МИНИСТЕРСТВО ОБРАЗОВАНИЯ И НАУКИ РОССИЙСКОЙ ФЕДЕРАЦИИ

УНИВЕРСИТЕТ ИТМО

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АНГЛИЙСКИЙ ЯЗЫК
FOOD TECHNOLOGY

Учебное пособие

УНИВЕРСИТЕТ ИТМО

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Учебное пособие подготовлено для обучения английскому языку. Цель данного учебного пособия – подготовить студентов к чтению оригинальной литературы по специальности.

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Университет ИТМО – ведущий вуз России в области информационных и фотонных технологий, один из немногих российских вузов, получивших в 2009 году статус национального исследовательского университета. С 2013 года Университет ИТМО – участник программы повышения конкурентоспособности российских университетов среди ведущих мировых научно-образовательных центров, известной как проект «5 – 100». Цель Университета ИТМО – становление исследовательского университета мирового уровня, предпринимательского по типу, ориентированного на интернационализацию всех направлений деятельности.

ВВЕДЕНИЕ

Цель данного учебного пособия – подготовить студентов к чтению оригинальной литературы по специальности, а также развить и закрепить навыки аудирования, говорения и письма в сфере профессиональной коммуникации.

Настоящее издание предназначено для работы на занятиях с бакалаврами, магистрантами и аспирантами. Пособие состоит из трех разделов, в которые входят 19 уроков (Units). Каждый урок содержит словарь, текст, лексические и грамматические упражнения. Первые два раздела включают по шесть уроков, а третий раздел включает семь уроков. Каждый раздел заканчивается контрольным заданием, направленным на выявление остаточных знаний у студентов и закрепление пройденного материала. Контрольное задание состоит из трех частей: Comprehension, Speaking, Writing. Каждая часть включает в себя ряд упражнений, отвечающих современным стандартам обучения иностранному языку. Учебное пособие заканчивается приложением, которое содержит словарь трудной и специальной лексики, содержащейся в текстах и упражнениях пособия.

Тексты для уроков подобраны таким образом, чтобы по возможности дать представление о составе, технологии обработки и способах хранения различных пищевых продуктов, а также познакомить учащихся с основами хлебопечения и пивоварения.

Лексические упражнения построены так, чтобы студенты могли расширить словарный запас, активизировать уже имеющиеся знания, а также научиться морфологическому членению слов изучаемого языка.

Грамматические упражнения отражают все трудности, необходимые для правильного перевода технических текстов в рамках данного пособия и последующего самостоятельного чтения технической литературы. Цель данных упражнений – активизировать полученные ранее знания и закрепить их на конкретных примерах,

содержащих специальную лексику. Необходимо развить у студентов способности видеть грамматические конструкции в тексте и легко их переводить, а также привлечь внимание обучающихся к явлению многозначности и многофункциональности отдельных слов, словосочетаний, грамматических категорий, особым образом употребляемых в технической литературе.

При работе с данным пособием рекомендуется использовать следующие словари:

1. Англо-русский словарь по пищевой промышленности /Под ред. Л.П. Ковальской. – М.: Русский язык, 1988.

2. Мюллер В.К. Большой англо-русский словарь: в новой редакции. – М.: Цитадел-Трейд; Рипол классик, 2005.

3. Современный англо-русский политехнический словарь / Сост. В.В. Бутник. – М.: Вече, 2012.

4. Электронный словарь ABBYY Lingvo 12.

UNIT 1

affordable – доступный (по цене)
agriculture – земледелие, сельское хозяйство
appearance – внешний вид
composition – состав
digestible – перевариваемый
fishing – рыболовный промысел
food preservation – сохранение, консервирование пищевых продуктов
food processing – технология производства (обработки) пищевых продуктов
food process engineering – техника пищевых процессов
food science – наука о пищевых продуктах
involve – включать, вовлекать
nutritive value – питательная ценность
palatable – вкусный
poisoning – отравление
prevent – предотвращать, препятствовать
replace – заменять, замещать
safe – безвредный
safety – безвредность, безопасность
species – вид, разновидность
spoilage – порча
storage – хранение, хранилище
technique – метод, способ, технический прием
undesirable – нежелательный

OPTIMIZATION OF INDUSTRIAL FOOD PROCESSING

Everyday food in an industrialized society relies not only on agriculture, horticulture and fishing but also on efficient food processing. Since the origin of civilization man has always processed food, and the

basic purposes of food processing have remained unchanged. The first purpose is the conversion of agricultural produce into palatable attractive, digestible and safe foods. The second purpose is the preservation of foods for availability out of season, and for transportation to areas distant from agricultural producers. Now quality, safety and stability are in the foreground, the improvement of taste, appearance and nutritive value being also of great importance.

A wider range of attractive food products has become affordable through advances in food science, food technology and food process engineering together with the development of a wide range of highly efficient processing equipment and new synthetic packing materials. Many traditional processes have now been replaced by automated production methods and a lot of modern process control systems have been introduced.

Food process engineering is concerned, on the one hand, with the mechanical and physical operations involved in food processing and on the other hand – with machines and equipment in which physical, chemical and biological conversions in food materials are performed during processing.

Food science involves the study of all aspects of science related to food, food chemistry, biochemistry and microbiology being the most important ones. An understanding of the chemical nature and properties of food is essential if one is to achieve an understanding of the composition of food and the reactions which take place during its storage and processing. The biological changes occurring in the industrial processing of food are also of great importance. They must be carefully considered and analysed in addition to the chemical and physical changes.

Microbiology is the study of microorganisms. Some species of microorganisms are beneficial and are used extensively in food production. Other types are responsible for many undesirable effects in food, such as spoilage and poisoning. A knowledge of the nature of microorganisms, their growth requirements and how the growth can

be prevented is necessary if one wants to understand the principles involved in the various methods of food preservation.

Consequently, a food technologist must have a broad knowledge of scientific and engineering principles. He must be acquainted with the composition of food, its chemical nature, physical, chemical and biological changes, occurring in food, and also with basic equipment, operations and processes involved in the manufacture of any particular processed food.

EXERCISES

I. Word formation. Form nouns from the given words according to the patterns:

a) improve – improvement
advance – ?
govern – ?
require – ?
equip – ?

b) pack – packing
process – ?
poison – ?
manufacture – ?
perform – ?

c) operate – operation
relate – ?
promote – ?
solute – ?
prevent – ?

d) store – storage
spoil – ?
use – ?

II. You are sure to easily guess the meanings of the derivatives:

Verbs:	Nouns:	Adjectives :	Adverbs:
to consider	consideration	considerable	considerably
to effect	effect	effective	effectively
to synthesize	synthesis	synthetic	synthetically
to produce	production	productive	productively
productivity	producible		

product

producer

III. Why are these words placed here together:

a) careful, beneficial, physical, spiritual, industrial, essential, agricultural;

b) technology, technique, technological, technologist, technical, technician;

c) undesirable, unknown, uncommon, unusual.

What parts of speech may they be? Use them in the examples of your own.

IV. Translate into Russian:

food process engineering, horticulture, food science, composition of food, food preservation, undesirable effects, fising, spoilage, processing equipment, safe foods, agriculture, synthetic packing materials.

V. Translate into English:

производство пищевых продуктов, пищевая промышленность, современное высокопроизводительное оборудование, синтетические упаковочные материалы, питательная ценность, химические изменения, виды микроорганизмов.

VI. Translate the following sentences paying attention to the predicates in the PASSIVE VOICE:

1. The quality of foodstuffs is constantly being improved. 2. Industrial processing of food can be followed by physical, chemical and biological changes occurring in food materials. 3. Food technology is spoken of as scientific study of food and food preparathion. 4. Food spoilage may be caused by the action of microorganisms. 5. Microbiology is now being looked upon as one of the most important aspects of food science. 6. In the nearest future considerable growth of new synthetic packing materials production will be paid great attention to.

VII. Find MODAL VERBS and their equivalents in the following sentences and translate them:

1. It is known that many different reactions may take place during food processing. 2. One should realize that many relationships in food

processing cannot be derived theoretically, but have to be found out experimentally. 3. Food technologist ought to make use of a combination of experimental data, mathematical calculations and experience. 4. One can expect that in the future the role of food science will become more important. 5. While preparing foods in industrial scale storage time and conditions must be taken into account. 6. Various microorganisms are able to cause undesirable changes in food products.

UNIT 2

carbohydrate – углевод
constituent – составная часть, элемент
consume – потреблять
diet – питание, рацион питания
edible – съедобный
excessive – избыточный
fat – жир
flour – мука
furnish – снабжать, доставлять
intake – потребление, поглощение
lack – недостаток, нехватка
malnutrition – недостаточное, неправильное питание
mixture – смесь
nutrient – питательное вещество
nutritionist – диетолог
ozidise – окислять
property – свойство
protein – белок
substance – вещество
tissue – ткань
vehicle – средство перевозки (доставки)
waste products – отходы

COMPOSITION OF FOOD

Food is known to be necessary for any human being or any form of life. Food has three chief functions. First, it serves as fuel for the body, providing energy to support body activity; second, it furnishes the building material for formation, growth, maintenance and repair of body tissues; and third, it provides for the regulation of the body processes.

The word «food» is used to designate anything edible whether it is a natural product such as meat, eggs, milk, apples; a partially processed product such as flour, or cooked foods such as bread or cakes. But scientifically speaking, foods are not so much substances that we eat as substances that supply certain nutrients when eaten. That is why the nutritionists use the word «foodstuffs» for those portions of foods the body can use, mainly the proteins, fate and carbohydrates.

To be a highly qualified food engineer or food technologist one should be well acquainted with the composition of food, its properties and the utilization of food by the human body. As it was mentioned above, nearly all foods are mixtures of substances known as nutrients. Each nutrient has particular type of chemical composition and performs at least one specific function when it is digested and absorbed in the body.

The essential constituents of food can be classified into six groups: proeins, fats, carbohydrates, vitamins, minerals and water. Proteins, fats and carbohydrates are used for providing energy to support body activity. They are also required for formation, growth and replacement of tissues. Vitamins and mineral elements are necessary to regulate body processes, some of them being used for growth and replacement of tissues.

Water serves as a vehicle for transporting food and waste products. It assists in regulating body temperature and takes part in many chemical reactions.

A well balanced diet is necessary for the maintenance of good health. This means that the food a person consumes should be planned to provide adequate amounts of the essential nutrients together with an adequate, but not excessive, energy intake. If a diet is not balanced, malnutrition takes place. Malnutrition may be caused by a lack of one or more of the essential nutrients in the diet. About four dozen compounds and elements must be supplied daily by the diet. Certain of these are more widely distributed in nature and to a greater extent than others. The problem of selecting those foods which will insure a proper intake of all essentials is basically the responsibility of the nutritionist. The food technologist is responsible for the development of the processe which will

provide maximum retention of all the nutrients necessary to insure optimum healthfulness of the product.

EXERCISES

I. Find the suffixes in the following words. What parts of speech do they form? Translate the words, give other examples:

extremely, responsible, replacement, oxidize, mixture, regulate, variety, specific, childhood, numerous, classify, convenience, agricultural, spoilage.

II. How many suffixes are there in the word CAREFULLY?

III. Find the correct form of the word on the left so that it can be used on the right:

CHEMISTRY – Each nutrient has a particular type of_____composition.

ASSISTANT – Water _____ to regulate body temperature.

SELECT – The problem of _____ of foods insuring a proper intake of all the essential nutrients is paid great attention to.

IV. Form the verbs from the given nouns:

service – ? qualification –?

consumer – ? responsibility – ?

mixtur – ?

V. What is common in the following words:

sign – designate – design – signature – designer; respond – responsible – correspond – correspondence – correspondently; form – information, perform – formal – formality – deformation.

VI. Translate into Russian:

to support human body activity, body tissues formation, well-balanced diet, excessive energy intake, food and waste products, to insure optimum healthfulness.

VII. Translate into English:

функция роста, поставлять питательные вещества, пищевой продукт, переваривать пищу, белки, жиры, углеводы, замена тканей, регулирование температуры тела, неправильное питание, недостаток витаминов, обеспечивать достаточный рацион питания, ожирение.

VIII. Choose the necessary word and use it in the sentences:

nutrient, diet, activity

1. Food is necessary to support body _____

2. Vitamins and minerals in the _____ accomplish body process regulation functions.

3. The essential constituents being contained in foods are called _____

IX. Translate the following sentences paying attention to the functions of GERUND and PARTICIPLE II:

1. Protein in tissues is constantly being broken down and must be replaced from the amino acids supplied in the diet. 2. In recent years attention has been focused on the problem of developing lowcost protein rich foods either by making fuller use of local protein resources or by investigating new types, such as singlecell protein produced by microorganisms. 3. For example, 500 kg of yeasts, if grown in suitable conditions, can produce 50 tonnes of protein in one day. 4. Unless well-balanced, a diet will result in malnutrition. 5. If salted or dried, foods can be kept for a longer period of time. 6. An increase in the amounts of vegetables and fruits in the diet may have the effect of reducing the risk of developing several deseases. 7. The breaking down of some mineral compounds releases energy when required. 8. Meat and fish cannot be used by man until cooked. 9. A varied balanced diet will supply all the necessary vitamins in sufficient quantity.

UNIT 3

accomplish – выполнять, осуществлять
acid – кислота
adipose tissue – жировая ткань
amino acid – аминокислота
antibody – антитело
bean – боб, фасоль
bloodstream – кровообращение
cell – клетка
cereal – хлебный злак, зерно, крупа
contain – содержать
content – содержание
derive – происходить, получать
enzyme – фермент
fat-soluble vitamin – жирорастворимый витамин
fatty acid – жирная кислота
legume – боб, растение из семейства бобовых
nut – орех
obtain – получать
ripe – зрелый
seed – семя
solvent – растворитель
water-soluble – водорастворимый витамин

PROTEINS, FATS AND CARBOHYDRATES

Proteins, fats and carbohydrates are known to be the most essential nutrients in the diet. Proteins in human diet can be obtained from both animal and vegetable sources, the most important being meat, eggs, fish, cereals, legumes, seeds and nuts. In general, foods obtained from animals contain more protein than foods obtained from plants, although some vegetable materials such as soya beans have a high protein content.

Vegetable proteins have the advantage of being cheaper than animal proteins.

Proteins are complex organic substances, containing the elements: carbon, hydrogen and oxygen. All proteins also contain nitrogen and some contain sulphur and phosphorus. When foods are eaten the proteins are digested by hydrolytic enzymes and are absorbed into the bloodstream as amino acids. These amino acids are used in the synthesis of new proteins needed for energy, growth, maintenance and replacement of body cells, the latter occurring in all people at all stages of their life. Besides, protein is necessary for the formation of enzymes, antibodies and some hormones.

Fats are also the necessary component of living tissues and essential in human nutrition. They supply a major portion of man's energy, giving more than twice as much energy as proteins and carbohydrates. The natural foods which contribute the largest amounts of fats to our diet are the animal products – meat, dairy products, eggs, fish and seafood.

Fruits and vegetables contain little quantity of fat (between 0.1 and 1 per cent). But some of them are rich sources of fats. Thus, a ripe olive contains about 20 % of fat. Nuts are very rich in fat. Walnuts, for example, have about 64 % of fat.

Fats in the diet accomplish numerous functions. They are primary energy sources. Excess fat is stored in the adipose tissue where it has three functions: a) it constitutes an energy reserve; b) it forms an insulating layer under skin and maintain a constant body temperature; c) fat stored in the adipose tissue around delicate organs such as the kidneys protects them from physical damage. Fats are also solvents for the fat-soluble vitamins (A, D, E and K) that are introduced in the diet in the fatty portion of the food.

Carbohydrates are also of great importance for human nutrition. They supply a major portion of man's energy and are primary derived from plant materials, e.g. cereals, vegetables and fruits. These substances accomplish a number of functions in the body. They are oxydized in the cells, are broken down in a series of reactions and energy is released when

this takes place. Any excess of carbohydrates is converted into fat that is stored mainly in the liver and all over the body.

EXERCISES

I. Make up the missing forms of the words given below:

Verb:	Noun:	Adjective:
protect	?	?
react	?	?
prevent	?	?

II. What parts of speech are the words with the suffix – AGE:

store – storage; spoil – spoilage; use – usage.

III. Why are these words placed here together?

circumstance, importance, assurance, substance, abundance.

