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КАФЕДРА ИНОСТРАННЫХ ЯЗЫКОВ

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Профессиональный иностранный язык

Учебное пособие
для студентов направления подготовки
19.03.03 Продукты питания животного происхождения
профиль: Технология мяса и мясных продуктов



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Учебное пособие представляет собой курс профессионального английского языка, основной целью которого является развитие умений изучающего, ознакомительного, просмотрового, поискового чтения, перевода, овладение терминологией, а также формирование навыков монологической и диалогической речи, навыков аннотирования и реферирования специализированных текстов.

Пособие содержит тексты из области технологии переработки сырья и производства мяса, мясных и молочных продуктов. Также представлены тексты для дополнительного чтения.

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Предисловие

Данное учебное пособие предназначается студентам, обучающимся по направлению подготовки 19.03.03 Продукты питания животного происхождения специальности и изучающим дисциплину «Профессиональный иностранный язык» а также интересующимся проблематикой устной и письменной коммуникации на английском языке в ее непосредственной связи с переводом в сфере агропромышленного комплекса, что способствует мотивации студентов и стимулирует их к работе над иностранным языком.

Основной целью обучения студентов является приобретение коммуникативной компетенции, необходимой для квалифицированной информационной и творческой деятельности в различных сферах. Обязательным условием достижения поставленной цели является решение следующих задач:

- овладение всеми видами чтения и перевода специализированной литературы;
- овладение всеми видами монологического высказывания (информирование, пояснение, уточнение, инструктирование и иллюстрирование высказывания, а также умение сделать сообщение на иностранном языке);
- развитие навыков понимания высказываний профессионального характера, обмена профессионально-значимой информацией;
- развитие навыков аннотирования и реферирования текстов профессиональной направленности.

Данное учебное пособие построено с учётом преемственности обучения и состоит из самостоятельных блоков (Units).

Цель каждого блока - развитие умения чтения и адекватного перевода текстов по направлению подготовки и написания тезисов, докладов, рефератов и аннотаций.

После каждого блока имеются лексические упражнения, которые направлены на обучение не только чтению различных видов (изучающего, ознакомительного, просмотрового и поискового), но и коммуникативным навыком.

UNIT 1. AGRICULTURE

Прочитайте и переведите текст

Text 1. What is agriculture?



Agriculture is an important branch of economy. Economic growth of any country depends on the development of agriculture, which supplies people with food and clothing and industry with raw materials.

The word "agre" is a Latin word. It means the cultivation of fields in order to grow crops. Now agriculture also includes the use of land to breed farm animals.

We do not know when people began to grow crops. It was many thousand years ago. Now crop production and animal husbandry are highly developed branches of agriculture.

Life is impossible without plants. They play a highly, important role in everyday life of people. Plants that are grown by farmers are known as farm crops. They are used for many different purposes. Most of them are used directly as food for people, some are consumed by farm animals, others are used in industry and medicine.

In order to increase crop yields and animal products our collective and state farms apply widely intensive technologies.

1. Выучите слова

agriculture – сельское хозяйство

animal – животные

apply - применять

breed – разводить

crop - культура

cultivation – обработка

development – развитие

farm – ферма, хозяйство

food – пища

grow – расти, выращивать

growth –рост

increase – увеличение

plant – растение

supply – снабжать

use – использовать

yield – урожай

2. Назовите эквиваленты к следующим интернациональным словам

Tractor, combine, bulldozer, industrial, region, climate, machine, to mechanize, tendency, tradition, traditional.

3. Ответьте на следующие вопросы

1. Why is agriculture very important?
2. What does the Latin word "agre" mean?
3. What are the two branches of agriculture?
4. Is life possible without plants?
5. Where are farm crops used?
6. How do people increase crop yields?

4. Прочитайте и переведите текст:

Text 2. Characteristics of Agriculture

Agriculture is considered to be art, science, and industry of managing the growth of plants and animals for human use. In a broad sense agriculture comprises the entire range of technologies associated with the production of useful products from plants and animals. It also includes soil cultivation, crop and livestock management, dairying and forestry, and the activities of processing and marketing.

In this light, agriculture encompasses the whole range of economic activities involved in manufacturing and distributing the industrial inputs used in farming; the farm production of crops, animals and animal products; the processing of these materials into finished products; and the provision of products at a time and place demanded by consumers. Many different factors influence the kind of agriculture practiced in a particular area. Among these factors are climate, soil, topography, nearness to markets, transportation facilities, land costs, and general economic level.

Climate, soil, water availability vary widely throughout the world. This variation brings about a wide range in agricultural production enterprises. Certain areas tend toward a specialized agriculture, whereas other areas in a more diversified one.

As new technology is introduced and adopted, environmental factors are less important in influencing agricultural production patterns. Continued growth in the world's population makes critical the continuing ability of agriculture to provide the needed food and fiber.

Agriculture changes through scientific discoveries and new technology. Agriculture depends heavily on the fields of engineering and technology and on the biological and physical sciences. Irrigation, drainage, conservation, and sanitation – each of which is important in successful farming - are some of the fields requiring the specialized knowledge of agricultural engineers. Agricultural chemistry deals with other vital farm problems, such as uses of fertilizer, insecticide, and fungicide, soil make up, analysis of farm products, and nutritional needs of farm animals. As it is known science contributes a lot to agriculture. Plant breeding contributes immeasurably to farm productivity. Genetics has also placed livestock breeding on a

scientific basis. Physics has helped us to develop machines and power for use in farming. Man's knowledge of breeding has enabled him to develop hundreds of new varieties of field crops superior in many ways to the older ones.

5. Найдите в тексте английские эквиваленты следующих сочетаний

Сельскохозяйственные животные, факторы окружающей среды, на предприятиях сельскохозяйственного производства, научные открытия, производство полезных продуктов, производство и распределение, селекция растений, специальные знания, сельскохозяйственные продукты, специализированное сельское хозяйство, новые разновидности сельскохозяйственных культур, дать возможность, экологические факторы, необходимая пища и волокно.

6. Прочитайте, переведите и перескажите текст

Text 3. Agriculture in the United Kingdom

Agriculture in the United Kingdom uses around 71% of the country's land area and contributes about 0.6% of its gross value added. The UK produces less than 60% of the food it eats and the industry's share of the national economy is declining. Despite skilled farmers, high technology, fertile soil and subsidies, which primarily come from the European Union, farm earnings are low and falling, mainly due to low prices at the farm gate. With each generation, fewer young people can afford the increasing capital cost of entry into farming and more are discouraged by low earnings. The average age of the British farm holder is now 59. Recently there have been moves towards organic farming in an attempt to sustain profits, and many farmers now supplement their income by diversifying activities away from pure agriculture. Now, biofuels present new opportunities for farmers against a background of rising fears about fossil fuel prices, energy security, energy sustainability, and climate change. There is increasing awareness that farmers have an important role to play as custodians of the British countryside and wildlife. The high cost of entry into farming presents a significant barrier. Land prices in the United

Kingdom are high. Local authorities recognize this and some offer smallholdings intended to allow those with skill or training but little capital to set up as tenant farmers. Nevertheless, this provision is shrinking and there is an increasing shortage of farmland to let. The total area on agricultural holdings is about 17.1 million hectares (43 million acres), or 18.3 million including rough grazing land, of which 6.2 million hectares (15.3 million acres) are crop able. During the growing season about half the crop able area is devoted to cereal crops, and of the cereal crop area, more than 65% is wheat. There are about 31 million sheep, 10 million cattle, 9.6 million poultry and 4.5 million pigs. These are arranged on almost 327,000 agricultural holdings, on which the average farmable area is around 54 hectares (130 acres) each. About 70% of farms are owner-occupied or mostly so, the remainder being tenant farmers. Farmers represent an ageing population, partly due to low earnings and barriers to entry, and there are ongoing difficulties in recruiting young people into farming. The average farm holder is now 59 years old. British farming is intensive and highly mechanized, but the country is so heavily populated that it cannot supply its own food needs. The United Kingdom is a net importer of food, producing only 59% of the food it consumes.

7. Назовите эквиваленты следующих интернациональных слов

Grazing land, population, independent farms, smallholdings, tractor, gross value added, organic farming, biofuels, agriculture, crop able, arranged.

