C to the moisture level of 11–13%	
	Packing in round linen bags of 12–13 cm in diameter		
Activation of hop <i>grysyk</i>	Hop <i>grysyk</i> in the bag	Keeping of hop <i>grysyk</i> in a bag in water at hydro- module of 1: 2–2.5 for 2 h	Liquid leaven
	Warm water		
		Pressing out of the linen bag	
Sponge making	Liquid leaven	Kneading of liquid sponge with the consistency of thick sour cream	Liquid sponge
	Wheat flour		
		Fermentation of the sponge for 1–1.5 h	
Dough making	Liquid sponge	Kneading of the dough for 1 h	Fermented dough
	Flour		
	Sugar /Honey		
	Salt		
	Fermentation of the dough for 1–1.5 h		
Dough processing	Fermented dough	Dividing the dough into pieces	Proofed dough pieces
		Molding the dough pieces	
		Proofing the dough pieces	
Baking of dough pieces	Proofed dough pieces	Baking in the oven at 220–280 °C for 1–1.5 h	Hot hop sourdough bread
Cooling and storage of bread	Hot hop sourdough bread	Cooling of bread	Hop sourdough bread
		Covering with a towel	
		Storage at room temperature for 1–1.5 weeks	

Hop was known as one of the most common improvers of sourdough fermentation in Ukraine (Artiukh 2014). Hop is a unique plant, due to chemical composition of hop cones. Hop contains vitamins C, E, B₁, B₃, B₆, H, PP, necessary for the activation of enzymes involved in the metabolism of yeast cells and fermentation at all. A significant part of the nitrogenous substances of hop is asparagine, which is an effective stimulant of yeast activity. Besides, hop is rich in macro- and microelements, required for the viability and development of yeast cells. Moreover, a complex of specific compounds is found in hop cones. Hop cone resins represent a mixture of phenols, resin acids and neutral resins, which includes more than 90 compounds, 20 of which are not found in other plants. Quantitative content of phenols and resin acids determines the marketable value of a specific hop variety. The main component of the bitter substances of hop is humulone (the carrier of its bitter taste), lupulone and their derivatives, which have the selective fungicidal and broad bactericidal action (Lebedenko & Kozhevnikova 2019). However, lactic acid bacteria and yeast are resistant to their impact. It allows hop extracts to stabilize the microbiological composition of spontaneous fermentation yeasts, inhibiting the development of pathogenic microorganisms (Lebedenko et al. 2014; Yurchak et al. 2009). In addition, hop extracts improve the biological value of bread, enriching it with polyphenolic compounds. The healing properties of hop are well known to Ukrainians: hops tinctures were used in folk medicine to treat colds, diseases of the genitourinary system, etc.

In bread making use of aromatic and fine-aromatic hop varieties is known to be more appropriate than bitter, brewer's ones. When using bitter hop with the high content of alpha acids, the bread acquires a bitter taste, especially with the introduction of crushed hop during the preparation of the sponge. For example, in Volyn dry mixture of hop leaves and bran was sometimes added directly to the sponge to improve the dough fermentation, but it significantly affected the taste of bread. However, in the traditional Ukrainian bread making, use of hop cones, rather than its leaves, was the most widespread. At the same time, a significant change in the taste of bread, its deterioration occurred only under short duration of fermentation of the dough made with hop extract. So, the use of hop cones at the initial stages of long-term bread making has a positive effect on the dough preparation, quality of the traditional Ukrainian sourdough bread and its nutritional value.

7 Conclusion

Ukrainian breadmaking traditions are the cultural heritage of the Ukrainian people growing grain from ancient times. Together with the Ukrainian towels' patterns, folklore and art, customs and way of life, they make up the genetic code of the Ukrainian ethnos, distinguishing it from other nations. Authentic technologies and local products represent an inexhaustible source of development of the modern food industry and models of healthy nutrition. It is an invaluable treasure, which should be deeply studied and reproduced in our times.

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