Translate them into Russian.

IV. Find the synonyms among the following words:

supply, accomplish, maintain, select, transform, realize, help, alterate, support, take place, employ, keep, embrace, contribute, choose, assist, convert, understand, use, perform, include, occur, contain, change.

V. Choose the necessary word and insert it into the sentence:

obtain, maintain, contain.

1. Excess fat stored in the adipose tissue assists to ___ a constant body temperature. 2. Carbohydrates are primarily _____ from plant materials. 3. Some vegetables and cereals_____ large amounts of protein.

VI. Translate into Russian:

animal and plant protein sources, high protein content, to contain carbon, hydrogen and ozygen, excess fat, to contribute a certain amount of nutrients to one's diet; adipose tissue, insulating fat layer, to oxydize.

VII. Translate into English:

иметь преимущество, превращаться, выделять энергию, всасываться в кровь, соевые бобы, сложные органические вещества, азот, сера, фосфор, ферменты, молочные продукты, почки, печень.

VIII. Mind the forms and functions of PARTICIPLE I. Translate the following sentences:

1. The biological changes occurring in the industrial processing of food are of great importance. 2. Having been canned, meat can be stored for some years. 3. Food industry output is constantly growing. 4. Food serves as fuel for the body providing energy to support body activity. 5. The soya beans having a particularly high protein content are becoming an increasingly important food product. 6. Potatoes are the most important source of vitamin C, as well as being a good source of some B vitamins. 7. At the beginning of the food industry food processes being based on experience and traditions were rather simple. 8. Vegetables and fruits are characterized by a high moisture content ranging from 75 to 95 per cent. 9. Having been discovered, the vitamins were named according to the letters of the alphabet.

IX. Remember the translation of NAPC. Find in the text all sentences with this construction. Translate some more sentences containing NAPCs:

1. Traditional empirical methods being no longer adequate, the food industry requires advanced techniques. 2. Over half of the world's population is suffering from malnutrition, protein defficiency being the most serious type of malnutrition. 3. Food science is very young, its rapid development starting only 70 years ago. 4. The temperature of fats being increased, some changes take place in them. 5. Fruit drying has only limited application, canning in syrups being extensively practiced.

UNIT 4

chlorine – хлор
compound – соединение
disperse – диспергировать, рассеивать(ся)
dissolve – растворять(ся)
fluorine – фтор
iodine – йод
liver – печень
magnesium – магний
manganese – марганец
metabolism – обмен веществ
potassium – калий
require – требовать
satisfy – удовлетворять
sodium – натрий
solubility – растворимость
store – запасать, хранить
sulphur – сера
take out – выводить
trace – незначительное количество
trace element – микроэлемент

VITAMINS, MINERALS AND WATER

The vitamins are a group of organic compounds, differing greatly in chemical composition, which play essential catalytic role in the normal metabolism of other nutrients. They cannot be synthesized by the body and have to be obtained from diet. Because their role is primarily catalytic in contrast to the protein, fat and carbohydrate, vitamins are required in relatively small quantities. They are found in varying quantities in a wide variety of foods, but no single food is likely to contain them all

in sufficient quantities to satisfy human requirements under normal conditions of food intake.

Traditionally the vitamins have been divided into two gtroups on the basis of their solubility characteristics: fat-soluble vitamins and water-soluble vitamins. Fat-soluble vitamins (A, D, B and K) are absorbed along with dietary fat. They dissolve in fats and tend to be stored in the body (in the liver), a person having these reserves being not absolutely dependent on their day-to-day supply in diet. In contrast, water-soluble vitamins (B and C) are not normally stored in appreciable amount in the body and any excess is taken out.

All forms of living matter are known to require many minerals for their life processes. Virtually all the elements of the Periodic Table have been found in living cells. The mineral elements are present in food mostly in the form of inorganic salts, e.g. sodium chloride, some are present in organic compounds, e.g. sulphur and phosphorus are constituents of many proteins. Milk and milk products, fish, eggs, vegetables and fruit prove to be the most important sources of minerals in the human diet.

Minerals account for approximately 4 % of body weight. From nutritional point of view calcium, sodium, phosphorus, potassium, magnesium, chlorine and sulphur are the most important mineral elements being required in relatively large amounts. Some elements such as iron, copper, manganese, zink, iodine, fluorine are necessary in trace amounts.

Minerals in human nutrition are involved in the control of body fluids, in in chemical reactions and in the building of rigid structures to support the body. For example, calcium and phosphorus are used in the formation of bones and teeth. Sodium, potassium, magnesium serve purposes of controlling body fluids. Many elements act alone or in conjunction with others as catalysts for essential enzymic processes in the body.

Water accounts for half of total body weight and without it the body cannot function and survive. Water is essential for it provides a medium in which nutrients, enzymes and other chemical substances can be dispersed and in which the chemical reactions necessary for maintaining

life can take place. It is also necessary as a means of transport within the body. Nutrients are carried to cells and waste products are transported from cells by blood plasma which is 90 % water.

It is possible for the human body to exist for several weeks without food, but it can only survive a few days without water. Water is taken into the body not only in foods and drinks, but it is formed also within the body by chemical reactions. When nutrients are oxydized in the cell in order to release energy, carbon dioxide and water are formed.

EXERCISES

I. Remember the words of the same root. Translate them into Russian:

structure – destruction – construct – construction – constructor – constructively;

soluble – dissolve – solution – solve – solvent – solubility;

relate – relation – relative – relatively – correlate – correlation;

oxidise – oxidation – oxide – dioxide.

II. Form the verbs from the given nouns and adjectives and translate them into Russian:

class – ? pure – ?

quality – ? specific – ?

III. Find the correct form of the word on the left so that it can be used on the right:

FORM Calcium and phosphorus are used in the ____ of bones and teeth.

DISPERSE Water provides a medium where nutrients, enzymes and other chemical substances can be ____ .

ABSOLUTE A man having vitamins reserves is not ____ dependent on their day-to-day supply in the diet.

IV. What helps you to define the part of speech of the following words?

satisfy, controlling, freshness, primarily, absorbed, digestion, desirable, similarity, empirical, greater, enzymic, requirement, chemical, largest, moisture.

V. Translate into Russian:

to play essential catalytic role, metabolism, wide variety of foods, to satisfy human vitamins requirements, fat-soluble and water-soluble vitamins, day-to-day supply, appreciable amount, living matter, total body weight, daily water requirement.

VI. Translate into English:

химический состав, относительно небольшое количество, растворяться, органические соединения, составная часть, запасать, точка зрения, микроэлементы, удовлетворять потребности человека, углекислый газ, формирование костей и зубов

VII. Define forms and functions of the INFINITIVE. Translate the following sentences:

1. In the nineteenth century it was assumed that a diet containing carbohydrate, fat, protein and minerals was sufficient to maintain health. 2. It was found that salting and drying helped to preserve meat and fish. 3. To regulate body processes is one of the chief functions of vitamins. 4. To insure the maximum retention of the natural healthful properties of the foods it is necessary to know the composition of foods and understand physical, chemical and biological changes occurring in their composition and properties during processing and storage. 5. It has been stated that nutrients to be carried to cells are transported by blood plasma which is 90 % water. 6. One has to realize that the main purpose is to ensure a rapid increase in the manufacture of food products. 7. Fat-soluble vitamins tend to be stored in the body. 8. To grow the body has to be supplied with sufficient food.

VIII. Find INFINITIVE CONSTRUCTIONS in the following sentences and translate them:

1. An excess of sugar in the diet has been shown to be one of the factors responsible for teeth decay and obesity. 2. For the body to grow different organic materials are to be provided. 3. We know carbohydrates to be the cheapest form of calories and supply the bulk of calories. 4. Hardworking man is likely to require more calories per day. 5. Two hundred years ago the scientists demonstrated scurvy to be prevented by the consumption of fresh fruit and vegetables. 6. The total protein requirement is sure to depend upon the nutritional value of protein fed. 7. Yeasts are known to be widely used in bakery products. 8. For food to be in abundance it is necessary to preserve it from spoilage.

UNIT 5

acidity – кислотность
aerobic bacterium – аэробная бактерия
anaerobic bacterium – анаэробная бактерия
browning – побурение, потемнение
can – консервировать
canning – консервирование
catalyst – катализатор
cause – вызывать, быть причиной, заставлять
cold storage – холодильное хранение
delay – задерживать, препятствовать
deterioration – ухудшение (качества), порча
drying – сушка
exclude – исключать
evaporate – испарять(ся)
flavor – вкус
freezing – замораживание
hurdle technology – барьерная технология
irradiation – облучение
magnetic – магнитный
mold – плесень
oscillating – колебательный, вибрирующий
pasteurization – пастеризация
pathogenic bacterium – патогенная (болезнетворная) бактерия
pickle – мариновать
pulsed – импульсный
retard – задерживать, замедлять
smell – запах
spoilage – порча
sugar – сахар
susceptible – восприимчивый, чувствительный
texture – строение, структура

vinegar – уксус
yeast – дрожжи

FOOD PRESERVATION

All food is known to be of organic origin and is susceptible to deterioration or spoilage which can be caused by changes of biochemical (enzymic) or biological nature. In the first case the cellular breakdown is caused by enzymes contained within the food itself which can be characterized as powerful catalysts taking part in different chemical processes occuring in living organisms. The browning of plant tissue, production of unnatural flavours, the fat oxidation in butter and oils are examples of unwanted enzymic changes. In the second case deterioration is caused by microorganisms such as bacteria, yeasts and molds. These organisms break down the complex organic components of the food into simpler compounds and so cause alterations in flavour, texture, colour and smell of the food.

To prevent various undesired changes food must be preserved. Food preservation consists in the use of several methods or combining of methods also known as hurdle technology. For example, it can be pasteurization or canning for milk and fruit juices, drying for cereals and flours, cold storage or freezing for fruits, and either drying, freezing or canning for meat and fish.

Prevention of food spoilage caused by microorganisms can be achieved by removing one or more of the conditions necessary for their growth. The following food preservation methods are currently used for these purposes: removal of moisture, lowering or raising the temperature, exclusion of oxygen, altering acidity (pH), chemicals and nonthermal methods such as irradiation, oscillating magnetic fields, high-intensity pulsed electric fields, high hydrostatic pressure and hudle technology.

In the commercial production removal of water (dehydration) can be achieved by applying heat and causing the water present in the food to evaporate. The addition of salt or sugar to the food has the same affect.

Microbial growth may be prevented by either decreasing or increasing the temperature. There are two types of low temperature preservation: refrigeration or chilling and deep freezing. In the first case the food is stored at a temperature in the range of 0–5 °C. The growth of most species of microorganisms is retarded, some of them being killed. However, many species are still able to grow slowly at these temperatures and bacterial spores survive. Then the food is frozen. If it is to be kept for a long period of time (e.g. longer than 3 months) it is stored at –18 °C or below. The freezing process has a killing effect and bacteria continue to die during storage.

It is possible to destroy microorganisms by holding the food at a high temperature for a definite period of time. The higher the temperature, the shorter the time necessary to reduce the number of microorganisms. The complete destruction of microorganisms by heat is known as sterilization. But some foods cannot be sterilized without altering their flavour. A good example is milk. Such products may be heated just enough to destroy the pathogenic bacteria that may be present. This is called pasteurization.

The exclusion of oxygen prevents the growth of molds and aerobic bacteria, but yeasts and many anaerobic pathogenic bacteria can survive in such conditions. Therefore, this method may only be used in combination with other methods, e.g. destruction by heat in canning.

The acidity (pH) may be lowered so that the food becomes too acidic to allow microorganisms to grow. The most common method is the use of vinegar in pickling. Chemical preservatives are also helpful in food preservation, sugar, salt and acids being widely used for this purpose. They do not kill microorganisms but they retard growth and delay food spoilage.

EXERCISES

I. What is the pronunciation of the letter – Y in the following words and what parts of speech are these words?

dry, mainly, safety, antiquity, occupy, widely, acidity, satisfy, apply, digestibility, supply, readily, destroy, delay.

II. What is the meaning of the prefix UN-?

undesirable, unwanted, unnatural, unavailable.

III. Form nouns with the suffix -ITY from the following words:

(e.g. stable – stability)

pure, acceptible, similar, antique, vary, continue.

IV. Give antonyms to the following words:

living – ? to lower – ? to continue – ? organic – ? to evaporate – ?

to heat – ? complex – ? to decrease – ? common – ? advantage – ?

to lose – ?

V. Translate into Russian:

organic nature, unwanted enzymic changes, food preservation, pasteurization, canning, removal of moisture, exclusion of oxygen, irradiation, bacterial spores, killing effect, vinegar, chemical preservatives, oscillating magnetic field, high-intensity pulsed electric field.

VI. Translate into English:

продукт, подверженный порче, распад клеток, дрожжи, плесень, вызывать изменения вкуса и запаха, предотвращать порчу продуктов, сушка, замораживание, изменение кислотности, задерживать рост микроорганизмов, полное уничтожение болезнетворных бактерий, барьерная технология, высокое гидростатическое давление.

VII. Translate the sentences paying attention to the CLAUSES OF PROPORTION:

1. It is obvious that the lower the temperature, the slower the deterioration of foods. 2. Losses of water soluble vitamins are known to become greater, the longer the period of their cooking. 3. Microorganisms growth becomes less, the higher the acidity of the food. 4. The fresher the vegetables and fruits, the more vitamins they contain. 5. The harder a man

works, the more energy is required to him and the more food must be consumed.

VIII. Find all the non-finite forms of the verb (VERBALS). Translate the following sentences into Russian:

1. Since the vitamins of the B group are water-soluble, they are not stored in the body, any excess being removed from the organism. 2. Unless protected against moisture cereal grains will mold. 3. The amount of iron absorbed appears to depend on the need of the body for this element. 4. One should know the vitamins to be complex organic compounds required in small quantities by the body for the maintenance of health. 5. The composition of most plant proteins is found to be less satisfactory than most proteins of animal origin. 6. Raw milk contains a little vitamin C, some of this being still retained after pasteurization. 7. Pasteur's being one of the earliest investigators of the connection between microorganisms and certain diseases of man, animals and plants is a well-known fact. 8. The scientific principles of technology having been applied, marked advance in the science of food technology resulted. 9. Enzymes being complex organic substances can be characterized as powerful catalysts taking part in different chemical processes occuring in living organisms. 10. Bread is certain to be an important source of protein, calcium, iron and B vitamins.

UNIT 6

current – электрический ток

denaturation – денатурация

heat-resistant – теплостойкий

high-temperature-short-time (HTST) method – высокотемпературный кратковременный метод

holding method – метод выдержки, способ длительной пастеризации

low-temperature-long-time LTH) method – низкотемпературный долговременный метод

rigorous – строгий (о режиме процесса)

spore – спора

steam – пар

sterilization – стерилизация

survive – выжить, продолжать существовать

ultra-high-temperature (UHT) method – метод пастеризации при очень высокой температуре

PRESERVATION BY USE OF HIGH TEMPERATURES

The killing of microorganisms by heat is supposed to be due to denaturation of the proteins and especially to the inactivation of enzymes required for metaholism. The heat treatment necessary to kill organisms or their spores varies with the kind of organism to be destroyed, its state, and the environment during heating. Depending upon the heat treatment employed only part of microorganisms, most or all of them may be killed. The temperature selected and the time used in heat processing will also depend upon other preservative methods to be employed and the effect of heat on the food. The greater the heat treatment, the more organisms will be destroyed, up to the heating that will produce sterility of the product. In pasteurization, for example, most of the spoilage organisms are killed but others survive and must be inhibited by low temperatures or some other

preservative methods, if spoilage is to be prevented. The various degrees of heating used on foods may be classified as pasteurization and sterilization.

Pasteurization is known to be a heat treatment that destroys part but not all of the microorganisms and usually involves the application of temperatures below 100 °C. The heating may be effected by means of steam, hot water, dry heat, or electric currents, the products being cooled promptly after the heat treatment. Pasteurization is used when more rigorous heat treatment may harm the quality of the product, or when one aim is to kill only pathogenic bacteria, or when the main spoilage organisms are not very heat-resistant, like the yeasts in fruit juices, or when any surviving spoilage organisms will be taken care of by additional preservative methods to be employed.