8. Переведите на английский вопросы и ответьте на них.

- 1) Какой возраст у среднестатистического фермера в Великобритании?
- 2) Сколько сельхоз угодий в Великобритании?

9. Прочитайте, переведите и задайте вопросы к тексту

Text 4. Two branches of agriculture.

There are two main branches of agricultural production - crop production and animal husbandry.

Crop production is the practice of growing and harvesting crops. The most important crops grown by man are grain crops, vegetables and grasses. In order to obtain high yields crops are grown under favorable soil and climatic conditions.

Animal husbandry is a branch of agriculture including the breeding of farm animals and their use. Dairy and beef cattle, hogs, sheep, and poultry are widely bred throughout the world. Farm animals are highly important sources of food for man. They are kept for the production of such nutritious products as meat, milk and eggs.

Many crops grown by man are used in feeding livestock. At the same time manure produced by farm animals is an important source for the maintenance of soil fertility. Most of the nutrients taken by plants from the soil are thus returned. Applying manure, farmers improve the physical condition of the soil.

Thus, crop production and animal husbandry are closely connected with each other.

Explanations to the text:

Under... conditions – при (в) ... условиях

With each other – друг с другом

10. Выучите слова

grass - трава

hog - свинья

improve - улучшать

to keep – содержать

beef cattle - мясной скот

dairy cattle – молочный скот

favourable - благоприятный

grain - зерно

manure - навоз

meat – мясо

to produce - производить

soil fertility – плодородие почвы

nutrient – питательное вещество

poultry – домашняя птица

11. Прочитайте и перескажите текст

Text 5. Russian agriculture

The agriculture has been and remains a very important sector of Russian economy. Many of our agriculture products are well known in other countries. Russia can cultivate practically all known farm crops due to various climatic parameters on its large territory. Our country cultivates different kinds of cereals (rye, oats, wheat, barley, maize, etc.), vegetables (potatoes, beets, carrots, tomatoes, onions, cucumbers, cabbage, etc.), fruits (apples, pears, plums, peaches, etc.) and very many kinds of berries.

Animal breeding is a very important field of our agriculture. Cattle farming and poultry farming give us various kinds of meat (beef, lamb, pork, turkey, etc.), eggs and milk.

The modern agriculture in Russia has many critical problems. The deficit of agricultural machinery belongs to the most difficult problems. The condition of agricultural machinery in Russia is very poor and the high cost makes the rate of its replacement weak and slow. But the citizens of Russia believe that the Russian agriculture will solve all existing problems in the future.

12. Прочитайте тексты 6 и 7 и подготовьте их аннотации по образцу

The plan for rendering the text	Some expressions for rendering the text
I. The title of the article (text)	The title of the article (text) is ... The article (text) is headlined (entitled) ... The head-line of the article (text) I have read is ... The text / article under review ... (gives us a sort of information about...) The article deals with the problem... The subject of the text is...

II. The author of the article, where and when the article was published	<p>The author of the article (text) is ...</p> <p>The article (text) is written by ...</p> <p>It is (was) published in ...</p> <p>It is (was) printed in ...</p>
III. The main idea of the article (text)	<p>The main idea of the article (text) is ...</p> <p>The article (text) is about ...</p>
IV. Contents, some facts, names, figures	<p>The author writes about (touches on the problem, describes, underlines, mentions ...)</p> <p>The author describes ...</p> <p>(dwells on ...; explains ...; touches upon ...; analyses ...; comments ... ; characterizes ... ; underlines ... ; reveals ... ; gives account of...)</p> <p>The article begins with the description of..., a review of..., the analysis of...</p> <p>In the first (next, last) part we read about ...</p> <p>At the beginning of the text, we read about...</p> <p>The article opens with...</p> <p>The article (text) is devoted to ...</p> <p>The article (text) deals with ...</p> <p>Great attention is paid to ...</p> <p>The article touches upon ...</p> <p>There are some interesting details of ...</p> <p>Then (after that, further on, next) the author passes on to ..., gives a detailed (thorough) analysis (description), goes on to say that...</p>
V. The conclusion of the author	<p>To finish with, the author describes...</p> <p>At the end of the article the author draws the conclusion that ...;</p> <p>the author sums it all up (by saying ...)</p> <p>In conclusion the author writes...</p> <p>The author comes to the conclusion that ...</p>
VI. Your opinion of the article	<p>I found the article interesting (important, dull, of no value, too hard to understand)</p> <p>I consider the text very informative</p>

Text 6. Main Sources of Food

There are three main sources of food for man. They are crops, livestock and fish (рыба). Of these, crops make up about 75% of the world's food production, 23% is contributed by livestock and only 2% of food comes from fish.

Many foods are obtained from farm animals. They are meat, milk and eggs. Milk is often called (называть) the nature's most important food.

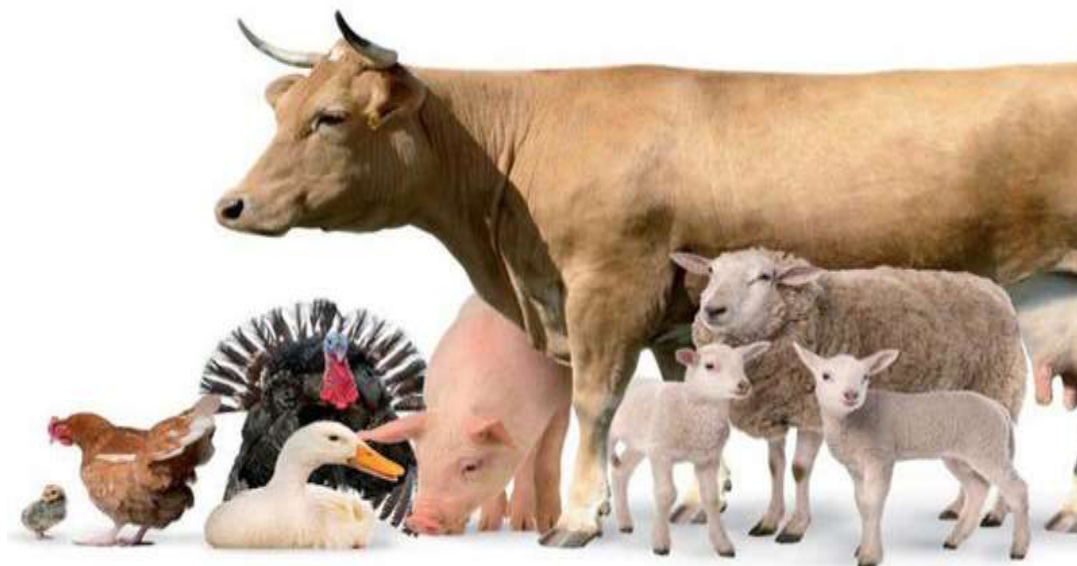
Meats from farm animals are highly important as food for people. The animals most often used for this purpose are beef cattle, hogs, sheep, and poultry. Meat from mature (взрослый) sheep is known as mutton. How do we can meat from hogs? From mature beef cattle? From young "beef cattle?"



Text 7. Farm animals

Animal husbandry, a branch of agricultural production, includes the breeding of farm animals and their use. Farm animal are highly important sources of food for man. They are known to produce highly nutritious products such as milk, meat and eggs. In addition, the skin of animals, down and feather of poultry and wool of sheep are used as raw materials to produce clothing and for many other purposes. The most important group of farm animals is cattle. There are four types of cattle. They are dairy cattle, beef cattle, draft cattle and dual-purpose cattle. Dairy cattle, that is, dairy cows provide milk that may be used in making various dairy products. Beef cattle are the producer of beef. One can raise dual-purpose cattle producing both milk and meat. Draft cattle and horses are almost everywhere replaced by agricultural machinery. Important sources in producing human food are sheep and hogs. Sheep are raised for two purposes: wool and mutton production. The production cycle of hogs is much shorter than that of cattle or sheep. In other words, like the other farm

animal's hogs are rapid growing ones. They may be fattened in less than six months. That is why hog breeding is one of the most important and economic ways of solving the problem of supplying the population with meat.