Time and temperatures used in pasteurising process are sure to depend upon the method employed and the product treated. The high-temperature-short-time (HTST) method employs a comparatively high temperature for a short time, whereas the low-temperature-long-time or holding (LTH) method uses a lower temperature for a longer time. For example, the heat treatment of milk at some 64 °C for 30 minutes is the holding method and at about 72 °C for at least 15 seconds is the HTST method. Beer may be pasteurized at 60 °C or above, the time varying with the temperature. The pasteurizing treatment given to fruit juices depends upon their acidity and whether they are in bulk or in a bottle or a can.

Sterilization means the destruction of all microorganisms involving heating for a longer time or at a higher temperature than is necessary for pasteurization. The ultra-high-temperature (UHT) range begins at around 88–100 °C and may extend to 150 °C or above, exposure times may be anywhere from 1 second to some seconds. UHT is employed mainly in milk processing.

EXERCISES

I. Mind the words of the same root:

sterile – sterilize – sterility – sterilization – sterilizing – sterilized – sterilizer; preserve – preservation – preservative; Pasteur – pasteurize – pasteurization – pasteurizer – pasteurized.

II. Give synonyms to the following words:

to alter – ?, to effect – ?, to employ – ?, to distruct – ?, to obtain– ?, to treat – ?

III. Remember the names of the methods of heat treatment:

high-temeperature-short-time method, holding method, low-temperature-long-time method, ultra-high-temperature process.

IV. Translate into English:

продолжать существовать, предотвращать, подавлять, вредить, денатурирование белков, обмен веществ, болезнетворные бактерии, порча, тепловая обработка молока, дрожжи, инактивация ферментов, время выдержки.

V. Define the type of CLAUSES OF CONDITION. Translate the sentences:

1. Work does not raise protein requirements provided the whole caloric need is met. 2. Had the diet been low in carbohydrates, a higher percentage of protein than usual would have been used to provide energy. 3. Unless the growth of microorganisms were retarded, the foods could not be stored for some months. 4. If the food is to be kept for a long period of time, it is stored at –18 °C or below. 5. Provided a diet were not balanced malnutrition would take place. 6. A knowledge of the nature of microorganisms and how their growth can be prevented is necessary if one wants to understand the principles involved in the various methods of food preservation. 7. But for the mechanical refrigeration, the problem of food products would not have been solved.

VI. Pay attention to the proper translation of the words: TO CAUSE, CAUSE, BECAUSE, BECAUSE OF:

1. Nuts and seeds can be considered together because of the general similarity of their composition and use. 2. The ordinary types of food spoilage are caused by changes of a biological or chemical nature. 3. Vitamins are required in relatively small quantities, because their role is primarily catalytic in contrast to the protein, fat and carbohydrate. 4. Butterfat is an ideal fat for human consumption because of its digestibility. 5. The effects of vitamin deficiencies had been recognized for centuries, but the cause of these deseases was unknown. 6. Some deseases may be caused by a lack of one or more of the essential nutrients in the diet.

LANGUAGE PRACTICE UNITS 1–6

Comprehension:

Revise texts 1–6 and answer the following questions:

1. How many branches does the modern food industry embrace?
2. Why is food necessary for any human being?
3. Can you name the most important sources of proteins, fats and carbohydrates?
4. What role do the vitamins and minerals play in human diet?
5. Why is food susceptible to deterioration?
6. Why is heat treatment widely used in food industry?

Speaking:

Choose a topic and make a short presentation:

1. Composition and functions of food.
2. Causes of food spoilage.
3. Pasteurization and sterilization.

Speaking tips:

– Give clear examples.
– Make your notes as short as possible.
– Speak from memory – don’t read.

Writing

Write a short composition on the topic «Food preservation methods».

UNIT 7

blast freezing – замораживание в интенсивном потоке воздуха
carbon dioxide – углекислый газ
chilled storage – хранение в охлажденном состоянии
cold storage – холодильное хранение
defrost – размораживать
extract – экстрагировать, извлекать
fluidized bed freezing – замораживание в псевдоожиженном слое
humidity – влажность
immersion freezing – замораживание погружением в жидкую холодную среду
intercellular – межклеточный
irreversibility – необратимость
mesh – сетка
odor – запах
perishable – скоропортящийся
plate freezing – контактное замораживание
precipitation – осаждение
relative humidity – относительная влажность
remove – отводить, удалять
stale – затхлый

PRESERVATION BY USE OF LOW TEMPERATURES

Low temperatures are used to retard chemical reactions and action of food enzymes and also to slow down or stop growth of microorganisms in food. The lower the temperature, the slower will be chemical reactions, enzyme action and microbial growth.

Any raw plant or animal food is sure to contain a variety of bacteria, yeasts and molds, which being in good conditions for growth can bring about undesirable changes in the food. Each microorganism present

has an optimal or best temperature for growth and minimal temperature below which it cannot multiply. The temperature dropping from this optimal one toward the minimal, the rate of growth of the microorganism decreases and is the slowest at the minimal temperature.

The term «cold storage» (or «chilled storage») can be applied to any reduction in the normal temperature of food, but it is mainly referred to the use of temperatures at or above 0 °C. The temperature used depends on the nature of the product and the storage atmosphere. Bananas, for example, are stored best at 15 °C, whereas meat is stored at 1 to 2 °C. This method usually involves cooling by ice or by mechanical refrigeration. It may be used as the main preservative method for foods or for temporary preservation until some other preservative process is applied.

Factors to be considered in connection with chilling storage include the temperature of chilling, the relative humidity, air velocity and composition of the atmosphere in the storage room. The chilling temperature is selected on the basis of the kind of food and the time and conditions of storage. The temperature of a refrigerator is mechanically controlled but varies in different parts usually between 0 °C and 10 °C. The optimal relative humidity of the atmosphere in chilling storage varies with the food stored and with environmental factors such as temperature and composition of the atmosphere. For example, if the level of carbon dioxide in the air is increased the rate of spoilage is reduced. The optimal concentration of carbon dioxide depends on the food stored. Ventilation or control of air velocities of the storage room is important in maintaining a uniform relative humidity throughout the room, in removing odors, and in preventing the development of stale odors and flavors.

The term «frozen storage» is certain to be more obvious. The product is stored in a frozen state but the exact temperature could depend upon the product itself. Most commercial storage freezers are at or below –18 °C. The freezing process itself involves two methods of microorganisms' growth control – slow freezing and quick freezing. In the first case, most ice crystals are formed in the intercellular spaces of tissues.

That is, freezing gradually extracts water from cells producing precipitation of proteins, concentration of salts and a partial destruction of the cell walls. All these result in dehydration, denaturation of proteins and irreversibility of cell absorption upon defrosting.

Quick-freezing processes in which the food passes through the range of maximum ice-crystal formation in 30 minutes or less are preferable, since the the small ice crystals formed by such a process do not disrupt the texture of the food. There are four main methods of freezing:

Plate freezing. In this method the refrigerant passes through a number of hollow plates, the food being placed between the plates. The latter may be moved up and down to make better contact with the food.

Immersion freezing. In this method the food is placed directly into the refrigerant. The refrigerant used depends on the food being frozen.

Blast freezing. In this method a blast of very cold air is blown directly onto the food.

Fluidized bed freezing. This method is very successful for freezing foods that are of small particle size, such as peas. It is an adaptation of blast freezing in which the air is blown upward through a mesh over which the food is passing.

EXERCISES

I. Try to form the antonyms for the following words, using the negative prefixes:

available, hydration, reversibility, edible, activation, desirable, to increase, to frost.

(Key: DE-, UN-, IR-, IN-)

II. Find a synonym for the underlined words:

to slow down the microbial growth;

temperature drop;

to influence food preservation;

the composition of the atmosphere.

III. Do you know any Russian words derived from the same roots? Explain their meanings:

plant, to contain, condition, to multiply, to prevent, to favor, odor.

IV. Translate into Russian:

precipitation, odor, uniform relative humidity, flavor, carbon dioxide, irreversibility, cell absorbtion, plate freezing, immersion freezing, blast freezing, fluidized bed freezing.

V. Translate into English:

разрушать структуру продукта, межклеточное пространство, образование кристаллов льда, процесс замораживания, ферменты, денатурация белков, состав атмосферы, скоропортящийся продукт, холодильное хранение, нежелательные изменения.

VI. Remember the meanings and functions of the word SINCE. Translate the sentences:

1. The number of foodstuffs that have come on the market since the turn of the century has greatly increased. 2. Since phosphorus occurs in all living cells it is found in most foods. 3. Some ordinary methods of food preparation such as cooking and baking were known many centuries ago and they are used since. 4. Since there is a wide variation in the structure of proteins, their properties also vary a great deal. 5. The body loses about 15 litres of water daily, since it is necessary to get rid of toxic waste products. 6. Since 1900 the food industry has greatly developed. 7. Since the packs insulate the products, efficient precooling before packaging is important.

VII. Remember the translation of the verb TO BE. Find examples in the text. Translate the following sentences:

1. The main purpose is to increase the manufacture of food products and to improve their quality. 2. Mechanical operations involved in food preparation are seldom accompanied by chemical changes in food materials. 3. The quality of foodstuffs is an extremely complicated subject.

4. To increase the manufacture of food products food industry was to be supplied with highly efficient equipment. 5. Varieties of foods are to be considered from the point of view of their suitability for processing. 6. Most fish to be frozen is initially cooled by immersion in chilled water or an ice/water mixture. 7. There is growing interest in the use of controlled atmosphere packs to extend the chilled storage and shelf-life of meat products. 8. Modern food industry is being characterised by enormous advances and improvements.

UNIT 8

aggravate – ухудшать, усиливать

facilities – средства, устройства, приспособления, оборудование

harvest – урожай; убирать урожай

indication – показание (прибора)

indicator – индикатор, датчик, указатель, счетчик

milking – доение

organoleptic – органолептический

packaging – упаковка, упаковывание

pattern – образец, форма

recorder – записывающее устройство, индикатор

retail – розничная продажа

retail display – выставка товара, витрина

slaughter – убой (скота)

tool – инструмент

wholesome – полезный

wilting – увядание

THE COLD CHAIN

The development and modernisation of food processing, storage, transportation and distribution cannot take place without refrigeration and freezing, because these processes play a decisive role in optimal preservation of perishable foods and provide consumers with safe, wholesome products. They help to preserve the original properties of foodstuffs of animal and plant origin, e.g to extend their storage life and maintain their freshness.

The protective action of refrigeration or freezing lasts only as long as they are applied. It is therefore necessary to keep products refrigerated or frozen from production to consumption, i.e. refrigeration or freezing should be permanent. This continuity of the processes is commonly known

as the «cold chain», which is defined as the means successively employed to ensure the refrigerated or frozen preservation of perishable foodstuffs from the production to the consumption stage.

If a break in cold chain occurs, the consequences may take various forms from early wilting of foodstuffs of plant origin, particularly vegetables, to the development of spoilage flora or, even worse, of pathogenic flora or toxins which may cause various deseases. For example, some bacteria are known to divide every 20 minutes under optimal conditions. Therefore, within 8 hours under optimal conditions one bacterium will have generated over 16 million bacteria.

In many countries cold chain is applied to over half the food consumed, because foods do not often come from a single country but are a combination of raw materials coming from several countries and different production systems. Increasing demand for long-life fresh products generates new risks. These risks are aggravated by mass consumption and new consumption patterns, e.g. fast food, shorter cooking times used in order to maintain organoleptic properties, microwave cooking. The risks can be restricted if the cold chain is controlled properly.

First of all, it is temperature control that should be improved throughout the cold chain, i.e. at any stage between harvesting, slaughter or milking and consumption, such as processing, packaging, storage, transportation, distribution, retail display, and use by the consumer. Special tools that provide a good indication of how well refrigeration equipment is operaing and maintaining the necessary temperature include various temperature recorders and indicators used in refrigerated storage facilities and vehicles, thermometers in small cold rooms, display cabinets and domestic refrigerators and time-temperature integrators. Extensive use of these tools helps to improve cold chains from the producer to the consumer, leading to higher food quality.

EXERCISES

I. Try to derive the meanings of the words formed from the same roots:

a) consume – consumer – consumption – consuming – assume – assumption – assuming;

b) contribute – contribution – distribution – attribute – attributive

II. Mind the pronunciation of abbreviations in English:

e.g – Latin: exempli gratia – English: for example – Russian: например

i.e. – Latin: id est – English: that is – Russian: то есть

etc. – Latin: et cetera – English: etc. – Russian: и так далее

III. Words of Latin origin are known to form plural in a special way typical of the language of origin. Remember some of them:

Singular:	Plural:	Singular:	Plural:
bacterium	– bacteria	criterion	– criteria
datum	– data	formula	– formulae
medium	– media	fungus	– fungi

IV. Define the type of SUBORDINATE CLAUSES and translate them:

1. Perishable foodstuffs shoul be refrigerated or frozen before spoilage flora is developed. 2. Although proper nutrition requires proteins, fats and carbohydrates, small amount of minerals and vitamins are also necessary. 3. Water is essential to nutrition, for water solutions carry nutrients through the body. 4. As it was mentioned above, obtaining adequate foodstuffs is greatly dependent on food technology and food science. 5. An understanding of the chemical nature of food is essential,

if one wants to understand the reactions which take place during its processing and storage. 6. The energy that foods can provide determines the quantity of food that is required by the body. 7. All vitamins play an important role in body chemistry, as the lack of any will lead to desease.

V. Pay attention to the proper translation of TO MEAN, MEANS, BY MEANS OF, MEANING:

1. To preserve foods means to prevent them from spoilage and poisoning. 2. Water is necessary as a means of transporting food and waste products within the body. 3. What is the meaning of «nutrient»? 4. There are several methods of food preservation, refrigeration being the only effective means for many foods. 5. The regulation of body processes was found to be accomplished by means of vitamins and mineral elements. 6. The mean temperature of preserving fruits can be taken from the special table.

UNIT 9

alter – изменять, менять
alteration – изменение, перестройка
aseptic feeling – асептический розлив
batch process – периодический процесс
blanch – бланшировать
buckle – вспучиваться
bulk – масса, объем
continuous process – непрерывный процесс
exhaust – выпускать, откачивать, эксгаустировать
exhaust box – эксгаустер
expose – подвергать воздействию
grade – сортировать, классифицировать
immerse – погружать
leakage – утечка
lid – крышка
overcook – переварить, пережарить
rust – ржавчина; ржаветь
seal – закатывать, запечатывать, закупоривать
solder – припой
vent-hole – вентиляционное отверстие

THE CANNING PROCESS

The canning process involves a number of operations using the altering temperatures. After being graded and washed most vegetables and some fruits are blanched either by being immersed in boiling water or by being exposed to steam. The period of exposure may vary from 2 to 10 minutes. Blanching inactivates enzymes which may affect the stability of the food and kills some species of microorganisms. This process removes varying percentages of water-soluble nutrients such as ascorbic acid, B-vitamins, sugars and minerals, but the losses are not serious. Then

the washed open cans are filled with a weighed amount of the food and brine in the case of vegetables and sugar syrup in the case of fruits. After filling the cans are usually passed to an exhaust box in which they are exposed to hot water or steam so that, when the lid is sealed on, a partial vacuum will form in the can.

Being sealed the cans are exposed to sterilization, the amount of heat required depends upon the size of the can, the nature of its contents, and the pH of the food to be sterilized. Then the cans must be cooled slowly by gradually reducing the pressure of the steam used for heating and thus bringing about a gradual reduction of temperature. If the pressure were reduced suddenly the cans would buckle. The cans are then cooled further using water. Since temporary leakage may occur at this point, it is important for the cooling water to be clean and sterile. Cooling is only continued until the cans reach a temperature of 38 °C and then the warmth of the can is sufficient to allow the cans to be dried in the air. This allows to avoid rusting and also reduces the danger of microorganisms present in water on the surface being drawn into the can through a temporary leak.

Modern canning processes are completely automated and are run on a continuous system rather than using batch processes.

There are many variations in the standard canning process. One of the most common is the use of aseptic filling, in which the bulked product and the containers are sterilized separately. The containers are then filled aseptically, i.e. under conditions where the entry of microorganisms is prevented before the cans being sealed. In the case of cans, the cans are filled through a small vent-hole which is then closed with solder. Aseptic canning is mainly used for liquid foods which are heat sensitive and therefore likely to be overcooked in the standard canning process.

Canned foods are very stable and may remain in good condition, for several years, even at ordinary temperatures. However, they can also be exposed to deterioration. The main reasons for spoilage of canned foods are: 1) insufficient sterilization which means that spores of anaerobic bacteria may survive and grow; 2) leakage which is due to either a badly made can or a can which has been improperly sealed; 3) corrosion of the

can which may be due to attack by the content, particularly acid foods, or damage due to storage in unsatisfactory conditions, i.e. storage in a warm, humid atmosphere.

EXERCISES

I. Find the synonyms among the following words:

kind, spoilage, to grade, corrosion, to reach, enough, sort, to attain, completely, to classify, sufficient, species, continuous, adequate, rusting, entirely, deterioration, nonstop.

II. What is the meaning of the prefixes PRE- and RE-? Translate the words:

predominate, pretreatment, predetermine, renew, reproduce, replacement, reequip.

III. Find the suffixes in the following words. What parts of speech do they form? Translate the words, give other examples.

stability, gradually, partial, exposure, serious, exchanger, storage, unsatisfactory, fluidize.

IV. Translate into Russian:

altering temperatures, species of microorganisms, losses, brine, exhaust box, lid, partial vacuum, to expose, to buckle, leakage, batch process, to seal, solder, sensitive, anaerobic bacteria, rusting

V. Translate into English:

сортировка, промывка и бланширование фруктов, водорастворимые питательные вещества, сахарный сироп, снижение давления, временная утечка, стандартный процесс консервирования, асептический розлив, неудовлетворительные условия.

VI. Pay attention to the difference between the modal verb CAN and the verbCAN (консервировать) and its derivatives. Translate into Russian:

a) to can, a can, canning, canned;

b) Vegetables and fruits can be refrigerated, dried, canned and frozen.

VII. Remember all the ways of translating the word AS, AS…AS and translate the following sentences into Russian:

1. For people whose energy requirements are high it is useful to include a reasonable quantity of fat in the diet, as it reduces the bulk of food which must be eaten. 2. Nuts and seeds contain a certain amount of carbohydrates, in some cases as starch, in others as sugars. 3. Food industry output should be as high as possible. 4. As the society developed the process of specialization and concentration in food industry gradually proceeded. 5. Many undesirable changes in food may occur as a result of action of some microorganisms. 6. Seeds are extensively used as a source of vegetable oils. 7. Vitamin C is not as widely distributed in foods as most other vitamins. 8. Milk products such as butter and cheese were produced many centuries ago. 9. The solid portion of vegetables contains proteins and carbohydrates, as well as some amounts of mineral salt and vitamins.

VIII. Remember the translation of the verb TO HAVE:

1. Heat treatment has a different effect on the various microorganisms present in food. 2. Developments in temperature-controlled transportation systems for products have been one of the main factors leading to the rapid expansion of the chilled food market. 3. Before freezing all inedible parts of the food have to be removed. 4. Through the ages there has been a gradual but steady improvement in man’s food – both in variety and quality. 5. Vitamins cannot be synthesized by the body and have to be obtained from diet. 6. If products have been cooled before loading, they have to be isolated from external heat in transport vehicles.

UNIT 10

brittle – хрупкий
desiccation – сушка, высушивание
drum – барабан
film – пленка
fine – мелкий, тонкий
fluidized bed drying – сушка в псевдоожиженном (кипящем) слое;
freeze drying – сублимационная сушка
porous – пористый
powder – порошок, пудра
roller drying – вальцовая (барабанная, пленочная) сушка
scraper knife – скрепер
smoking – копчение
spray drying – сушка распылением
sublime – сублимировать, возгонять
trap – улавливать, захватывать
tray – поддон, поднос, лоток, противень
tunnel drying – туннельная сушка

DEHYDRATION

Drying is probably the most ancient method of food preservation. The traditional method of drying foods was simply to lay the foods in the sun. It is still used in some countries. The term «dehydration» usually refers to artificial drying rather than the natural sun and wind desiccation. Some traditional methods involve the use of other means of microbial growth control in addition to the removal of moisture. For example, both smoking and salting are known to have been used in the traditional methods for drying meat and fish.

The modern process of dehydration consists of the removal of moisture from the food by the application of heat usually in the presence

of a controlled flow of air. It is important that the temperature used should not be too high, since this will cause undesirable changes in the food. Also excessive heat may cause «hardening» where the outside of the food becomes brittle and hard while moisture is trapped in the centre and is unable to pass through the food by the normal processes of diffusion and capillary action.

There are many types of equipment used for dehydrating foods. Some of the more usual methods of drying are:

a) Tunnel drying. In this method the food is placed on conveyor or perforated trays and passed through a warm air tunnel. A more modern development is fluidized bed drying in which warm air is blown upwards and the particles of food are kept in motion. This method is used particularly for vegetables.

b) Spray drying. This method is used for drying fairly liquid foods such as milk and eggs. The food enters the top of a large drying chamber as a fine spray. The spray mixes with warm air, the water evaporates and a fine powder is produced which is removed from the bottom of the chamber.

c) Roller drying. In this method the food is applied in paste form as a thin film to the surface of a revolving heated roller or drum. As the drum rotates the food dries and the dried product is removed from the drum by a scraper knife. Products dried by this method include breakfast cereals and potatoes.

d) Freeze drying. In this method of drying the food is first of all frozen and then subjected to a mild heating process in a vacuum chamber. The ice crystals being formed during tbe freezing stage sublime when heated under reduced pressure, i.e. they change directly from ice to water vapour without passing through the liquid phase.This results in a product which is porous and very little changed in size and shape from the original food. Since little heat is required there is little heat damage and the colour, flavour and nutritive value are affected less than in some other methods of drying. The product being porous can rapidly be rehydrated (reconstituted) in cold water. A wide variety of foods can be dried by this method, e.g.

meat, fish, fruits and vegetables, the weight of foods being reduced by nearly 100 per cent.

e) Evaporation under high vacuum is used for the production of instant (soluble) coffee, tea and orange powder.

EXERCISES

I. How do you change the spelling of the following words to find them in the dictionary:

countries, varieties, applied, dried

II. Define the meanings of the prefix RE-:

rehydrate, remove, reconstitute, replace, reuse, retention

III. What part of speech does the suffix NESS- signify?

healthfulness, usefulness, cleanliness, freshness.

IV. Translate into Russian:

wind desiccation, smoking, brittle, to trap, retention, tunnel drying, perforated tray, spray drying, fine powder, roller, drum, scraper knife, freeze drying, to sublime.

V. Translate into Englis:

средства контроля роста микроорганизмов, поток воздуха, тепловая обработка, вызывать нежелательные изменения, сортировка, бланширование, оборудование, тонкая пленка, подвергаться, пониженное давление, пористый продукт, растворимый кофе.

VI. Don't confuse the words printed in italics and translate the sentences:

a) Tin, nickel, vanadium and several other trace elements are thought to be important in the proper development of human organisms. b) The amount of protein in the cells of vegetables is small, although potatoes, mainly because of the quantity in which they are eaten, contribute 4 % to the total protein content of the average diet. c) Though vitamin C is stable when being dry, in aqueous solution it is easily oxidized especially on exposure to heat, light and traces of metal. d) The

food engineer should be thoroughly acquainted with the principles of the physical and mechanical operations. e) The amount of water passing through the kidney system each day is about 150 litres.

VII. Mind the functions of the word THAT in the following sentences:

1. Quick freezing is defined as that one which doesn't destruct the cell walls. 2. The need to avoid surface freezing of any product limits the lowest air temperature tha can be used. 3. The main disadvantage of these processes is that products undergo some changes in quality. 4. Preservation methods used for meat differ from those of applicable for vegetables. 5. It is sterilization of foods that means the complete destruction of all microorganisms. 6. That deterioration of foods results in loss of their nutritive value is a well known fact.

UNIT 11

acetic acid – уксусная кислота
benzoate – соль бензойной кислоты
benzoic acid – бензойная кислота
beverage – напиток
chemical – препарат, химикат; химический
curing – посол, вяление, консервирование
discoloration – обесцвечивание, изменение цвета
dressing – приправа, соус
fermentation – брожение, ферментация
fungus – грибок
herring – сельдь
inhibit – замедлять, подавлять, тормозить
inoculate – искусственно засевать микроорганизмами
nitrogen – азот
pickle – мариновать
preservative – консервант, консервирующее средство
propionic acid – пропионовая кислота
rancidity – прогорклость, прогорклый вкус
relish – приправа
soak – вымачивать
sorbic acid – сорбиновая кислота
sulfite – сульфит
soda fountain syrup – сироп для содовой газированной воды

USING CHEMICAL PRESERVATIVES

A large range of chemicals called preservatives can be used to control the growth of microorganisms. A food «preservative» is defined as a chemical compound or mixture of compounds applied for the specific purpose of preventing spoilage due to the growth of bacteria, yeasts or molds. These substances may he either added to the product or produced

in it by fermentation. The type of preservative applicable to a particular need is determined by the composition of the food, the type of microbial spoilage that takes place, and the desired shelf-life.

Sugar is known to be the most important chemical food preservative. It preserves foods by inhibiting the growth of bacteria, yeasts and molds at concentrations of at least 65 per cent. The preservation in this case is believed to be effected by dehydration of the microorganisms. Many fruit products such as jams, jellies and syrups are preserved with sugar. However, it is customary to give them a mild heat treatment in a sealed container often in addition to air removal by vacuum. These supplemental processes appear to help control fermentation, surface molding and dis-coloration.

Second in importance only to sugar, is salt. Salting or salting combined with drying is much used in the curing of meats, fish and some vegetables. Salt is antiseptic and while it does not destroy all bacteria, those causing spoilage are kept under control until the moisture content has been substantially reduced. Of course, the salt acts as a drying agent by withdrawing water. In salted, dried fish and meats bacterial and enzymic actions are stopped.

Addition of acids is another way of preserving foods, this method being carried out in one of two manners. The food may be pickled, i.e. soaked in an acid solution such as vinegar (acetic acid). It is the principal preserving agent in salad dressings, mayonnaise, marinated herring, in pickled beets, cucumbers, tomatoes, peas. Sorbic and propionic acids are also effective against yeasts and molds. Another method is to inoculate the food with a culture of selected bacteria and to rely on acid produced by the activities of these bacteria. The simplest example of such action is the inhibition of toxin-producing bacteria by the lactic acid produced in many fermented foods. For example, foods such as yoghurt and sauerkraut (fermented cabbage) are produced in this way.

Sulphur dioxide either in the form of gas or soluble sulfite salts aids in the preservation of acidic foods, particularly beverages. In addition,

it acts as an enzyme poison and greatly improves the appearance of dried fruits and vegetables.

Benzoic acid and its salts have the broadest spectrum of antimicrobial activity and are useful against many spoilage bacteria, fungi and yeasts. Being more effective in acid foods, benzoates are often added to soda fountain syrups, pickle relishes, margarine and other products. Nitrites, such as sodium and potassium nitrites, and nitrates can be used in canned meats and fish, the storage quality of the fish being much improved, especially if the product is strictly fresh and has undergone no decomposition.

Inert gases are often used to supplement other preservation methods. Examples are the use of nitrogen and carbon dioxide in canned foods and oily foods, where it is desirable to eliminate oxygen. Inert gases help to prevent or control oxidative changes such as rancidity in fats.

EXERCISES

I. Mind the words of the same root:

to act – activity – action – active – actual – actively – inactivation – actually – activated.

II. Try to form new words using the following prefixes: RE-, FORE-, EX-, MULTI-, PRE- TRANS-, UNDER-:

heat, change, come, formation, warming, go, sterilize, port, cause, ground, plate, pose.

III. Form the nouns from the following adjectives, using the suffixes –NESS, –ITY:

effective, active, fresh, rancid, original, acid, brittle, uniform, hard, porous.

IV. Translate into Russian:

chemical compound, fermentation, to inhibit, to pickle, toxin-producing bacteria, sulphur dioxide, pickle relishes, to soak, vinegar, herring, to inoculate, sauerkraut, benzoic acid, inert gas, rancidity.

V. Translate into English:

консервант, брожение, дрожжи, обесцвечивание, вымачивать, содержание влаги, мягкая тепловая обработка, молочная кислота, внешний вид, сироп для газированной содовой воды, соль бензойной кислоты, азот, грибки.

VI. Remember all the ways of translating the word FOR and translate the following sentences into Russian:

a) Iron accounts for 0.0005 % of body weight. b) Vitamin B is necessary for normal reproduction and tissue respiration. c) The range of foodstuffs available for primitive man was small for it was restricted to cereals, fruit, oil, milk, meat and fish. d) For some hundred years food processes were mainly based on experience and traditions. e) Letters are still used for naming vitamins, but they are gradually being replaced by the chemical names. f) For the problem of food shortage to be solved a special food programme was worked out. g) Not all the protein supplied by food can be used for growth and repair, for any excess protein is used for energy. h) It is possible to kill microorganisms by holding the food at a high temperature for a definite period of time.

VII. Define the type of SUBORDINATE CLAUSES and translate them:

1. The mechanism of the reaction between sorbic acid and sulfite depends on whether or not oxygen is present. 2. With some fruits and vegetables the rate of respiration during storage is sufficient to require heat removal provided product quality is to be maintained. 3. Whenever heat is used to control microbial growth, both time and temperature are considered. 4. The scientists came to the conclusion the ezymes were diomoleculars increasing the rates of chemical reactions. 5. Although fruit products contain 65 to 75 per cent sugar, it is customary to give them a mild heat treatment. 6. As the temperature of fish falls below its freezing point, ice crystals begin to form throughout the tissue. 7. Microorganisms that require the presence of free oxygen for their growth are known as aerobes, whereas oxygen inhibits the growth of anaerobes. 8. The product will not be maintained at its desired temperature during transportation

unless it is refrigerated. 9. Grain liquors are generally known as beer, whereas the fermented drinks prepared from fruit are called wines. 10. Examination of the product surface does not show whether or not the centre is frozen.

UNIT 12

ambient – окружающая среда, окружающий, охватывающий
bubble – пузырек
conductivity – проводимость
contamination – заражение, инфицирование
decaying amplitude – затухающая (уменьшающаяся) амплитуда
flash – вспышка
hydrogen peroxide – перекись водорода
irradiation – облучение
nonthermal – нетепловой, нетермический
off-flavour – привкус, порок вкуса
oscillating – колебательный, вибрирующий
pulsed – импульсный
restrict – ограничивать
wave – волна
withstand – выдерживать, противостоять
ultrasound – ультразвук
ultraviolet – ультрафиолетовый
voltage – напряжение

NONTHERMAL PRESERVATION METHODS

Nonthermal methods for food preservation are under intense research to evaluate their potential as alternative methods to traditional ones. They are expected to eliminate, or at least minimize, the quality degradation of foods that results from thermal processing. In addition, nonthermal processes use less energy than thermal ones.

Food can be processed nonthermally using high hydrostatic pressure, oscillating magnetic fields, high-intensity pulsed electric fields, intense light pulses, irradiation, chemical, biochemical and hurdle technology. Although some of these technologies have been used for

a long time to preserve food, they have gained recognition as nonthermal methods only in the recent past.

High-pressure processing, also described as high hydrostatic pressure processing, subjects liquid or solid foods, with or without packaging, to pressures between 100 and 900 MPa. It is used for the inactivation of vegetative bacteria, yeasts, molds and certain enzymes in products such as fruit juices, jams and meat products. For example, peaches and pears subjected to a pressure of 410 MPa for 30 min can be stored for 5 years. It should be noted that high-pressure processing acts instantaneously and uniformly throughout a mass of food independing of size, shape or food composition, exposure times ranging from a millisecond pulse to more than 30 min.

High-intensity pulsed electric field processing involves the application of pulses of high voltages at ambient temperature for less than 1 second. Its application is restricted to food products that can withstand high electric fields, have a low electrical conductivity, and do not contain or form bubbles.

Pulsed light is a method that involves the use of intense and short-duration pulses of broad spectrum «white light» (ultraviolet to the near-infrared region). For most applications a few flashes applied in a fraction of a second provide a high level of microbial inactivation. This technology is applicable mainly in sterilizing or reducing the microbial population on packaging or food surfaces. Ultraviolet light is used for treating fruit juices, disinfection of water and food contact surfaces. It may be used in combination with other alternative technologies including various powerful oxidizing agents such as ozone and hydrogen peroxide.