Пояснения к тексту

1. dual-purpose cattle - мясо-молочный скот
2. that is-то есть

13. Переведите предложения и объясните значение слов one и that

1. The problem of supplying the population with meat is the one that must be solved in the "near future. 2. We know that farm animals are important sources of food for people. 3. Hay made from alfalfa is higher in nutrients than that made from grasses. That is why farmers grow this crop widely. 4. One should provide farm animals with proper feeds. 5. Concentrates, that is, the feeds high in protein and energy are good for hogs. 6. Products that are produced by farm animals are highly nutritious.

14. Замените русские слова, данные в скобках, на их английские эквиваленты

1. Farms breeding sheep produce (баранина) and (шерсть). 2. Milk produced by this (корова) is of high quality. 3. Both milk and meat are produced by (мясо-

молочными коровами). 4. Poultry supply us with meat, eggs, (пух) and (перо). 5. About sue months is usually required to (откармливать) а pig. 6. Сельскохозяйственные животные are highly important (источники) of food for man. 7. There are four types of (крупного рогатого скота). 8. They are (молочный) cattle, beef (мясной) cattle, draft cattle and dual-purpose cattle.

15. Найдите и переведите в тексте предложения, в которых говорится

- о продуктах, которые дают нам животные;
- об использовании молока;
- об особенностях свиней по сравнению с другими видами сельскохозяйственных животных;
- о том, что даёт мясомолочный скот;

16. Ответьте на следующие вопросы

1. Why are farm animals so important for man?
2. What are the four types of cattle? What raw materials do farm animals supply industry with?
3. What are sheep raised for?
5. Why is hog breeding the most economical way of producing meat?

UNIT 2. TYPES OF MEAT



1. Выпишите и выучите слова

aquatic - водный, водяное растение или животное

carcass - туша (животного), тушка (птицы)

calf - телёнок

connective tissue - соединительная ткань

domesticate - приручать, одомашнивать (животных)

fine-grained - тонковолокнистый

flesh - сырое мясо

game - дичь

guinea fowl ['gini foul] - цесарка

marbling - «мраморность» (мяса)

identify - 1) отождествлять; идентифицировать 2) устанавливать; определять

lamb - 1) ягнёнок, барашек; 2) молодая баранина

lean - постное мясо

milk-fed lamb - молочный ягнёнок

muscle - мускул, мышца mutton - баранина

slaughter - убой (скота, птицы); первичная переработка (скота); забивать (скот)

tender - нежный, мягкий

tissue - ткань

veal - телятина

water buffalo – буйвол

2. Прочитайте, переведите текст и составьте план пересказа

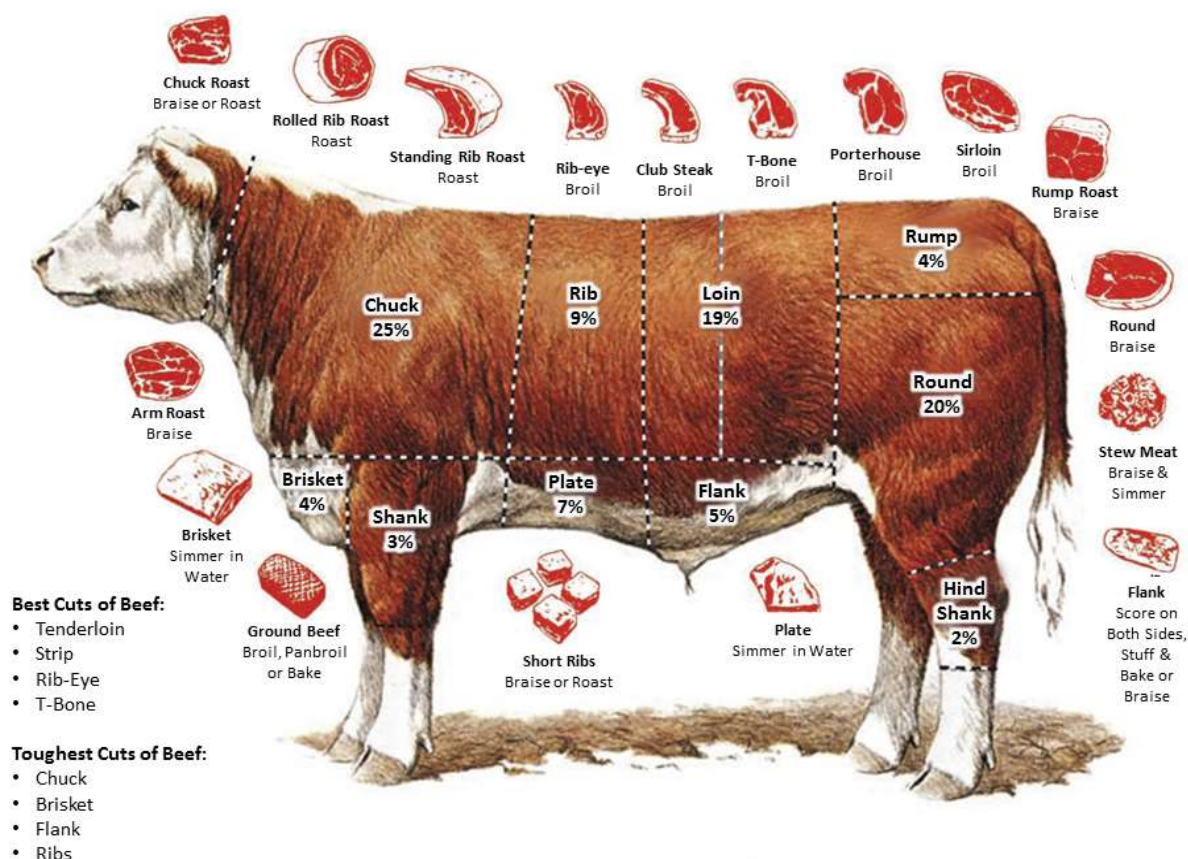
Text 1. Beef



Beef is flesh of mature cattle, as distinguished from veal, i. e. the flesh of calves. The best beef is obtained from early maturing, special beef breeds. High-quality beef has firm, velvety, fine-grained lean, bright red in color and well-marbled, the fat being smooth, creamy white, and well distributed. In young beef the bones are soft, porous, and red; the less desirable mature beef has hard white bones. Beef tenderness and flavor are improved by ageing: in one common aging method the carcass is hung for about two weeks at approximately 2° C, encouraging physical changes in the muscle tissue that enhance the quality of the meat. Grading standards are somewhat similar in various countries, as there is a large international beef trade. In the United States, grades in order of quality are prime, choice, good, commercial, utility, cutter, and canner. Commercial grades are mainly from mature cattle, especially cows. Utility, cutter, and canner grades are used in processed meat products. Beef hide, used for leather manufacture, is a valuable by-product of beef. The primary beef-consuming countries of the world (in per capita terms) are Uruguay, Argentina, New Zealand, Australia, and the United States. Beef is not particularly popular in most of Southeast Asia, Africa, and the Indian subcontinent; the sanctity of the cow in the Hindu religion forbids the consumption of its meat by the Hindus, Beef is not unusual in the cuisines of Korea and Japan, however; in Kobe, Japan, near Osaka, a highly prized beef is produced from cattle that are vigorously massaged and fed a liberal dietary supplement of beer.

Butchering practices differ among countries resulting in a variety of names for the different cuts. In the United States, where beef is the most popular meat, steaks

(that is cross-sections from the fleshier parts of the carcass) are among the most desirable cuts. In Britain ribs used for roasting are the most valued cuts. Less desirable cuts may be used in stews or ground meat. Boiled beef is popular in some cuisines, as in the French dish known as pot-au-feu. Corned beef or salt beef in Britain is prepared from a brisket or rump cut.



3. Прочитайте текст и ответьте на следующие вопросы

1. Каковы основные характеристики качественной говядины?
2. Назовите главные страны потребители говядины?
3. В каких странах говядина не является популярной?
4. Какие орудия используются для разделки и обработки говядины?
5. Какое самое известное блюдо из говядины в США?
6. Из чего готовится солонина в Британии?