Oscillating magnetic fields are applied in the form of constant amplitude or decaying amplitude sinusoidal waves, the intensity of each pulse decreasing with time to about 10 % of the intensity. The process involves sealing food in a plastic bag and subjecting it to 1 to 100 pulses with a frequency of 50–500 kHz for 25–100 milliseconds. One of the attractive features of this method is that the food can be packaged prior the

processing, thus reducing the possibility of contamination during packaging.

Irradiation of foods was one of the earliest nonthermal preservation technologies and it is often termed «cold sterilization». The process involves the exposuse of food to radiation with beta-, gamma-, X-rays or microwaves. One of the attractions of irradiation is its ability to pasteurize foods in the frozen state, but its application is limited because of high cost of equipment, necessity of testing the products for safety reasons and the development of unpleasant off-flavors.

EXERCISES

I. What do the prefixes PRE- and POST- mean? Form new words using these prefixes:

a) hold, drying, occupy, evaporation, determine;

b) irradiation, graduate, war, position.

II. Translate the words proceeding from the meaning of the words given in brackets:

irradiate (radiation), consideration (consider), emission (emit), appreciably (appreciate), opposed (opposition), periodically (period), processing (process), contaminate (contamination), carefully (care), exposure (expose), inactivation (active).

III. Why are these words placed here together?

magnetic, electric, antiseptic, enzymic, numerous, simultaneous, enormous, instantaneous.

What parts of speech may they be? Give examples of your own.

IV. Translate into Russian:

pressure, irradiation, amdient temperature, nonthermal food preservation technology, high-intensity pulsed electric field, electrical conductivity, oscillating magnetic field, oxidizing agents, decaying amplitude sinusoidal waves.

V. Translate into English:

микроволны, контактная поверхность, ультрафиолет, заражение пищи, электропроводность, время выдержки, ультразвуковые волны, инфракрасная область (спектра).

VI. Translate the following sentences paying attention to MODAL VERBS and their equivalents:

1. The effects of critical process factor on pathogens need to be studied further. 2. While using this method the food have to be packaged prior to processing. 3. To achieve microbial inactivation high pressure processing must be uniform throughout a mass of product. 4. Chemical changes in the food should be minimized. 5. Full spectrum light may be used depending on the degree of sterilization extected. 6. The researchers are able to reduce the negative effect of irradiation. 7. Thermally procecessed milk may have a cooked flavor accompanied by a loss of essential nutrients.

VII. Mind the different functions of FOR in the following sentences:

1. Sterilization involves heating for a longer time or at a higher temperature than is necessary for pasteurization, for it has to destroy all kinds of organisms and their spores in food. 2. Sodium sulphite is usually added to the blanching water for this aids vitamin C retention in vegetables and fruit. 3. Salts of benzoic acid are used in fresh juices for they inhibit fermentation for several weeks. 4. Ultraviolet rays are not widely used in milk preservation for only a thin layer of it can be successfully irradiated.

LANGUAGE PRACTICE UNITS 7–12

Comprehension:

Revise texts 7–12 and decide which statements are true or false:

1. Chilling storage is mainly referred to the use of temperatures at or below –18 °C.

2. Prior to canning process vegetables should be graded and washed.

3. Tunnel drying is widely used for liquid foods.

4. Many fruit products such as jams, jellies and syrup are preserved with salt.

5. Essential nutrients undergo minimal changes during nonthermal processing.

6. Application of pulsed electric fields is restricted to foof products that can withstand high electric fields.

Speaking:

Choose a topic and discuss it with your partner.

1. Dehydration equipment.

2. The canning process.

3. Methods of freezing.

Speaking tips:

– Explain things clearly.

– Use some of your own ideas.

– Consider your partner opinion.

Helpful phrases:

– To begin with, I would suggest...

– Would you go along with that...

– No, I'd rather think that...

– Well, you certainly have a point, but...

– Don't you think...?

– That's absolutely right...

– May I just cut in here...

Writing:

Revise the text 12, collect the information and write an article about nonthermal preservation methods.

UNIT 13

homeostasis – гомеостаз

hurdle – барьер, препятствие; фактор, регулирующий развитие микроорганизмов

hurdle effect – препятствующий эффект

hurdle technology – барьерная технология

inherent – присущий, свойственный

modified atmosphere packaging – упаковка в газовой атмосфере регулируемого состава

novel – новый

overcome – преодолевать

poison – яд, отравлять

puree – пюре

redox potential – окислительно-восстановительный потенциал

slice – ломтик

stability – стойкость

synergistical – синергетический, сопутствующий

target – объект, цель

HURDLE TECHNOLOGY

Along with traditional food preservation techniques there is a large and growing number of improved and radically new ones, that are being researched or are in the early stages of application, hurdle technology being one of them.

The microbial stability and safety of most traditional and novel foods is based on a combination of several physical and chemical parameters (hurdles) which can be adjusted and should not be overcome by the microorganisms present. This is illustrated by the so-called hurdle effect. The hurdle effect is of fundamental importance for the preservation of foods, since the hurdles in a stable product control microbial spoilage, food poisoning and, in some instances, the desired fermentation process.

The hurdle concept illustrates only the well-known fact that complex interactions of processing methods, storage temperatures, water activity, pH, redox potential, etc., inhibit or inactivate various microorganisms, thus ensuring microbial stability and safety of foods.

Hurdle technology (synonymously called combined methods, combined processes, combination preservation, combination techniques) proved to be very successful and it is widely used in the preservation of meat, dairy products, fruits and vegetables.

For each stable and safe food a certain set of hurdles (factors) is inherent, which differs in quality and intensity depending on the particular product, however, in any case, the hurdles must keep the formal population of microorganisms in this food under control. The microorganisms present in a food product should not be able to overcome the hurdles, otherwise the food will spoil.

For foods preserved by hurdle technology different hurdles may act synergistically. A synergistic effect could become true if the hurdles in a food hit, at the same time, different targets (e.g.cell membrane, enzyme systems, pH, water activity, redox potential) within the microbial cell and thus disturb the internal equilibrium of organisms (homeostasis). In practical terms this could mean that it is more effective to use, for example, different preservatives in small amounts than only one preservative in larger amounts, because different preservatives might hit different targets within the bacterial cell, and thus act synergistically.

Foods based on hurdle technology can be found in industrialized as well as in developing countries. For example, some dozens of meat products with fresh-product characteristics, but stable and safe without refrigeration for at least 6 days at 30 °C are being manufactured in Germany. An Italian pasta product was stabilized for several weeks by using as hurdles a water activity reduction and mild heat processing, as well as modified atmosphere packaging or ethanol vapour during storage, combined with moderate chilling temperatures. Combined processes for the preservation of high moisture fruit products have been developed in several Latin American countries and have been applied to peach halves,

pineapple slices, mango slices and puree, papaya slices, puree of banana as well as whole figs and strawberries. These new technologies were based on combination of a mild heat treatment (blanching for 1–2 minutes with saturated steam), slight reduction in water activity by the addition of glucose or sucrose, lowering pH by the addition of citric or phosphoric acids and the addition of antimicrobials (potassium sorbate or sodium benzoate, and sodium sulfite or sodium bisulfite) to the syrup of the products. These products stabilized by hurdle tecnology proved to be stored during 3–8 months at 25–35 °C.

For developing countries, foods storable without refrigeration are of special interest, because refrigeration (energy) is costly and not continuosly available. So food preservation procedures should be inexpensive and simple, but reliable.

EXERCISES

I. Form the nouns from the given verbs using suffixes –TION, –MENT:

a) sterilize, compose, combine, consume, distribute;

b) develop, equip, require, improve, treat.

II. Find the correct form of the word on the left so that it could be used on the right:

INTENSIVE: The microbial stability of this product is based on hurdle of different _____.

ADD: Sodium sulfite is usually _____to the blanching water.

CAN: Modern _____ processes are completely automated.

III. What is the meaning of the prefix SUB-?

subclass, subdivide, submarine, subsection, subscribe.

IV. Translate into Russian:

novel product, microbial spoilage, hurdle effect, desired fermentation, redox potential, modified atmosphere packaging, synergistic effect, food poisoning, puree, slice, combination techniques.

V. Translate into English:

фактор, регулирующий развитие микроорганизмов, активность воды, клеточная мембрана, равновесие организмов, объект (цель), гомеостаз, барьерная технология, окислительно-восстановительный потенциал, упаковка в газовой атмосфере регулируемого состава, мягкая тепловая обработка, стойкость.

VI. Pay attention to the proper translation of the words UNTIL, UNLESSS:

1. It is difficult to ensure even distribution of an inhibitor in the final cheese, unless it is added while the milk is still liquid. 2. Dehydrated foods were of very poor quality until 1920 when the necessity of moisture and enzyme control was recognized. 3. Unless cereal grains are protected against moisture they will mold. 4. Canned foods were of little importance until the scientists showed that the cause of food spoilage was microorganisms. 5. Until can-making machinery was developed manufacturers had to make cans by hand or use bottles.

VII. What grammar phenomena can you find in these sentences? Translate them into Russian:

1. The most impressive progress in the application of hurdle technology have been made with foods which remain stable, safe and tasty even if srored without refrigeration. 2. Some other bacteria are able to multiply by using ozygen and thus cause the redox potential of the product to decrease. 3. The sequence of hurdles having been revealed, the production of fermented sausages became less empiric and more advanced. 4. High moisture foods subjected to mild heat treatment and based on hurdle technology, and thus storable without refrigeration, have been named shelf stable products. 5. About 15 % of the meat supply in China, which uses much more meat than any other country in the world are processed into meat products. 6. A synergistic effect could become true, if the hurdles in a food hit different targets at the same time. 7. Since food stability is often achieved by water activity reduction, the homeostasis of microorganisms has been studied extensively with restect to food preservation.

UNIT 14

buttermaking – маслоделие
cream – сливки
dairy – молочный
dairy dessert – сладкое молочное блюдо
dried milk – сухое молоко
evacuation – откачивание (воздуха), вакуумирование, разрежение
evaporated milk – сгущенное пастеризованное молоко (без сахара)
exposure – воздействие, выдержка
inferiority – более низкое качество
keeping quality – стойкость
mild – мягкий, слабый
ripen – созревать
shelf-life – сохраняемость, продолжительность хранения
steam injection – впрыскивание пара
ultrasound – ультразвук
sweetened condensed milk – сгущенное молоко с сахаром
vacreation – вакреация (пастеризация молока в вакууме)

PRESERVATION OF MILK AND DAIRY PRODUCTS

Milk is known to be the most complete food of all. It contains protein in large quantity and of the highest quality, carbohydrates and fat being also present in sufficient quantities. It is also rich in vitamins, minerals and amino acids. Milk can be prepared in many forms for consumption. Some is sold as fluid milk, some is made into cream, ice cream, soft cheese, hard cheese, butter, evaporated, sweetened condensed or dried milk.

Being an excellent media for the growth of many types of micro-organisms, milk and most dairy products must be carefully preserved.

There are different ways of their preservation such as heat treatment, refrigeration, freezing, using of chemical preservatives, irradiation, sound waves, magnetic fields, high pressure or electric current.

The mild heat treatment called pasteurization is usually used for milk and cream preservation. The objectives of pasteurization are to kill all the pathogens that may enter the milk and be transmitted to people and to improve the keeping quality of milk. When milk is pasteurized for the manufacture of cheese or cream is pasteurised for making butter, a third objective is to destroy microorganisms that would interfere with the activities of desirable organisms, such as the starter culture, or cause inferiority or spoilage of the product. The pasteurization process for milk involves heating the milk in large tanks to 63 °C for 30 minutes to eliminate pathogens and enzymes.

Milk may also be sterilized either by an in-bottle sterilisation process or by UHT (ultra high temperature) process. The UHT range begins at around 88–100 °C and may extend to 150 °C or above, exposure times may be from 1 second to some seconds. The main disadvantages of UHT process is that the severe heating needed can affect or alter the nutritive value, the colour and the flavour of the resultant product, the vitamin content being reduced.

Cream for buttermaking is given a greater heat treatment during pasteurization than market cream, because cream itself is sure to contain a higher population of microorganisms than milk. Rapid heating of cream is accomplished by injecting steam or by a combination of steam injection and evacuation in a process known as vacreation.

Most dairy products require the use of low temperatures as one factor in their preservation, and often it is the most important factor. Milk is kept at refrigeration temperatures during storage on the farm, in the truck or tank during transportation to the plant and during storage there. Fermented milks and unripened cheeses are chilled until they reach the consumer. Most kinds of ripened cheese also are stored at chilling temperatures after their ripening is complete.

Ice cream and other dairy desserts are frozen as part of the manufacturing process and are stored in the frozen state, where microbial multiplication is impossible. Butter in storage is held at –17 °C to –18 °C or lower. Frozen oream is kept in considerable amounts at a similar temperature. Milk concentrated to one third its volume, can be frozen at –17 °C to –18 °C by freeze-drying method and stored at –23 to –24°C for several weeks without deterioration.

Different chemical preservatives are known to be widely used in dairy products preservation. Added sugar acts as a preservative of sweetened condensed milk. Sodium chloride is added in the manufacture of butter and various kinds of cheese. Various gases including nitrogen and carbon dioxide have been used as a package atmosphere for some kinds of cheese to increase their shelf life. Cheese is also smoked primarily for the addition of flavour, although the drying and the chemical preservatives from the smoke may improve the keeping quality.

Irradiation, sound waves, magnetic fields, high pressure and electric currents may be used in some cases. For example, ultraviolet light in the diary industry is used for irradiation of rooms to reduce the number of microorganisms in the air in processing rooms where sweeted condensed milk is being prepared or cut cheese is being packaged. Ultrasonic vibrations combined with a temperature of 40 °C to 50 °C kill most of the bacteria in milk or in cheese during ripening. Alternating electric currents have been applied to milk as a method for rapid heating in HTST pasteurization.

EXERCISES

I. Remember the terms used in the text:

HTST pasteurization process, UHT process, in-bottle sterilization process, buttermaking, evacuation, vacreation, ultraviolet light, ultrasonic vibrations, starter culture.

II. Form antonyms from the following adjectives, using different prefixes:

desirable, complete, sufficient, advantageous, pleasant, responslble, definite, usual, possible, proper, satisfactory, comfortable, continuous.

III. What helps you define the part of speech of the following words?

radically, stability, highest, fundamental, importance, desired, larger, poisoning, safety, classify, stable, synonymously, improvement, successful, nutritive, particular, moisture, reduction, citric, indicator.

IV. What do prefixes UNDER- and OVER- mean? Form antonyms from the following verbs using these prefixes:

cook, ripe, estimate, load, salt, sterilize, heat.

V. Translate into English:

аминокислоты, сливки, мороженое, сыр (мягкий и твердый), молоко (сгущенное с сахаром, сгущенное стерилизованное без сахара, сухое), электрический ток, стойкость молока, внешний вид, вкус, закваска, полученный продукт, продолжительность хранения продукта, несозревший сыр, размножение микробов, сладкое молочное блюдо.

VI. Find the INFINITIVES and INFINITIVE CONSTRUCTIONS in the following sentences and translate them:

1. Sugar and salt are known to be widely used in food industry. 2. The main objectives of milk pasteurization are to kill all the pathogens and to improve its keeping quality. 3. To ensure the maximum retention of the natural properties of the food it is necessary for the technologist to know thr composition of foods. 4. Cream is sure to contain a higher population of microorganisms than milk. 5. Vitamin D in food appears to be more stable than vitamin A. 6. Fluorine is certain to have an important prophylactic action in bones and teeth. 7. To extend the period of storage and consumption has been one of the major problems. 8. Shelflife may be defined as the time it takes to deteriorate to an unacceptable level. 9. To meet these requirements the following means are desirable. 10. It was

found aseptic packaging to restrict the access of microorganisms to finished product.

VII. Pay attention to the translation of the word BEFORE, AFTER and SINCE in the following sentences:

1. The temperature used should not be too high, since this will cause undesirable changes in the food. 2. Appert proposed to preserve foods by heating them in hermetically sealed containers long before Louis Pasteur laid the foundations for the science of bacteriology. 3. The product has to be cooled after sterilization in order to avoid buckling of containers. 4. Since the origin of civilization man has always processed food. 5. Before being blanched fruits should be graded and washed. 6. The preservation of bread staling was made possible after it had been found that some ingredients could retard this process. 7. Before pasteurization the milk should be filtered.