3. Прочитайте и переведите текст



Text 2. Veal

Veal is meat of calves slaughtered between 3 and 14 weeks, delicate in flavor, pale grayish white in color, firm and fine-grained, with velvety texture. It has no marbling, and the small amount of fat covering is firm and white. In modern livestock farming, calves bred to yield high-quality veal are raised indoors under controlled temperatures 16°-18°C and intensively fed on milk, high-protein calf meal, or both. Grasses are excluded, resulting in an iron deficiency producing the desirable light color in the meat. Although the meat of an animal from 15 weeks to one year is technically called calf, it is frequently marketed as veal. Wholesale cuts, usually smaller than comparable beef cuts, vary in different countries. Because of its high amount of connective tissue and low fat content, large cuts of veal require long, slow cooking. Fat in the form of lard or salt pork may be added to avoid dryness. Veal is often served rare in European countries but is usually thoroughly cooked in the U.S. Cuts such as the leg, loin, shoulder, and breast are usually roasted, often boned and stuffed, or braised. Schnitzel, pan-fried cutlets coated with bread crumbs, are a specialty of Germany and Austria. Scallops, small thin slices - called scaloppini in Italy and escallops or medallions in France may be cooked in wine or other sauces.

5. Выучите слова

cutlets - котлеты

comparable - сопоставимые

deficiency - дефицит
frequently - часто
medallions - медальоны
meal - мука крупного помола
pale grayish - бледно-сероватый
pan-fried - на сковороде
roasted - жареный
rare - недожаренный, полусырой
stuffed - фаршированные
sauces - соусы
veal - телятина

6. Прочитайте текст и обсудите следующие темы

1. Основные характеристики качественной телятины.
2. Части телятины, которые используют для еды в США.

7. Назовите эквиваленты следующих интернациональных слов

high-protein calf meal, grasses, livestock fanning, pale grayish, pan-fried cutlets, intensively fed.

8. Вставьте вместо точек слова, подходящие по смыслу

1. ... and the small amount of fat covering is firm and white.
2. Wholesale cuts, usually smaller than comparable beef cuts ...
3. Veal is often served ... in European countries but is usually thoroughly ... in the U.S.
4. Cuts such as the leg, loin, shoulder, and breast are usually ..., often ... and stuffed, or
3. Scallops, small dim slices - ... and escallops or ... in France ... cooked in ... or other sauces.

9. Прочитайте, переведите и перескажите текст

Text 3. Pork



Pork is flesh of hogs, usually slaughtered between the ages of six months and one year. The most desirable pork is grayish pink in colour, firm and fine-grained, well-marbled, and covered with an outer layer of firm white fat. About 30 percent of the meat is consumed as cooked fresh meat; the remainder is cured or smoked for bacon and ham, used in sausage, and used to produce lard. Because pigs may be infected by the parasitic disease trichinosis, pork must be cooked to an internal temperature of 71 °C in order to destroy the disease-causing organism. Pork carcasses are graded according to the amount of edible meat they will yield. In the United States, where individual cuts are not graded, a U.S. Number 1 carcass is the one having the most satisfactory ratio of fat to lean; Number 2, Number 3, and Number 4 have a higher proportion of fat. Reducing the amount of lean. Utility-grade pork, which is usually from mature animals, has too little fat and is quite firm. The main cuts of pork are hams, spareribs, loin chops, bellies, picnic shoulders. Pork is one of the most popular types of meats and is consumed around the world. However, it is prohibited by the dietary laws of Judaism and Islam, so pork is virtually unknown in the cuisines of the Middle East and those of some local populations in Asia and Africa. The chief pork-consuming countries (on a per capita basis) are Germany, Denmark, Poland, and Austria. In Western cooking fresh pork is commonly roasted, choice cuts being the loin, leg and rib sections known as spareribs. Chops from the loin and ribs are usually grilled or pan-fried. A spit-roasted whole young piglet, or

suckling pig, is a delicacy in central and eastern Europe; wild pigs have traditionally been cooked in a similar manner throughout the Pacific. Less desirable parts - ears, tail, hocks, feet, brains - and the fatty portions of the back of the carcass (fatback) may be cooked with various greens, especially in the southern United States. In China and Southeast Asia, pork is commonly shredded and fried with vegetables and spices. Pork-and-vegetable mixtures are also used to stuff a variety of small rolls, buns or dumplings.

10. Выучите слова

trichinosis - трихинеллез

spit-roasted - зажаренный на вертеле

hock - коленное сухожилие

dumpling - клецка

spit-roasted - на вертеле

spices - специи

stuff - вещи

buns - булочки

spareribs - свиные отбивные

proportion - доля

ratio - соотношение

edible - съедобный

reducing - снижение

ham - ветчина

consumed - потребляемая

lard - сало

11. Прочитайте текст и обсудите следующие вопросы

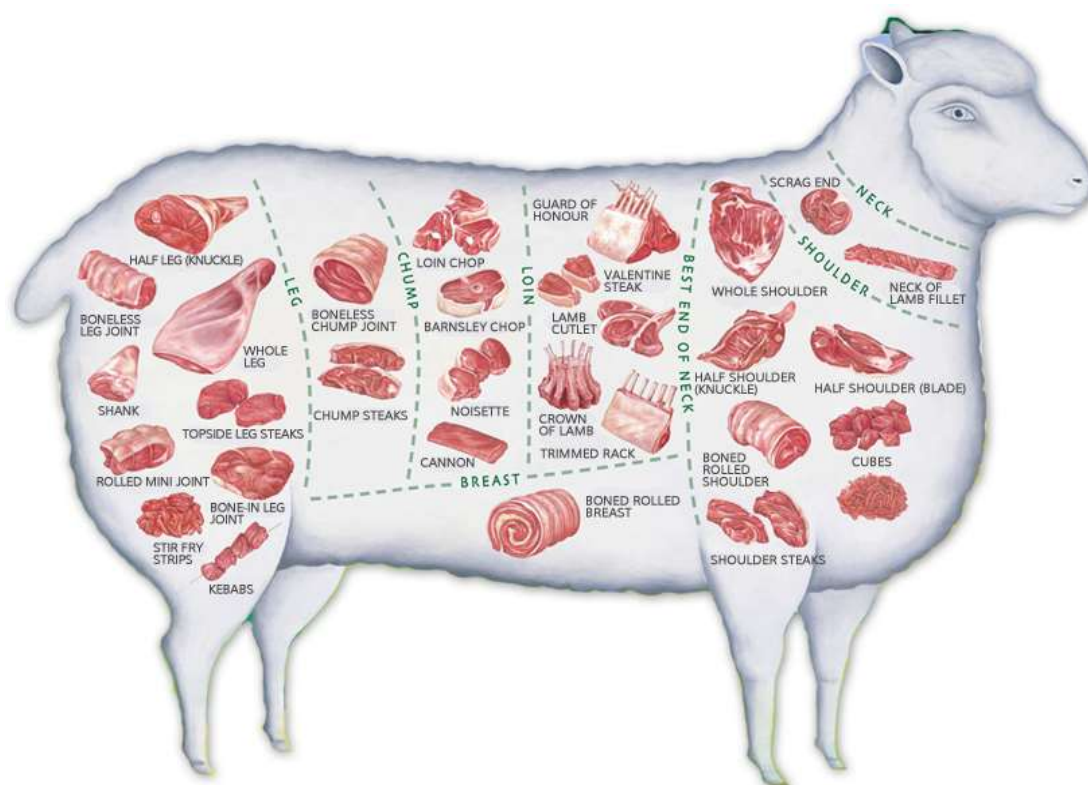
1. Какие существуют классификации тушь свиньи?
2. Как приготовить отбивные.

12. Назовите русские эквиваленты следующих интернациональных слов loin chops, piglet, Pork-and-vegetable mixtures, slaughtered.

13. Вставьте вместо точек слова, подходящие по смыслу

- 1) Chops from the loin and ribs are usually
- 2) ... be infected by the parasitic disease trichinosis, pork must be cooked to an internal temperature of 71 °C in order to destroy the disease-causing Organism.
- 3) Pork is one of the most ... and is consumed around the world.