UNIT 15

drop – падать, понижать
ham – ветчина
ingredient – ингредиент, компонент
lamb – барашек, молодая баранина
lean – тощий, скудный
meat balls – фрикадельки
muscle tissue – мышечная ткань
mutton – баранина
patty – брикет из мясного фарша, котлета
pork – свинина
slaughter – убой (скота)

PRESERVATION OF MEAT

Meat is known to play the most significant role in the diet. Being an exellent source of protein to the human body, meat provides about a half of the total protein content of the average diet. All meats contain fat, the percentage of this nutrient varying from animal to animal and from one part of it to another. Meat is also considered rich in minerals and some vitamins. It is a good source of the B-complex vitamins, thiamin and niacin being the most important ones. Most of the essential minerals are found in meat, particularly phosphorus, iron, copper and trace elements.

Being highly perishable fresh meats cannot be stored under normal conditions and therefore must be cooled soon after slaughter and kept just above the freezing point until used or preserved by some other methods. To be preserved meat may be canned, chilled, frozen, dried, cured, smoked, pickled or sometimes irradiated.

The canning of meat is a very specialized technique in that the procedure varies considerably with the meat product to be preserved. Commercially canned meats can be divided into two groups on the basis of the heat processing used: (I) meats that are heat-processed to make them

sterile; and (2) meats that are heated enough to kill part of the spoilage organisms but must be kept refrigerated to prevent spoilage. Canned hams and luncheon meats are so handled. Meats of the former group are processed at the temperature of 98 °C, the size of can being usually less than 500 grammes. Meats of the latter group can be packed in containers up to 9 kilogrammes and are processed at temperatures of about 65 °C.

More meat is preserved by the use of low temperatures than by any other method, and much more by chilling than by freezing. Modern methods involve chilling meat promptly and rapidly to temperatures near freezing and chilling storage at only slightly above the freezing point, storage temperatures varying from –1.4 to 2.2 °C. The time limit for chilling storage of beef is found to be about 30 days, for pork, lamb and mutton 1–2 weeks, depending upon the numbers of microorganisms present, the temperature and the relative humidity. Storage time can be lengthened by keeping of meats in an atmosphere containing carbon dioxide or ozone.

Freezing is used to preserve meat during transportation over long distances or for holding until times of shortage and, of course, considerable quantities of meat now are frozen in home freezers, the preservation of frozen meat is increasingly effective as the storage temperature drops from –12.2 toward –28.9 °C.

Preservation by heavy salting is an old method, ordinally salting being combined with curing and smoking in order to be effective. The curing agents permitted are sodium chloride, sugar, sodium nitrate, sodium nitrite and vinegar, only the first four being commonly used.

Drying meats has been practiced for centuries. It is usually combined with salting and smoking. Drying may be accomplished in vacuum, in trays or by other methods. The final product keeps without refrigeration. Freeze drying is mostly used for preservation of processed products such as patties and meat balls rather than fresh meat.

EXERCISES

I. Define the meaning of the prefix DIS - :

disadvantage, discolouration, dispersion, discomfort, dissolve, disproportion.

II. Find the synonyms among the following words:

to call, to permit, desiccation, to divide, to involve, proliferation, quickly, drying, to separate, to allow, to handle, preservation, to accomplish, to include, multiplication, to name, rapidly, to process, conservation.

III. Form nouns from the given words using proper suffixes and translate

them into Russian:

except, store, consume, multiply, grow, effect, vibrate, improve, expose, treat, press, maintain.

IV. Translate into Russian:

muscle tissue, lean meat, kidney, deficient, slaughter, curing, smoking, pickling, canned ham, ingredients, patty, meat balls.

V. Translate into English:

общее содержание белка, микроэлементы, точка замерзания, баранина, свинина, относительная влажность, посол, сублимационная сушка, организмы, вызывающие порчу пищевых продуктов, скоропортящееся свежее мясо, транспортировка на большие расстояния.

VI. Remember the translation of the formal subjects IT, ONE, THERE into Russian:

1. Since early times there has been a close link between evolution of mankind and the manufacture of food. 2. One cannot say that food science is very old. 3. In order to determine the heating process time for a given food, it is necessary to obtain information on heat resistance of microorganisms. 4. Niacin is one of the most stable water-soluble vitamins. 5. The range of foodstuffs available for primitive man was small for it was restricted to cereals, fruit, honey, milk and fish. 6. One should

know that there exist several methods of food preservation. 7. Fish is still principal food of millions of people, as it has been for centuries. 8. Earlier it had been thought that air or oxygen was the main cause of food spoilage. 9. A well balanced diet is one which meets all requirements of the human body.

VII. Define the type of ASYNDETIC SUBORDINATE CLAUSES and translate them:

1. Later the scientists came to the conclusion the ferments were not living organisms but chemical substances of complicated structure and required the living cells for their manufacture. 2. Had a break in cold chain occurred, the consequences might have taken various forms resulting in food deterioration. 3. The food a person consumes should be planned to provide adequate amounts of the essential nutrients. 4. From proteins the body gets the amino acids it needs for building and repairing tissues. 5. One should take into account several vitamins are easily destroyed at high temperatures or in sunlight. 6. Had ther been no prohibition on alcoholic beverages their sales in the US would have been 2 billion dollars in 1929.

UNIT 16

airtight – воздухонепроницаемый
crush – дробить, измельчать
decomposition – распад, разрушение
dip – погружать, окунать
flesh – плоть, мясо (мышечная ткань)
nutritive value – питательная ценность
seafood – морепродукты
thaw – таять, оттаивать
trauler – траулер
wate glaze – ледяная глазурь

FISH PRESER VATION

Fish is still a principal food of millions of people as it has been for centuries. Along with meat, fish and seafood are an excellent source of protein, fat content varying fom one per cent or less to 15 per cent dependind upon the kind of fish. Added nutritional values of fishery products include a desirable balance of essential minerals, calcium and iodine being the most important. Fish also contains vitamins: A, D, K, and B-complex. Fish liver oil has been considered to be the best source of vitamin A.

Of all the flesh foods fish is the most susceptible to microbial spoilage, small fish being more perishable than large ones, and fatty fish deteriorating more rapidly than lean ones. Its preservation therefore involves prompt treatment by preservative method, often these methods being rigorous compared with those used on meat. Fish preservation can be accomplished by chilling, freezing, salting, drying, smoking, canning or combinations of these methods.

When outside temperatures are high and distances of transportation are great, it becomes necessary to chill the fish and seafood on the trawlers by packing in crushed ice or by mechanical refrigeration in order to slow

the microbial growth and oxidation until the products are marketed or are proceeded for longer preservation. The time allowable for holding in ice or in chilling storage will vary considerably with the kind of fish, but will not be long in most cases.

If necessary fish previously packaged may be frozen. Freezing kills some but not all the microorganisms present, and growth will take place after thawing if time permits. For deterioration to be protected frozen fish can also be dipped in cold water to form a water glaze at its surface. Then the glazed fish are kept in cold storage rooms at temperature of –28 °C or lower, use of lower storage temperatures being effective in retarding adverse chemical changes such as oxidation and protein denaturation, which otherwise cause excessive deterioration upon prolonged storage.

Some fish and seafoods are packed into cans and then sterilised or pasteurized. The canning operations are relatively standard. The fish is inspected, washed, cut into can length portions. Then cans are filled automatically, the salt is added, the cans are sealed under vacuum and sterilized.

Curing methods include salting, smoking, drying and pickling. Most cured fish have greatly lowered moisture content, this decreasing bacterial decomposition. Curing also adds chemicals to fish which further retard spoilage. Benzoic acid, sodium and potassium, nitrite and nitrates have been found to lengthen the keeping time.

Formerly, fish was smoked primarily for its preservation, but now smoking is used primarily for flavour. The smoking may be done at comparatively low temperatures (26.7 to 37.8 °C) or at high temperatures like 63 to 92 °C, which result in partial cooking of the fish.

Pickling of fish may mean salting or acidification with vinegar wine or sour cream. Herring is treated in various ways: salted, spiced and acidified. Various combinations of these treatments coupled with an airtight container preserve the fish, although refrigeration also must be employed for some products.

EXERCISES

I. Translate the following adverbs:

primarily, comparatively, greatly, further, automatically, lightly, suitably, generally, relatively, previously, promptly, considerably, favourably, still.

II. Form the names of processes from the given verbs. Translate then into Russian:

deteriorate, chill, can, dry, smoke, freeze, heat, glaze, pack, cut, fill, thaw, pickle, salt.

III. Choose the necessary word and insert it into the sentence

chemical, organic, trace, inorganic:

1. Vitamins and minerals are necessary to regulate body processes, the vitamins being the _____ compounds and mineral elements being present in food mostly in the form of ____ salts.

2. Manganese, zink, iodine, fluorine are necessary in _____ amounts.

3. Water is also formed within the body by _____ reactions.

IV. Translate into English:

морепродукты, содержание жира, погружать, питательная ценность, траулер, измельченный лед, окисление, распад, закатывать (консервную банку), рассол, погружение, ледяная глазурь, поток воздуха, сельдь, герметический.

V. Find all ING-FORMS in the following sentences and translate them:

1. In drying water evaporates from the food resulting in reduction of its content and activity. 2. At present over 30 enzymes are widely used commercially, most of them being applied in food industry. 3. Foods were frozen in ancient times using ice and snow. 4. Though vitamin C is stable when dry, in aqueous solution it is easily oxidezed when being exposed to heat or light. 5. Being readily air-dried cereals are readily kept in their naturel state. 6. In addition to preserving the food dehydration reduces the weight and bulk of the food, lowering transportation and packaging costs.

7. Iron being a trace element, the human body contains only 3 g of this substance. 8. Adequate packaging extends the shelf-life, improves safety while maintaining the quality of the food. 9. Food science is rather young, its rapid development starting only in the middle of the twentieth century.

UNIT 17

alkaline sodium – щелочной натрий
borax – бура, пироборнокислый натрий
hypochlorite – гипохлорит
lettuce – салат-латук
precipitation – осаждение
shrinkage – усушка, усадка
sodium chloride – хлористый натрий
soften – размягчать
wilt – вянуть, увядать
wrap – обертывать, заворачивать

PRESERVATION OF VEGETABLES AND FRUIT

Vegetables and fruit are very important food products. They are characterized by a high moisture content, ranging from 75 to 95 %, are relatively low in protein but rich in carbohydrates, organic acids and their salts, vitamins, minerals and other valuable substances. However fresh vegetables and especially fruit are readily subjected to spoilage, the consumption of each of them being limited by restricted areas of growing and a definite harvesting time. In addition to, if their surfaces are moist or have been damaged, growth of some microorganisms is sure to be accelerated.

To preserve these staple foods or to delay their spoilage chilling, freezing, drying, fermentation, canning or chemical preservatives may be used. Most vegetables and fruits to be preserved without special processing are cooled promptly and kept at chilling temperatures. The chilling is accomplished by use of cold water, ice, mechanical refrigeration or by vacuum cooling (moistening plus evacuation) as used for lettuce. For adequate chilling storage of each kind of the product optimal temperature, relative humidity, air composition and air circulation should be provided.

The temperature varies between 6 °C and 10 °C. The optimal relative humidity must not be too low, otherwise the wilting and softening of vegetables or the shrinkage of fruit can occur. It must not also be too high because in this case precipitation of moisture on the surface of the product will favour microbial spoilage. To control the composition of an atmosphere in the storage rooms means to regulate oxygen and carbon dioxide concentration. Ozone in concentrations of 2 to 3 ppm in the atmosphere has been found to double the storage time of loosely packed small fresh fruits, such as grapes, strawberries, raspberries.

The freezing process reduces the number of organisms, but on the average about half of them are killed. This method is not widely used for vegetables and fruit preservation as it causes some damage to their tissues, resulting in wilting and release of some juice.

Drying by heat destroys yeasts and most bacteria, but spores of bacteria and molds usually survive. Microbial counts on the dried vegetables appear to be considerably higher than on the dried fruit, because there are higher numbers on them before drying and most vegetables are less acid than fruit and consequently the killing effect of heat is less.

Vegetables and fruit can also be treated with various chemicals before or during storage to aid in their preservation. Chlorinated water and borax solution may be used in washing some kinds of vegetables. Sodium chloride is the only added chemical preservative in common use. Fruit can be treated by chemicals by dipping, spraying or wrapping in materials containing some preservatives. Among substances applied to the outer surface of fruit are waxes, hypochlorites, alkaline sodium and others. As a gas or fog about the fruit, carbon dioxide, ozone and ethylen plus chlorinated hydrocarbons have been tried. Sulphur dioxide and sodium benzoate are preservatives that have been added directly to fruit, most of the chemicals mentioned having been primarily antifungal in purpose.

EXERCISES

I. Define the meaning of the prefix ANTI- in the words:

antifungal, antiseptic, antibiotic, antimicrobial.

Give the same examples in Russian.

II. Innumerate all the names of vegetables and fruits you know.

III. Find a synonym for the underlined word:

to restrict microbial growth

to delay deterioration

to undergo spoilage

to be cooled promptly

optimal relative humidity

to control oxygen concentration

loosely packed berries

microbial counts

consequently

to dip in brine

IV. Translate into Russian:

harvesting time, vacuum cooling, moisture content, lettuce, strawberries, raspberries, porosity, to impart, consumption, evacuation, softening, wilting, chlorinated water, shrinkage, borax, to dip, precipitation, solution, to spray, wax, to wrap, outer surface, fog, antifungal.

V. Translate into English:

1. Осаждение влаги на поверхности фруктов способствует их порче.

2. Замораживание может вызвать повреждение тканей.

3. Споры бактерий обычно не погибают во время сушки овощей и фруктов.

4. Иногда в целях сохранения яблоки покрывают тонким слоем воска.

VI. Pay attention to PARTICIPLE II and the verbs in PAST SIMPLE in the following sentences and translate them:

1. Chilled storage in refrigerated chambers at temperatures above freezing is a widely used food preservation method. 2. When filled aseptically, the containers were closed with solder. 3. If properly processed and refrigerated a product can be stored for several weeks. 4. Chilling with crushed ice or an ice/water mixture is simple, effective and commonly used for fish cooling. 5. The washed open cans are filled with cherries and sugar syrup. 6. Frozen food storage will preserve food for months and years it properly packaged. 7. The products that are not consumed in fresh condition can be used in processed form for a long period of time and by people in regions located far from the production area. 8. Unless cooled slowly by gradually reducing the pressure, the cans would buckle. 9. Canned foods can also be exposed to deterioration because of insufficient sterilization or corrosion of the can.

UNIT 18

breadmaking – хлебопечение
developer – тестомесильная машина
divider – тестоделительная машина
dough – тесто
emulsifier – эмульгатор
intermediate proof – промежуточная расстойка
knead – месить (тесто)
lard – свиное сало
loaf – батон, буханка, булка
non-fat milk solids – сухое обезжиренное молоко
oven – хлебопекарная печь
rounder – тестоокруглительная машина
solids – сухие вещества
spongy – рыхлый
stale – черствый, черстветь
sticky – липкий

BREADMAKING AND PRESERVATION OF BAKERY PRODUCTS

Bread is certain to be the basis of man's food and a valuable source of vegetable protein, vitamins of B complex and some minerals such as calcium and iron. Nowadays, breadmaking is a large-scale industry with highly complex technology, the daily capacity of mechanical bakeries exceeding 250,000 tons. The assortment of bread and bakery products is much wider than in any other country and includes about 600 names.

Bread is produced by making dough from cereal flour, water, yeast, salt and sugar, non-fat dry milk solids, lard and emulsifiers being added if it is necessary. The ingredients are thoroughly mixed to assure a uniform distribution and to form a homogeneous mass, the time period of this operation being exactly determined and the temperature being carefully

controlled. The dough is next passed into a developer where it is kneaded to bring about the desired structure. The developed dough is taken to the fermentation chamber where it undergoes the second main phase of bread production called fermentation. During this process the yeasts act upon the sugars transforming them into carbon dioxide and alcohol, the dough increasing in size and acquiring a light, spongy character. The fermented dough flows into a dividing machine where it is cut into pieces of proper weight corresponding to single units of the finished product.