14. Text 4. Lamb Прочитайте, переведите и перескажите текст



Lamb is live sheep before the age of one year, and the flesh of such animals. Mutton refers to the flesh of the mature ram or ewe at least one year old; the meat of sheep between 12 and 20 months old may be called yearling mutton. The meat of sheep 6 to 10 weeks old is usually sold as baby lamb, and spring lamb is from sheep of five to six month. The mild flavour of lamb is preferred in most Western countries; the stronger flavour of being desirable in many Middle and Far Eastern countries.

Milk-fed lamb is especially delicate in flavour. The colour of the lean, deepens as the animal grows older. In the lamb it ranges from light to dark pink, in yearling mutton it is medium pink to light red, in mutton it is light to dark red in colour. The fat, soft and creamy white to pale pink in the lamb, hardens and whitens in older sheep. Bones also harden and whiten, becoming porous in the yearling and extremely hard in the mature animal. In the United States the carcass may be separated into sides and then divided into wholesale cuts; it may be cut straight across into saddles (upper back portion of the carcass from last rib to legs), or it may be cut into leg, loin, shoulder, breast, and shank.

The outer fat covering may be removed from the cuts. U.S. quality grades for lamb include prime, choice, good, utility, and cull, mature mutton grades being choice, good, utility, and cull. The primary lamb- and mutton-consuming countries (on a per capita basis) are New Zealand, Australia, Greece, Uruguay, and Ireland. The leg, saddle, and shoulder, although they contain higher proportions of bone to meat, are considered the finest cuts by some cooks. In the United States popular cuts include individual chops from the ribs or loin, the leg. A regional specialty, actually unknown outside of the state of Kentucky, is barbecued mutton. Curried mutton, served with rice, is a favorite dish of Jamaicans. The traditional British lamb roast is distinguished by a fresh mint sauce. Lamb also plays an important part in classic French cuisine; unlike American- or English-style preparation, however, French recipes often require shorter cooking times, yielding rare or pinkish meat. Lamb predominates in the cuisines of Greece, Turkey, and the Middle East, commonly marinated and roasted on a skewer (shish kebab) or cooked with local vegetables. A classical Middle Eastern dish known as kibbe is a mixture of ground lamb and cracked wheat.

15. Прочитайте текст и обсудите следующие вопросы

1. Основные потребители баранины.
2. Любимое блюдо Ямайцев.
3. Что такое кибби?

16. Назовите русские эквиваленты следующих интернациональных слов

French cuisine, fresh mint sauce, pale pink, mature ram, wholesale cuts.

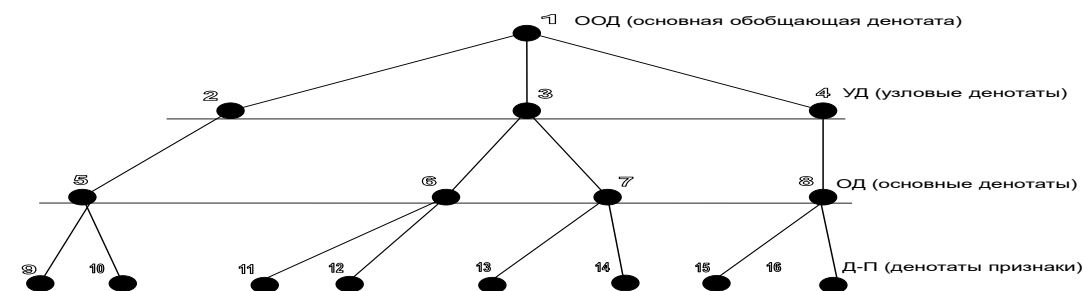
17. Вставьте вместо точек слова, подходящие по смыслу

1. Lamb is live sheep before the age of one year, and the flesh of ...
2. The fat, soft and creamy white to pale pink in the ..., hardens and whitens in older
3. Classical Middle Eastern dish known as kibbe is a mixture of ground lamb and ...
4. The leg, saddle, and shoulder, although they contain ... are considered the finest cuts by some cooks.... .

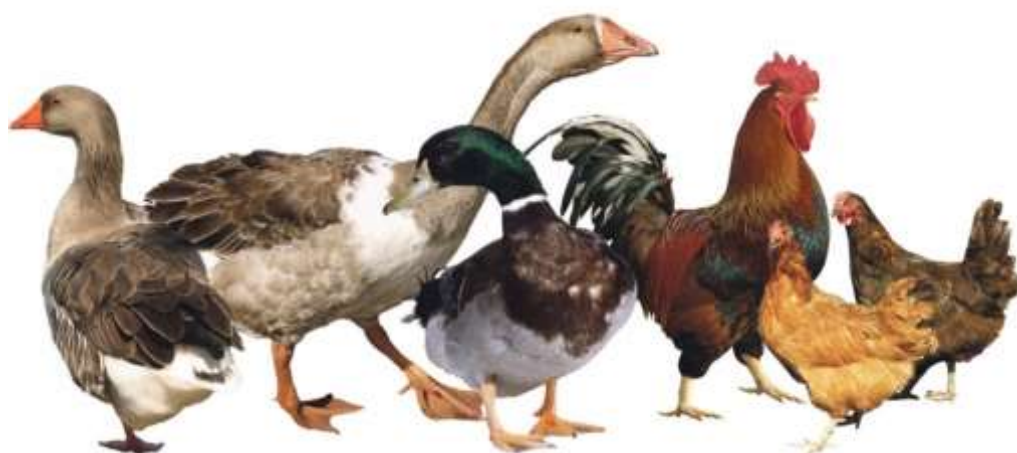
18. Прочитайте и переведите текст. Составьте денотатную схему текста по образцу

Для составления денотатной схемы необходимо:

1. Проанализировать содержание текста с целью определения денотат (т.е. учебных элементов темы: процессов, явлений, свойств);
2. Составить список денотат;
3. Представить графически факты в виде денотатной схемы, используя логическую цепочку;
4. Определить основную обобщающую денотату, т.е. название темы;
5. Обозначить узловые денотаты, т.е. названия подтем;
6. Обозначить основные денотаты, т.е. название понятий;
7. Назвать денотаты-признаки.



Text 5. Poultry and Game



The flesh of birds and game forms a large part of the meat diet of man and, in this respect, ranks next to the flesh of mammalian. It is chiefly characterized by an absence of fat, although domesticated birds are covered with fat by abundant feeding, but wild birds are lean and practically devoid of fat. The flavour of different birds varies considerably, but generally depends upon the manner of feeding.

Poultry includes chickens, turkeys, ducks, geese, guinea-fowl, and pigeons.

Chickens are divided according to size and age. There are: spring chickens, birds not more than 6 months old; roasters, birds from 1,5 to 3 years old; and boilers, which are principally hens over 3 years old.

Turkeys form the most important part of trade in Britain. The flesh of turkeys, compared with that of chickens, is dense and coarse in texture, but improves in flavor with being allowed to hang for a short time.

Ducks. The flesh of the domesticated duck contains a quantity of fat, if abundantly fed. Young ducks or ducklings are ready for the market at the age of 3-4 months. Young ducks have very smooth downy skins of a light color.

Geese. The best table breeds are grey and white. The flesh of the goose is strong in flavor, and if beyond its full growth, coarse, fat, and indigestible. The flesh of the gosling may be insipid if too young. The best age is 3-6 months.

Guinea-fowl. This bird is a native of Guinea in Africa, where it is wild and in abundance. The flesh is darker than chicken, somewhat resembling pheasant. It is at its best when 6 months old.

Pigeons. The flesh of pigeons, unless young, is dense, firm and indigestible. The best age to kill is when the birds have attained their full feathers, which is usually 8-10 weeks. The method of killing is the same as for chickens.

Although poultry, with the exception of chickens, are allowed to “hang” for some days to improve their flavor and make them tender, they are not consumed in a decomposing state, as is the case with game. Poultry in a state of decomposition is regarded as unsound.

Game may be divided into furred and feathered one, the former being **deer** (venison) and **hares** and the latter, **pheasants**, **grouse**, **partridges**, **wild ducks** and other game birds. Game birds are subject to close seasons, although imported game can be sold throughout the year.