When the dough pieces leave the divider and are conveyed to the rounder, they are irregular in shape with sticky cut surfaces from which the gas can readily diffuse. The function of the rounder is to make a smooth and relatively thick skin around the dough pieces and to form them into balls. The rounded dough balls are next subjected to a brief period of fermentation called the intermediate proof, and moulded into loaves ready to be placed in the baking pans. Then the moulded dough pieces are subjected to the final proofing in large chambers and are sent to the oven.

The actual baking process is really the last and most important step in the production of bakery products. Through the heat action the dough mass is transformed into a light, porous, easily digestible product, the changes involved being numerous and complex. All of the reactions involved in changing the dough into bread must occur in certain sequence and require controlled conditions.

Bread and bakery products are known to be perishable because of their becoming stale or because of mold growth. Staling appears to be associated with changes in the starch, and the bakery products become hard and dry. Mold growth develops in wrapped goods when humidity is high and temperature is also fairly high.

Staling can be prevented by proper packaging, freezing or the addition of emulsifying agents, milk or small amounts of fat. Bread and baked products can be wrapped in waxed paper or in plastic film or may be packed in carton which is completely impervious to moisture. Bread frozen and maintained at –28 °C retains its freshness for many months. Mold growth can be prevented by cold storage, adequate packaging,

chemical preservatives or irradiation. A storage temperature of about 4.4 to 7.2 °C is recommended for the dry products.

EXERCISES

I. Do you know adjectives having the same root as the given words?

chemistry, sponge, digest, preserve, biology, porosity, bake, distinct, effect, value, homogeneity, desire, number, stick, moisture.

Try to form adjectives using the necessary suffixes:

(Key: -al, -y, -ible, -ous, -able, -ive, -proof).

II. Form the names of machines from given verbs. Translate them into Russian:

mix, develop, knead, divide, round.

III. Translate into Russian:

starch, flour, yeast, fermentation chamber, wrap, dough, breadmaking, exceed, intermediate proof, non-fat dry milk solids, staling, sticky, mould, emulsifiers.

IV. Translate into English:

1. После перемешивания все составные части должны представлять собой однородную массу.

2. В тестомесильной машине тесто приобретает необходимую структуру.

3. Во время процесса брожения дрожжи превращают сахар в углекислый газ и спирт.

4. Из тестоделителя куски теста поступают в тестоокруглитель.

5. Затем тесто подвергается промежуточной расстойке.

V. Remember all the possible ways of translating the verbs SHOULD, WOULD, COULD, MIGHT into Russian. Translate the following sentences:

1. Preservation methods should be applied as early as possible, otherwise foods will deteriorate before processing. 2. If there were only a few microorganisms present at athe start, then a few hurdles would be

sufficient for the stability of the product. 3. The loss of nutrients could be significantly reduced by using adequate preservation techniques. 4. Combining of hurdle technology with modern preservation methods should be strengthened, because it might turn out that it is essential for these processes too. 5. It was shown that adding some chemical substances woul inhibit the growth of microorganisms or cause their death. 6. Food preservation procedures should be inexpensive and simple but reliable.

UNIT 19

aging – созревание, выдерживание
barley – ячмень
barrel – бочка
beer – пиво
brewing – пивоварение
carbonate – газировать, насыщать газом
clarify – осветлять, очищать
corn – кукуруза
crush – дробить, измельчать, перетирать
hops – хмель
germ – росток
germinate – прорастать, проращивать
malt – солод
malt adjunct – солодовая добавка
mash – затор, затирать солод
mashing – разварка, затирание солода
mature – созревший
mill – размалывать, мельница
residue – осадок
rinse – ополаскивать, промывать
settle – оседать, осаждаться, отстаиваться
wheat – пшеница
wort – сусло

BEER AND BREWING

Beer is found to have considerable nutritive value. The chief constituents of beer are water, carbon dioxide, alcohol, carbohydrates, proteins, minerals. In addition there are a number of important vitamines of the B-complex present in relatively high concentrations, especially riboflavin and nicotinic acid. The mineral substances consist of the

phosphates and chlorides of calcium, iron, potassium, sodium and some trace elements.

Beer is known to be the principal malt beverage produced. It is made of malt, hops, yeasts, water, and malt adjuncts. The malt is prepared from barley grains which have been soaked at 10 to 15.6 °C, germinated at 16 to 21 °C for 5 to 7 days and dried, the germs being removed afterwards. Then the malt is crushed before use. Hops are dried flowers of the hop plant, but recent development includes the use of concentrated hop extracts or vacuum-packed milled hops as a replacement for the dried whole hop flower. The malt adjuncts are starch- or sugar-containing materials added to addition to the carbohydrates in the malt. Starch adjuncts include corn, rice, wheat, barley, soyabeans, potatoes, etc., the former being used most frequently. Sweet adjuncts are materials like sugar and syrups.

Malting is followed by mashing. The purpose of mashing process is to make soluble as much as possible of the valuable portion of the malt and malt adjuncts and especially to cause hydrolysis of starches and protein. The main malt mash is prepared by mixing the crushed malt with water. Then the malt adjuncts which are in water at about 100 °C after boiling or cooking under steam pressure are added. This brings the temperature of the resulting cereal-malt-mash to about 70 °C. At this temperature production of sugars from the starch takes place within a short time. Then the temperature is in-creased to about 75 °C which inactivates the enzymes. Insoluble materials that settle to the bottom of the container serve as a filter, so that the liquid that emerges, called wort, is clear. Rinsings from the filtering material are added to the wort. Next hops are added to the wort to constitute the liquid from which the final wort is prepared for fermentation. Some of the mashing procedures and the mash itself may be substituted for in more advanced processes by using partially hydrolysed syrups derived from corn or barley.

Next the liquid containing wort and hops is boiled for about 2.5 hours, after which it is filtered through the hop residues. In this way the hop solids and precipitated proteins are removed. The precipitate

is washed with hot water to remove most of the soluble material, the mashing being added to the original filtrate. The resultiug wort is ready for fermentation.

A special beer yeast is added to the cooled wort. The temperature of the wort during the fermentation is low, usually being in the range from 5.3 to 14 °C. The fermentation is complete within 8 to 14 days, usually in 8 to 10 days. During this process the yeast converts the sugar in the wort chiefly to alcohol and carbon dioxide, plus small amounts of glycerol and acetic acid. Proteins and fat derivatives yield small amounts of higher alcohols and acids, the latter combine to form aromatic esters. At a later stage the yeasts flocculate and settle. Bacterial growth is not desired during the fermentation and the subsequent aging of the beer.

The young or «green» beer is stored in vats at about 0 °C from several weeks to several months, during this period precipitation of proteins, yeasts and other undesirable substances taking place and the beer becoming clear and matured.

After aging the beer is carbonated to a carbon dioxide at about 0.45 to 0.52 per cent, mostly by means of gas collected during the fermentation. Then the beer is cooled, clarified or filtered, and packaged is bottles, cans or barrels. The alcohol content is about 3.8–5 per cent by weight. The beer for cans or smaller bottles is pasteurized briefly at about 60 °C or filtered through membranes or other materials to remove all yeasts.

EXERCISES

1. Find the derivatives of the following words in the text:

carbon, act, solution, desire, clear, germ, air.

2. Form the names of processes from the given verbs. Translate them into Russian:

to malt, to ferment, to mash, to mix, to boil to settle, to filter, to precipitate, to wash, to cool, to age, to clarify, to carbonate, to package, to pasteurize, to germinate, to wet, to brew, to bottle, to aerate.

3. Translate into English:

пиво, пивоварение, напиток, ячмень, солод, получение солода, хмель, росток, солодовая добавка, прорастать, размельчать (размалывать), солодовый затор, сусло, осадок, уксусная кислота, сложный эфир, выпадать хлопьями, созревший (выдержанный), созревание, насыщать углекислым газом, очищать, фильтрование, мембрана, осаждаться.

V. Sentence connection. Remember some of the words often used in scientific literature to connect sentences and translate the following sentences:

for – /союз/ – ибо, так как (показывает, что сказанное есть причина того, что упомянуто выше);

the former... the latter – первый (из двух упомянутых)..., последний (из двух упомянутых) – средство выделить одну или другую группу существительного в предыдущем предложении;

hence – отсюда, в результате (означает закономерность последующего утверждения);

however – однако, тем не менее (обозначает неожиданный поворот в ходе рассуждений);

otherwise – иначе, другими словами (показывает, что то, что было выражено в предыдущем предложении, может быть передано иным способом);

therefore – поэтому, следовательно (указывает, что последующее предложение есть результат того, что сказано выше);

thus – таким образом (обычно указывает на связь между предложениями или членами предложения).

1. Fermentation is much influenced by wort composition. Since the latter is affected by the metods and materials used in its production, it is necessary to provide a description of the processes involved. 2. Hence, in practice a product should be sterilized so that under normal conditions it will neither spoil nor endanger the health of the consumer. 3. Since only soluble substances can pass into beer, it is, therefore, necessary to convert the insoluble materials into doluble ones during mashing. 4. However,

brewers, bakers, cheese makers relied on enzyme activity at various stages of manufacture despite their lack of knowledge of enzymes. 5. The fermentation step is catalysed principally by yeast. The latter may be a pure monoculture or a mixture of yeast strains. 6. Thus, food technology has not been static – in fact, advances and improvements have followed one another with such speed that it has been difficult to keep up with them. 7. Food storage, transportation and distribution cannot take place without refrigeration and freezing, for these processes play a decisive role in optimal preservation of perishable foods. 8. However, because yeast stores most of the valuable vitamin B1, it is more healthy to drink unfiltered, yeast-containing beer. 9. To prevent various undesirable changes food must be preserved properly, otherwise it will deteriorate and lose its nutritive value. 10. Therefore, it should be possible to produce an alcohol-free beer using a combination of high temperature mashing and cold contact fermentation. 11. The malt adjuncts are starch- or sugar-containing materials, the former including corn, wheat, rice and others, the latter being mainly sugar and syrups.

LANGUAGE PRACTICE UNITS 13–19

Comprehension:

Revise texts 15–18 and choose the correct answer:

1. The most reliable method of meat preservation is;

A) adding of chemical preservatives;

B) deep freezing;

C) smoking;

D) pickling.

2. In preservation of vegetables and fruit too high relative humidity results in:

A) loss of moisture;

B) removing odors;

C) the growth of spoilage microorganisms;

D) loss of weight.

3. Addition of acids for fish preservation is used for:

A) air removal by vacuum;

B) discoloration;

C) elimination of oxygen;

D) inhibition of toxin-producing bacteria.

4. Staling of bread is associated with:

A) mold growth;

B) changing in the starch;

C) addition of emulsifying agent;

D) moisture condensation.

Speaking:

Choose a topic and discuss it in a group.

1. Heat treatment of milk and dairy products.

2. Principles and application of hurdle technology.

3. Breadmaking technological processes.

Speaking tips:

– Take everyone’s point of view into account.

– Don’t speak about too many things.

– Choose one or two facts you know well and give examples.

– Use your own ideas.

Helpful phrases:

– As far as I know...

– Don’t you know...?

– I would like to add...

– Well, I totally agree with you...

– Don’t you think...?

– Have you heard...?

– May I just cut in here...

Writing:

Revise the texts 14–16 and write a report on the topic: «Food preservation methods used for dairy, meat and fish products».

VOCABULARY

A

ABUNDANCE (n) – изобилие
ACCEPT (v) – принимать, допускать
ACCEPTIBILITY (n) – приемлемость
ACCESS (n) – доступ
ACCOMPLISH (v) – выполнять, осуществлять
ACID (n) – кислота
acetic ~ уксусная кислота
amino ~ аминокислота
ascorbic ~ аскорбиновая кислота
bensoic ~ бензойная кислота
citric ~ лимонная кислота
fatty ~ жирная кислота
lactic ~ молочная кислота
nicotinic ~ никотиновая кислота
nucleic ~ нуклеиновая кислота
phosphoric ~ фосфорная кислота
propionic ~ пропионовая кислота
sorbic ~ сорбиновая кислота
ACTIVATE (v) – активировать
AGING (n) – созревание, выдерживание
AIRTIGHT (a) – непроницаемый для воздуха
ACIDIFICATION (n) – подкисление
ADDITIVE (n) – добавка
ADJUNCT (n) – добавка
malt ~ солодовая добавка
AGGRAVATE (v) – ухудшать, усиливать
AIRTIGHT (a) – воздухонепроницаемый
ALTER (v) – изменять(ся)
ALTERATION (n) – изменение, перестройка
ALTERNATIVE (a) – другой, (n) выбор из двух

AMBIENT (n) – окружающая среда
ANTIBODY (n) – антитело
ANTIOXIDANT (n) – антиоксидант
ASSIMILATE (v) – усваивать
ASSIMILABILITY (n) – усвояемость
AQUEOUS (a) – водяной, водный

B

BACTERIUM (n) – бактерия
aerobic ~ аэробная бактерия
anaerobic ~ анаэробная бактерия
pathogenic ~ патогенная (болезнетворная) бактерия
BAKE(v) – печь
BAKERY (n) – пекарня, булочная
BALANCE (v) – уравновешивать
BALLS (meat) – мясные фрикадельки
BARLEY (n) – ячмень
BARREL (n) – бочка
BATCH PROCESS – периодический процесс
BEEF (n) – говядина
BEER (n) – пиво
BENEFIT (n) – преимущество, польза
public ~ польза для общества
nutritional ~ питательность
BENZOATE (n) – соль бензойной кислоты
BEVERAGE (n) – напиток
BREEDING (n) – размножение, выведение
maker-assistant ~ зд. искусственное осеменение
BLANCH (n) – бланшировать
BLOODSTREAM (n) – кровообращение
BORAX (n) – бура (пироборнокислый натрий)
BOTTLING (n) – розлив в бутылки
BRAN (n) – отруби

BREADMAKING (n) – хлебопечение
BREAKDOWN (n) – распад
BREWERY(n) – пивоваренный завод
BREWING (n) – пивоварение
BRITTLE (a) – хрупкий
BROWNING (n) – побурение, потемнение
BUCKLE (v) – вспучиваться
BULK (n) – масса, объем
in bulk – без тары, навалом, наливом
BUTTERFAT(n) – молочный жир
BUTTERMAKING (n) – маслоделие

C

CAN(v) – консервировать
CANNING(n) – консервирование
CARBOHYDRATE (n) – углевод
CARBON (n) – углерод
CARBON DIOXIDE – углекислый газ
CARBONATE (v) – газировать, насыщать газом
CATALISIS (n) – катализ
CATALYST (n) – катализатор
CAUSE (v) – вызывать, быть причиной, заставлять
CELL (n) – клетка
mammalian ~ клетка млекопитающихся
CELLULAR (a) – клеточный
CENTER (v) – концентрировать(ся), сосредоточивать(ся)
CEREAL (n) – хлебный злак, зерно, крупа
CHAIN (n) – цепь
cold ~ холодильная цепь (непрерывность охлаждения при хранении, транспортировке и реализации)
CHEESE-MAKING (n) – сыроделие
CHEMICAL (n) – препарат, химикат
CHLORIDE (sodium) – хлористый натрий