It is the usual custom to consume game in a state of putrefaction. The reason for this being that the flesh is rendered soft and easy of digestion. The time for hanging different game varies; thus a pheasant is usually allowed to hang for a week, a partridge five days, hare three days, etc. Some gourmets, however, will consume with great relish, say, a grouse that is really in an advanced state of decomposition. It is a difficult matter to decide at what stage of decomposition game actually does become unfit. The usual practice is to seize game that is maggoty and the flesh is green, soft, flabby, and putrid.

19. Ответьте на следующие вопросы к тексту 5

1. How is the flesh of birds and game characterized?

2. What factor influences the flavor of different birds?
3. What poultry are allowed to “hang” for some days in order to improve their flavor?
4. It is the common practice to “hang” game, isn’t it?
5. What is the usual custom to consume game?
6. Why is game consumed in a state of putrefaction?
7. Would you like to consume, say, a grouse in a state of decomposition?

20. Определите предложения, соответствующие содержанию текста 5.

1. The flesh of poultry and game ranks next to the flesh of mammalian in terms of volume of consumption.
2. The flavor of different birds depends upon the quantity of fat in the flesh.
3. Chickens are usually divided into domestic and wild.
4. Turkeys are the most popular poultry in Britain.
5. Poultry are allowed to “hang” for some days to improve their flavor.
6. Game may be divided into furred and feathered one.
7. Both poultry and game are consumed in a state of decomposition.

21. Прочитайте три части текста. Озаглавьте каждую из них и скажите, какие из них дополняют информацию текстов 4 и 5

1. Some people avoid eating the flesh of animals (meat, poultry, or fish). They are known as vegetarians.

People are vegetarians for a number of reasons. Some think that it is wrong to keep and kill animals for use as food. Others choose to be vegetarians because they believe that a vegetarian diet is healthier than a diet that includes meat. Indeed, a vegetarian diet fits in very well with modern medical advice to cut down on fats, salt, and sugar, and to eat more fiber and fresh vegetables. It is also cheaper than meat. S for ecological reasons. They argue that the growing of vegetables takes up much less valuable space than the raising of livestock; moreover, it is easier to provide food for all the people on Earth by growing vegetables for food rather than raising vegetable-eating animals.

2. Amongst the order of Mollusca used for human food one can find the oyster, scallop, mussel, clam, cockle, whelk and periwinkle. The internal organs of mollusks consist of a heart, liver, gut, genitals, breathing apparatus.

Oysters, the aristocrats of the shellfish, are imported from abroad, therefore, they can be obtained practically the whole year through. About five years must elapse before the oysters becomes mature and ready for the market. There are many oysters fisheries around the world. Oysters may be kept alive for lengthy periods in tanks containing ozonized sea-water, which is constantly changed. The tanks are usually made of wood. In living oysters, the shells are tightly closed. It is essential that they should be alive when opened and consumed immediately.

Crustaceans are articulated animals, nearly all of them aquatic, the skins of which contain calcareous deposits, rendering them hard and shell-like, and the flesh contained within. Those crustaceans used for food are crabs, lobsters, crayfish, prawns and shrimps, all of which are cooked before sale. Boiling turns the shell red or pink, due to chemical change in a natural pigment. Crustaceans, especially lobsters and crabs, are all foul feeders, and it is essential that they should be thoroughly cleaned before being eaten, otherwise they may cause outbreaks of gastro-enteritis and typhoid fever.

3. The continued application of science and technology to the slaughter of animals and processing of meat is essential. Modern slaughter and processing plants have already achieved considerable reduction in their labor requirements. However, the potential for further automation exists. The industry will probably continue on the path toward total automation. Not only will greater automation allow for greater speed and efficiency, but it will allow a shift of personnel to quality control and research and development.

The trend toward centralized preparation of retail meat products calls for improved meat distribution techniques. There are two aspects of distribution that must be improved. First, special equipment and one people are vegetarians because of their religious beliefs. Some people have chosen to be vegetarian technology are required to maintain freshness and extend shelf life. This will reduce spoilage,

another major source of loss in the meat industry. Secondly, along with the distribution system, a market system should be established which will assure that each individual product goes into the market where the consumer demand for that product is greatest. This will assure greater consumer satisfaction and, at the same time, increase profits to the total industry.

22. Обсудите содержание первой части текста в паре, задав 5-6 вопросов своему товарищу, а затем ответьте на его вопросы

23. Ответьте на вопросы ко второй части текста

1. What meat category is dealt with in the text?
2. What are the aristocrats of the shellfish?
3. What is essential about oysters?
4. What crustaceans are used for food?
5. What should be done with crustaceans before: a) sale; b) being eaten?

24. Переведите третью часть текста с помощью словаря

25. Прочитайте текст 6 и ответьте на вопросы

1. Почему важно употреблять в пищу субпродукты и в каком виде?
2. Какое свойство субпродуктов необходимо учитывать при их переработке?

26. Прочитайте и переведите текст. Назовите виды мяса, о которых идёт речь в тексте

Text 7. Types of Meat

Meat is defined as those animal tissues which are suitable for use as food. Those are the main soft tissues of the carcass: muscle, fatty and connective tissues. Other animal tissues used as food are the internal organs and the blood.

The majority of the meat consumed by humans comes from domestic animals and aquatic organisms.

Meat can be subdivided into several categories. The largest category, in terms of volume of consumption, is “red” meat. Beef, pork, lamb or mutton, and veal are the most common “red” meats. However, horse, goat, eland, llama, camel, water buffalo, and rabbit meats are commonly used for human consumption in many countries. Poultry meat is the flesh of domestic birds, and includes that of chickens, turkeys, ducks, geese, and guinea fowl. Seafood is the flesh of aquatic organisms, of which the bulk are fish. However, the flesh of clams, lobsters, oysters, crabs, prawns, etc. are also included in this category. A fourth category is that of game meat, which consists of the flesh of all non-domesticated animals and birds.

The most widely consumed meat is beef. Beef is the flesh of mature cattle (over 6 months of age) that normally weighs from 450 to 540 kg. High-quality beef has firm, velvety, fine-grained lean, bright red in color and well-marbled, the fat is smooth, creamy white, and well distributed. It is fat that influences the flavor, juiciness, and tenderness of the lean.

Veal is meat of calves slaughtered between 3 and 14 weeks, delicate in flavor, pale grayish white in color, firm and fine-grained, with velvety texture. It is much less fatty than beef. It has no marbling, and the small amount of fat covering is firm and white. High-quality veal is obtained when calves are raised indoors under controlled temperatures 16-18 °C and intensively fed on milk and high-protein calf meal. Grasses are excluded. As a result, an iron deficiency produces the desirable light color in the meat.

The pig is the world’s second largest provider of meat known as pork. When pigs are taken to slaughter, they generally weigh between 90 and 135 kg and provide about 70 to 74 percent of that weight in meat. The most desirable pork is grayish pink in color, firm and fine-grained, well-marbled, and covered with an outer layer of firm white fat. About 30 percent of the meat is consumed as cooked fresh meat; the remainder is cured or smoked, used in sausage and lard production.

Meat from lambs and sheep is produced on a much smaller scale than either beef or pork. Lamb is live sheep before the age of one year, and the flesh of such animals. Mutton refers to the flesh of the mature ram or ewe at least one year old; the meat of

sheep between 12 and 20 months old may be called yearling mutton. The meat of sheep from 6 to 10 weeks old is usually sold as baby lamb. The most select lambs may weigh no more than 14 to 18 kg. Milk-fed lamb is especially delicate in flavor. The color of the lean deepens as the animal grows older. The fat, soft and creamy white to pale pink in the lamb, hardens and whitens in older sheep.

Meats are marketed as fresh or processed goods or become ingredients of various meat products. Processed or manufactured products prepared from animals' tissues are also called meat.

Notes: in terms of - с точки зрения

at least - по крайней мере

27. Найдите в правой колонке русские эквиваленты английских слов, приведённых в левой колонке.

marbling	а) вкус, запах
to distribute	б) мышца
flesh	в) сырое мясо
muscle	г) морепродукты
tissue	д) туша
flavour	е) потребление
carcass	ж) ткань
seafood	з) качество
consumption	и) «мраморность» (мяса)
quality	к) распределять

28. Найдите среди слов под буквами а, б, с синонимы к словам, приведённым в левой колонке.