CHLORINE (n) – хлор

CHLORINATION (n) – хлорирование

CHURN (v) – мешать, взбалтывать, взбивать

CLARIFY (v) – очищать, осветлять

COMPOSITION (n) – состав

COMPOUND (n) – соединение

CONDUCTIVITY (n) – проводимость

CONFECTIONARY (n) – кондитерская фабрика, конфета

CONFECTIONERY (n) – кондитерская (или изделия), искусство кондитера

CONSTITUENT (n) – составная часть, элемент

CONSUME (v) – потреблять

CONSUMER (n) – потребитель

CONSUMPTION (n) – потребление

CONTAIN (v) – содержать

CONTAMINATION (n) – заражение, инфицирование

CONTENT (n) – содержание

CONTINUOS SYSTEM – система непрерывного действия

CONVENTIONAL (a) – обычный, традиционный, общепринятый

COOK (v) – подвергать тепловой обработке, варить, готовить пищу

CORN (n) – кукуруза

CREAM (n) – сливки

CRUSH (v) – дробить, измельчать, перетирать

CURING (n) – консервирование, вяление, посол

CURRENT (electric) – электрический ток

D

DAIRY(a) – молочный

~ dessert – сладкое молочное блюдо

DECAY (v) – затухать, уменьшаться, разлагаться

DECOMPOSITION (n) – распад, разрушение

DEFICIENCY (n) – недостаток, отсутствие

DEFROST (v) – размораживать
DEHYDRATION (n) – обезвоживание
DELAY(v) – задерживать, препятствовать
DELICATE (a) – хрупкий, нежный
DEMAND (n) – спрос
DENATURATION (n) – денатурация
DEPLETION (n) – исчерпывание, истощение
DERIVE (v) – происходить, получать
DETERIORATION (n) – ухудшение, порча
DEVELOPER (n) – тестомесильная машина
DIASTASE (n) – диастаза
DIET (n) – питание, рацион питания
DIETETIC (a) – диетический
DIGESTIBLE (a) – перевариваемый
DIOXIDE (n) – двуокись
DIP (v) – погружать, окунать
DISCARD (v) – выбрасывать, выводить
DISPERSE (v) – диспергировать, рассеивать(ся)
DISPLAY (n) – выставка (продуктов, товаров)
DISPLAY CABINET (n) – охлаждаемая витрина
DISRUPT (v) – разрывать, разрушать
DISSOLVE (v) – растворять(ся)
DISTRIBUTION (n) – распределение
DIVIDER (n) – тестоделительная машина
DOUGH (n) – тесто
DRESSING (n) – приправа, соус
DROP (v) – падать, понижаться
DRYING (n) – сушка
freeze ~ сублимационная сушка
roller ~ вальцовая (барабанная, пленочная) сушка
spray ~ сушка распылением
tunnel ~ туннельная сушка
DRUM (n) – барабан

E

EDIBLE (a) – съедобный
EMERGENCY (n) – непредвиденный
EMISSION (n) – излучение, эмиссия электронов
EMULSIFIER (n) – эмульгатор
ENHANCE (v) – увеличивать, усиливать
ENHANCEMENT (n) – интенсификация
ENZYME (n) – фермент
hydrolytic ~ гидролитический
ESTER (n) – сложный эфир
ETHANOL (n) – этанол, этиловый спирт
EVACUATION (n) – откачивание воздуха, вакуумироваине
EVAPORATION (n) – испарение
flash ~ мгновенное испарение
EXCESS (n) – избыток
EXHAUST (v) – откачивать, выпускать, эксгаустировать
EXHAUST BOX – эксгаустер
EXHAUSTION (n) – истощение, исчерпывание
EXPOSE (v) – подвергать воздействию
EXPOSURE (n) – воздействие, выдержка, облучение, контакт
EXTRACT (n) – экстракт (извлекать)
flavoring ~ вкусовой (ароматический) экстракт; приправа, специя

F

FACILITIES – средства, устройства, приспособления, оборудование
FANGUS (pl. fungi) (n) – гриб, грибок
FAVOR (v) – благоприятствовать, способствовать
FAT (n) – жир
FERMENT (n) – фермент
FERMENTATION (n) – брожение
FERTILIZER (n) – удобрение
FILLING (n) – наполнение, розлив

aseptic ~ асептический розлив

FILM (n) – пленка

FINE (a) – мелкий, тонкий

FISHING (n) – рыболовный промысел

FISSION (n) – расщепление

FLASH (n) – вспышка

FLAVOR (n) – вкус

burnt ~ пригорелый вкус

FLESH (n) – мясо

FLOCCULATE (v) – выпадать хлопьями

FLOUR (n) – мука

FLUORINE (n) – фтор

FOOD (n) – пища, еда, пищевой продукт

infant ~ продукт детского питания

functional ~ функциональные пищевые продукты

~ preservation – сохранение, консервирование пищевых продуктов

~ processing – технология производства (обработки) пищевых продуктов

~ process engineering – техника пищевых процессов

~ science – наука о пищевых продуктах

sea ~ морепродукты

~ technology – пищевая технология, технология пищевых продуктов

FREEZING (n) – замораживание

blast ~ замораживание в интенсивном потоке воздуха

fluidized bed ~ замораживание в псевдоожиженном слое

immersion ~ замораживание погружением в жидкую холодную среду

plate ~ контактное замораживание

FURNISH (v) – снабжать, доставлять

G

GENE (n) – ген

GENETIC (a) – генетический

GENOME (n) – геном, совокупность генов

GERM (n) – росток

GERMINATE (v) – прорастать

GLOBULE (fat) – жировой шарик (молока)

GLYCEROL (n) – глицерин

GMO (genetically modified objects) – модифицированные объекты

GRADE (v) – сортировать, классифицировать

GRIND (GROUND) (v) – молоть

H

HAM (n) – ветчина

HANDLING (n) – обработка, переработка, транспортирование

HARM (v) – вредить

HARVEST (n) – урожай, (v) – убирать урожай

HEALTHFULNESS (n) – полезность

HEALTHCARE (т) – охрана здоровья, здравоохранение

HEAT-RESISTANT (a) – теплостойкий

HERRING (n) – сельдь

HINDER (v) – препятствовать, мешать

HOMEOSTASIS (n) – гомеостаз, постоянство состава систем

HOMEOSTATIC (a) – гомеостатический

HOMOGENIZE (v) – гомогенизировать

HOP (n) – хмель

HURDLE (n) – барьер, препятствие; фактор, регулирующий развитие микроорганизмов

HURDLE EFFECT – препятствующий эффект

HURDLE TECHNOLOGY – барьерная технология

HYPOCHLORITE (n) – гипохлорит

I

IMPACT (n) – воздействие
INCIDENCE (n) – распространение
desease ~ заболеваемость
INDICATION (n) – показание (прибора)
INDICATOR (n) – индикатор, указатель, счетчик
INHERENT (a) – присущий, свойственный
INJECTION (n) – впрыскивание
steam ~ впрыскивание пара
INFERIORITY (n) – более низкое качество
INHIBIT (v) – замедлять, подавлять, тормозить
INOCULATE (v) – искусственно засевать микроорганизмами
INTAKE (n) – потребление, поглощение
INTERFERENCE (n) – взаимное влияние, интерференция
INTERCELLULAR (a) – межклеточный
IODINE (n) – йод
IRRADIATION (n) – облучение
IRREVERSIBILITY (n) – необратимость

K

KEEPING QUALITY (n) – стойкость
KIDNEYS (n) – почки
KNEAD (v) – месить (тесто)

L

LABELING (n) – маркировка
LACK (n) – недостаток, нехватка
LAG (v) – отставать
LAMB (n) – барашек, молодая баранина
LARD (n) – свиное сало
LAYER (n) – слой
LEAKAGE (n) – утечка
LEAN (a) – тощий, скудный

LEGAL (a) – юридический
LEGUME (n) – боб, растение из семейства бобовых
LETTUCE (n) – салат-латук
LID (n) – крышка
LIPID (n) – липид, жир
LIQUOR (n) – напиток, жидкость, раствор
LIVER (n) – печень
LOAD (microbial) – количество бактерий
LOAF (n) – батон, буханка, булка

M

MAGNETIC (a) – магнитный
MALNUTRITION (n) – недостаточное, неправильное питание
MALT (n) – солод
MALTING (n) – соложение, получение солода
MALT MASH (n) – солодовый затор
MASH (n) – затор, (v) – затирать солод
cereal malt ~ зерновой солодовый затор
MASHING (n) – разварка, затирание солода
MATURE (v) – созревший
MESH (n) – сетка
METABOLISM (n) – обмен веществ
METHOD (n) – метод, способ
HTST ~ высокотемпературный кратковременный метод
LTST ~ низкотемпературный долговременный метод
holding ~ метод выдержки; способ длительной пастеризации
UHT ~ метод пастеризации при очень высокой температуре
MICROWAVE (a) – микроволновый
MILD (a) – мягкий, слабый
MILK (n) – молоко
dried (powder) ~ сухое молоко
evaporated ~ сгущенное пастеризованное молоко (без сахара)
market ~ питьевое молоко

skim ~ обезжиренное (снятое) молоко
sweetened condensed ~ сгущенное молоко с сахаром
whole ~ цельное молоко
MILKING (n) – доение
MILL (v) – размалывать, (n) мельница
MOLD (n) – плесень, форма, формовка
MOLD (v) – плесневеть, формовать
MULTITARGET (a) – многоцелевой
MUSCLE TISSUE – мышечная ткань
MUTTON (n) – баранина

N

NATIVE (a) – природный, чистый
NITROGEN (n) – азот
NITROGENUOUS (a) – азотный, азотистый
NONTHERMAL (a) – нетепловой, нетермический
NOVEL (a) – новый
NUCLEUS(n) – ядро
NUT(n) – орех
NUTRIENT (n) – питательное вещество
NUTRITIONIST (n) – диетолог
NUTRITIVE (a) – питательный
NUTRITIVE VALUE – питательная ценность

O

OATS (n) – овес
OBTAIN (v) – получать
ODOR (n) – запах
OFF-FLAVOR (n) – посторонний привкус
OFF-FLAVORS (n) – пороки вкуса
OIL (n) – масло, жир
animal ~ жидкий (топленый) животный жир
vegetable ~ растительное масло

OLIVE (n) – маслина
ONION (n) – лук
ORGANOLEPTIC (a) – органолептический
OSCILLATING(a) – колебательный, вибрирующий
OVEN (n) – хлебопекарная печь
OVERCOME (v) – преодолевать
OVERCOOKING (n) – переваривание, пережаривание
OVERSOFTENING (n) – слишком большое размягчение
OXIDIZE (v) – окислять

P

PACKAGING (n) – упаковка, упаковывание
modified atmosphere ~ упаковка в газовой атмосфере регулируемого состава
PALATABLE (a) – вкусный
PANEER (n) – панир (кисломолочный продукт)
PASTA (n) – макаронные изделия
PASTEURIZATION (n) – пастеризация
PATHOGENIC (a) – патогенный, болезнетворный
PATTERN (n) – образец
~ consumption – тип, структура потребления
PATTY (n) – брикет из мясного фарша, котлета
PEANUT (n) – арахис
PEEL (n) – корка, кожица, шелуха
PERISHABLE (a) – скоропортящийся
PICKLE (v) – мариновать
PINEAPPLE (n) – ананас
POISON (v) – отравлять
PORK (n) – свинина
POROUS (a) – пористый
POTASSIUM (n) – калий
POWDER (v) – толочь, превращать в порошок (пудра, порошок)
PRECIPITATION (n) – осаждение

PRESERVATIVE (n) – консервант
PRESSURE (n) – давление
hydrostatic ~ гидростатическое давление
PRODUCT (n) – продукт
long-life ~ долго сохраняющийся продукт
PROCESS (v) – обрабатывать
PROOF (n) – расстойка (теста)
intermediate ~ промежуточная расстойка
PROTECTION – защита
environmental ~ защита окружающей среды
PROTEIN (n) – белок
~ sparing экономия белка
PROTEINACEOUS (a) – белковый
PUFFING (n) – вспучивание, вздувание
PULSED (PII) – импульсный
PUREE (n) – пюре

R

RANCIDITY (n) – прогорклость, прогорклый вкус
RADIATION (ionizing) – ионизирующее излучение
RAW MATERIAL (n) – сырьё
RECORDER (n) – записывающее устройство, регистрирующий прибор
REDOX POTENTIAL – окислительно-восстановительный потенциал
REFINE (v) – очищать, рафинировать
RELISH (n) – приправа
REMOVE (v) – отводить, удалять
REQUIRE (v) – требовать
RESIDUE (n) – осадок
RESTICT (v) – ограничивать
RETAIL (n) – розничная продажа
~ display – выставка товара, витрина

RETARD (v) – задерживать, замедлять
RETENTION (v) – задержание
REVERSIBILITY (n) – обратимость
RIGOROUS (a) – строгий (о режиме процесса)
RINSE (v) – промывать, ополаскивать
RIPE (a) – зрелый
RIPEN (v) – созревать
ROUNDER (n) – тестоокруглительная машина
RUST (v) – ржаветь
RYE (n) – рожь

S

SAFE (a) – безвредный
SAFETY (n) – безопасность, безвредность
SATISFY (v) – удовлетворять
SAUERCRAUT (n) – кислая капуста
SAUSAGE (n) – колбаса
SAVING (n) – экономия
SCRAP (v) – скоблить, скрести
SEAFOOD (n) – морепродукты
SEAL (v) – закатывать, запечатывать, закупоривать
SEED (n) – семя
SENSORY (a) – чувствительный
SHELF-LIFE (n) – сохраняемость
SHRINKAGE (n) – усушка, усадка
SLAUGHTER (n) – убой (скота)
SLICE(v) – резать, (n) – ломтик
SMELL (n) – запах
SMOKING (n) – копчение
SOAK (v) – вымачивать
SOFTEN (v) – размягчаться
SOLDER (n) – припой
SOLIDS (n) – сухие вещества

non-fat milk ~ сухое обезжиренное молоко
SOLUBILITY (n) – растворимость
SOLVENT(n) – растворитель
SORBATE (n) – сорбат
SORT (v) – сортировать
SODIUM (n) – натрий
SPECIES (n) – вид, разновидность
SPICE (v) – добавлять пряности
SPINACH (n) – шпинат
SPOIL (v) – портить(ся)
SPOILAGE (n) – порча
SPONGY (a) – рыхлый
SPORE (n) – спора
STABILITY (n) – стойкость
STABILIZER (n) – стабилизирующее вещество
STALE (a) – черствый, затхлый
STARCH (n) – крахмал
STARTER (n) – закваска
STEAM (n) – пар
saturated ~ насыщенный пар
STERILIZATION (n) – стерилизация
STICKY (a) – липкий
STOMACH (n) – желудок
STORAGE (n) – хранение, хранилище, склад
chilled ~ (n) – хранение в охлажденном состоянии
cold ~ (n) – холодильное хранение
frozen ~ (n) – хранение в замороженном состоянии
SUBLETHAL (a) – почти летальный, близкий к смертельному
SUBLIME (v) – сублимировать, возгонять
SUBSTANCE (n) – вещество, субстанция
SUGAR (n) – сахар
~ BEET (n) – сахарная свекла
~ CANE (n) – сахарный тростник

SULFITE (n) – сульфит
SULPHUR (n) – сера
SYNERGISTICAL (a) – синергетический, сопутствующий
SYNERGISTISM (n) – усиливающее действие
SURVIVE (v) – выжить, продолжать существовать
SYRUP (n) – сироп
soda-fountain ~ сироп для содовой газированной воды
SUSCEPTIBLE (a) – восприимчивый, чувствительный

T

TAKE OUT (v) – выводить
TALLOW (n) – топленый жир, сало
TARGET (n) – объект, цель
TASTE (n) – вкус
TECHNIQUE (n) – техника, технический прием, способ, метод
TEXTURE (n) – структура, строение
THAW (v) – таять
TlSSUE (n) – ткань
adipose ~ жировая ткань
epithelial ~ эпителиальная ткань
TOOL (n) – инструмент
TRACE (n) – незначительное количество
TRACE METAL (n) – микроэлемент
TRAP (v) – улавливать, захватывать
TRAWLER (n) – траулер
TRAY (n) – поднос, лоток, противень, поддон

U

ULTRAVIOLET (a) – ультрафиолетовый
ULTRAZONIC (a) – ультразвуковой
UNDERGO (v) – подвергать(ся)

V

VACREATION (n) – вакреация (пастеризация молока в вакууме)
VANILLA (n) – ваниль
VAT (n) – чан
VEGETATIVE (a) – растительный, вегетативный
VEHICLE (n) – средство перевозки (доставки)
VENT-HOLE (n) – вентиляционное отверстие
VINEGAR (n) – уксус
VISION (a) – зрение
VITALITY (n) – жизнеспособность, живучесть
VITAMIN (n) – витамин
fat-soluble ~ жирорастворимый витамин
water-soluble ~ водно-растворимый витамин
VOID (n) – пустота

W

WASTE (n) – отходы
WAVE (n) – волна
WAX (n) – воск
WEED (n) – водоросль
sea ~ морская водоросль
WHEAT (n) – пшеница
WHIP (v) – взбивать
WHOLESOME (a) – полезный
WHOLESOMENESS (n) – полезность
WITHSTAND (v) – выдерживать, противостоять
WILT(v) – увядать
WORT (n) – сусло
WRAP (v) – обертывать, заворачивать

Y

YEAST (n) – дрожжи
YOLK (n) – желток
YOGHURT (n) – йогурт

СПИСОК ЛИТЕРАТУРЫ

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