1. part	а) portion	в) protein	с) proportion
2. manufacture	а) consume	в) provide	с) produce
3. to use	а) identify	в) apply	с) define
4. various	а) essential	в) desirable	с) different
5. essential	а) useful	в) important	с) common
6. amount	а) quantity	в) volume	с) category
7. fat	а) small	в) firm	с) stout
8. tough	а) coarse	в) smooth	с) velvety

29. Найдите среди слов под буквами а, b, с слова с противоположными значениями по отношению к словам из левой колонки

1) lean	a) soft	b) hard	c) fatty
2) large	a) small	b) wide	c) deep
3) include	a) call	b) come	c) exclude
4) wide	a) narrow	b) long	c) slow
5) tough	a) smooth	b) delicate	c) firm
6) fat	a) fresh	b) delicate	c) slender
7) fine	a) bright	b) elastic	c) coarse
8) coarse	a) tender	b) mature	c) light

30. Выберите определения к следующим терминам

1. beef	1. The provider of meat known as pork
2. pig	2. The flesh of mature cattle.
3. poultry meat	3. Difficult to masticate.
4. meat	4. Animal tissues which are suitable for use as food.
5. tough	5. The flesh of a young cattle.
6. ingredient	6. The flesh of domestic birds.
7. veal	7. A substance used to make a mixture.
8. calf	8. A young cattle.
9. marbling	9. An organ of movement which is highly contractive, extensible and elastic.
10. muscle	10. Visible intramuscular fat located in the connective tissues.

31. Закончите предложения в соответствии с содержанием прочитанного текста

- The term «meat» is used to describe
 - muscles and fat*
 - the flesh or other edible parts of animals*
 - ham and sausages*
- Meats are often classified by
 - physical properties*
 - colour and smell*
 - the type of animals*
- Meats are marketed as

- a) *fresh or processed goods*
- b) *additives for other foodstuffs*
- c) *fast food*

32. Ответьте на следующие вопросы к тексту

1. What is the general definition of meat?
2. What are the main soft tissues of meat?
3. Meat is subdivided into several categories, isn't it? Name those categories.
4. What are the most widely consumed types of meat?
5. What are the main characteristics of beef / veal / pork / lamb?
6. How is high-quality veal obtained?
7. How are meats marketed?

33. Заполните таблицу, в которой укажите названия мяса из категории «red meat» и отличительные свойства каждой разновидности

<i>Разновидность «красного» мяса</i>	<i>Свойства</i>

34. Прочитайте, переведите текст и подготовьте аннотацию

Text 8. Types of meat

Meat is the common term used to describe the flesh or other edible parts of animals (usually domesticated cattle, swine, and sheep) used for food, including not only the muscles and fat but also the tendons and ligaments. Processed or manufactured products prepared from animal tissues are also called meat. Containing all the amino acids necessary for the human body, meat is valued as a complete protein food. The fat of meat, which varies widely with die species, quality, and cut, is a valuable source of energy and also influences the flavor, juiciness, and tenderness of the lean. Parts such as livers, kidneys, hearts, and other portions arc excellent

sources of vitamins and of essential minerals, easily assimilated by the human system. Meat digests somewhat slowly, but 95 percent of meat protein and 96 percent of the fat are digested. Fats tend to retard the digestion of other foods; thus, the higher the proportion of fat the longer meat remain in the stomach, delaying hunger and giving "staying power". Extractives in meat cause a flow of saliva and gastric juices, creating the desire to eat and ensuring ease of digestion. Meats are often classified by the type of animal from which they are taken. Red meat refers to the meat taken from mammals; white meat refers to the meat taken from fowl; seafood refers to the meat taken from fish and shellfish; and game refers to meat taken from animals that are not commonly domesticated. In addition, most commonly consumed meats are specifically identified by the live animal from which they come. The most widely consumed meat is beef, the flesh of mature cattle than normally weighs fi-om 450 to 540 kg and yield between 55 and 60 percent of their weigh in meat. Veal, the flesh of calves of cattle, is much less fatty than beef. The pig is believed to be the world's second largest provider of meat known as pork. When taken to slaughter, pigs generally weigh between 90 and 135 kg and provide about 70 to 74 percent of than weight in meat. Meat from lambs and sheep is produced on a much smaller scale than either beef or pork (less than one-tenth of Out provided by cattle, for example) They ordinarily weigh between and 70 kg, although the most select lambs may weigh no more than 14 to 18 kg and yield about 48 to 50 percent of their weight in meat. The meat-products industry, though called meat picking, includes the slaughtering of animals. The steps in this process generally include stunning, bleeding, eviscerating, and skinning. Carcasses are then inspected and graded according to government-set standards of quality.

35. Назовите русские эквиваленты интернациональных слов

Addition, carcasses, delaying hunger, meat-products, largest provider, amino acids, essential minerals, edible parts.

36. Вставьте вместо точек слова, подходящие по смыслу

1. Processed or ... from animal tissues are also called meat.
2. The steps in this process generally include stunning... .
3. ... calves of cattle, is much less fatty than beef.
4. Parts such as livers, kidneys, hearts, and other portions are excellent sources of vitamins and of essential minerals... .
5. Meat digests somewhat slowly, but 95 percent of meat protein and 96

38. Найдите в тексте и переведите предложения, в которых говорится

1. Что такое мясо.
2. Влияние жиров на усвоение других продуктов.
3. Из каких видов состоит мясо.
4. Вес свиньи при отправке на убой.

39. Прочитайте и обсудите информацию о видах мяса и их преимуществах

Types of Meat and Their Benefits (Includes Nutritional Profiles)

There are many different types of meat, and all have been part of the human diet for millennia. Generally speaking, meat is good for you and provides a huge range of essential nutrients. This article reviews the nutritional profile, health benefits and concerns of eight common varieties of meat.

What kind of meat is the healthiest?

1. Pork



Pork is one of the most popular forms of meat in the world.

Despite some confusion on the issue, pork is classed as red meat. This is because it contains a large amount of myoglobin, a protein responsible for the red color of meat.

In fact, there are so many different cuts of pork, and a variety of meat products use it such as;

- Bacon
- Ham
- Hot dogs
- Jamon
- Prosciutto
- Salami
- Sausages

Nutrition Facts

Here is the typical nutritional profile for ground pork meat per 100g ([1](#)).

(Note: Different cuts of meat will vary in their nutrient content, but this provides a general idea of each meat, and the cuts are as close a match as possible.)

Nutrient	Amount
Calories	263 Kcals
Carbohydrate	0 g
Protein	16.9 g
Fat	21 g
– Saturated	7.9 g
– Monounsaturated	9.4 g
– Polyunsaturated	1.9 g
– Omega-3	70 mg
– Omega-6	1670 mg

Omega 6 to 3 Ratio	23.8 : 1
Vitamin A	0
Vitamin C	1% RDA
Vitamin D	—
Vitamin E	—
Vitamin K	—
Thiamin	49% RDA
Riboflavin	14% RDA
Niacin	22% RDA
Vitamin B6	19% RDA
Folate	1% RDA
Vitamin B12	12% RDA
Pantothenic Acid	7% RDA
Calcium	1% RDA
Iron	5% RDA
Magnesium	5% RDA
Phosphorus	18% RDA
Potassium	8% RDA
Sodium	2% RDA
Zinc	15% RDA
Copper	2% RDA
Manganese	1% RDA
Selenium	35% RDA

Benefits

- Pork is a particularly significant source of thiamin (vitamin B1). The content of this important vitamin is much higher than in other meat and plays an essential role in glucose metabolism and protecting cardiac health (2, 3).

- Much cheaper than most other meats.
- Pork contains decent amounts of selenium and zinc, which are responsible for boosting the immune system, defending against oxidative stress, and optimal hormone production (4, 5).

Concerns

- Compared to other meats, pork contains extremely high levels of omega-6 fatty acids. Despite being essential for health, an unbalanced ratio of omega-6 to omega-3 can be pro-inflammatory in nature (6).
- Pork is more susceptible to bacterial contamination and food-borne illnesses than other meat; ensuring pork is thoroughly cooked is essential (7, 8).

2. Beef



When most people think of red meat, they probably imagine beef.

There are many different beef products and cuts of beef, ranging from hamburgers to rib eye steaks.

While mainstream health advice often dictates selecting the leanest cuts of red meat, fatty cuts of beef are perfectly healthy.

Nutrition Facts

Here are the nutrient values for ground beef meat per 100g (9).

Nutrient	Amount
Calories	254 Kcals
Carbohydrate	0 g
Protein	17.2 g

Fat	20 g
– Saturated	7.7 g
– Monounsaturated	8.8 g
– Polyunsaturated	0.5 g
– Omega-3	48 mg
– Omega-6	435 mg
Omega 6 to 3 Ratio	9 : 1
Vitamin A	0% RDA
Vitamin C	0% RDA
Vitamin D	–
Vitamin E	2%
Vitamin K	2%
Thiamin	3% RDA
Riboflavin	9% RDA
Niacin	21% RDA
Vitamin B6	16% RDA
Folate	2% RDA
Vitamin B12	36% RDA
Pantothenic Acid	5% RDA
Calcium	2% RDA
Iron	11% RDA
Magnesium	4% RDA
Phosphorus	16% RDA
Potassium	8% RDA
Sodium	3% RDA
Zinc	28% RDA

Copper	3% RDA
Manganese	1% RDA
Selenium	21% RDA

Benefits

- Despite fearmongering over the fat content of beef, the main fatty acid in beef is none other than oleic acid. If you haven't heard of it before, then it's the main fat in olive oil (and known as "heart healthy") ([10](#), [11](#)).

- Beef contains a wide variety of beneficial compounds that include creatine, conjugated linoleic acid (CLA), and glutathione ([12](#), [13](#), [14](#)).

Concerns

- Excessive beef consumption can increase circulating iron to unhealthy levels in *some* individuals. These high levels can increase the risk of various cancers and cardiovascular disease. This risk is especially the case in those with a genetic mutation called hemochromatosis, which causes over-absorption of heme iron ([15](#), [16](#)).

- Overcooking beef (burning) can lead to the formation of polycyclic aromatic hydrocarbons (PAHs) and heterocyclic amines (HCAs). Both of these compounds are carcinogens, but we can minimize their risks by sensibly cooking meat ([17](#), [18](#)).

3. Lamb and Mutton



Both lamb and mutton are very similar types of meat, with one fundamental difference;

- Lamb is from a sheep less than one-year-old
- Mutton is the meat of an adult sheep

Just like beef and pork, there are a variety of popular lamb cuts — perhaps lamb chops are the most popular.

Nutrition Facts

Per 100g, the nutritional profile of ground lamb meat looks something like this (19);

Nutrient	Amount
Calories	282 Kcals
Carbohydrate	0 g
Protein	16.6 g
Fat	23.4 g
– Saturated	10.2 g
– Monounsaturated	9.6 g
– Polyunsaturated	1.9 g
– Omega-3	420 mg
– Omega-6	1360 mg
Omega 6 to 3 Ratio	3.2 : 1
Vitamin A	0% RDA
Vitamin C	0% RDA
Vitamin D	—
Vitamin E	1% RDA
Vitamin K	4% RDA
Thiamin	7% RDA

Riboflavin	12% RDA
Niacin	30% RDA
Vitamin B6	6% RDA
Folate	5% RDA
Vitamin B12	39% RDA
Pantothenic Acid	7% RDA
Calcium	2% RDA
Iron	9% RDA
Magnesium	5% RDA
Phosphorus	16% RDA
Potassium	6% RDA
Sodium	2% RDA
Zinc	23% RDA
Copper	5% RDA
Manganese	1% RDA
Selenium	27% RDA

Benefits

Generally speaking, both lamb and mutton is very healthy.

- Because sheep graze on pasture all day, the omega 6 to 3 ratio is very low-and optimal-compared to other meats (20).

- Lamb contains a broad range of health-protective nutrients, especially zinc, selenium and B vitamins.

Concerns

- Lamb is very expensive in comparison to different kinds of meat.

4. Chicken



Alongside beef and pork, chicken is one of the ‘big three’ popularity-wise.

However, chicken is a different classification of meat and comes under the poultry category.

People commonly refer to as ‘white meat’ rather than red.

As one of the most popular foods in the world, there are all sorts of chicken-based foods. These range from fried and roasted chicken to chicken soup and even chicken popcorn.

For health purposes, it is better to avoid the more processed of these options.

Nutrition Facts

Ground chicken meat provides the following nutrients per 100g (21);

Nutrient	Amount
Calories	143 Kcals
Carbohydrate	0 g
Protein	17.4 g
Fat	8.1 g
– Saturated	2.3 g
– Monounsaturated	3.6 g
– Polyunsaturated	1.5 g

– Omega-3	96 mg
– Omega-6	1327 mg
Omega 6 to 3 Ratio	13.8 : 1
Vitamin A	0% RDA
Vitamin C	0% RDA
Vitamin D	–
Vitamin E	1% RDA
Vitamin K	1% RDA
Thiamin	7% RDA
Riboflavin	14% RDA
Niacin	22% RDA
Vitamin B6	19% RDA
Folate	1% RDA
Vitamin B12	14% RDA
Pantothenic Acid	11% RDA
Calcium	1% RDA
Iron	5% RDA
Magnesium	5% RDA
Phosphorus	18% RDA
Potassium	15% RDA
Sodium	3% RDA
Zinc	10% RDA
Copper	3% RDA
Manganese	1% RDA
Selenium	15% RDA

Benefits

- Chicken is very cheap and easily affordable.
- For those who are trying to consume less fat/calories, chicken offers a smaller amount than other meats but with the same protein content.
- Chicken stock/broth offers a significant source of gelatin. As chicken bones have a lower density than other meats, the collagen and gelatin are far easier to extract.
- Chicken provides a decent source of necessary vitamins and minerals, particularly selenium, potassium, phosphorus and B vitamins.

Concerns

- Due to commercial chicken feed—and similar to pork—chicken contains an excessive amount of omega-6. Whether this is problematic or not likely depends on the overall diet.
- Bacterial contamination with strains such as E. coli and salmonella is too common in chicken. As a result, strict hygiene procedures are necessary when handling the raw meat (22, 23).

5. Turkey



Turkey is another type of white meat, probably best known for its appearance at the Christmas table!

It has both a deeper yet drier taste than chicken and is a less prevalent form of poultry.

As mentioned above, the most popular kind is probably roast turkey, but you can find a variety of processed and unprocessed turkey products.

Nutrition Facts

Turkey's nutritional composition is very similar to chicken and looks like this (24);

Nutrient	Amount
Calories	149 Kcals
Carbohydrate	0 g
Protein	17.5 g
Fat	8.3 g
– Saturated	2.3 g
– Monounsaturated	3.1 g
– Polyunsaturated	2.0 g
– Omega-3	110 mg
– Omega-6	1800 mg
Omega 6 to 3 Ratio	16.3 : 1
Vitamin A	0% RDA
Vitamin C	0% RDA
Vitamin D	—
Vitamin E	2% RDA
Vitamin K	1% RDA
Thiamin	4% RDA
Riboflavin	8% RDA
Niacin	17% RDA
Vitamin B6	18% RDA
Folate	2% RDA
Vitamin B12	6% RDA
Pantothenic Acid	7% RDA
Calcium	1% RDA

Iron	7% RDA
Magnesium	5% RDA
Phosphorus	16% RDA
Potassium	7% RDA
Sodium	4% RDA
Zinc	13% RDA
Copper	4% RDA
Manganese	1% RDA
Selenium	27% RDA

Benefits

- Turkey is among the most protein-dense of all meats, offering 17.5 grams of protein in only 149 calories.
- Similar to chicken, turkey also provides a significant amount of B vitamins, potassium, selenium and phosphorus.
- Turkey provides an inexpensive source of high-quality protein.

Concerns

- Similar to other forms of poultry, turkey is more likely to harbor foodborne bacteria than red meat ([25](#)).

6. Venison



Venison refers to the flesh of a deer, and it is a traditionally rarer type of meat.

In recent years, sales of venison have been soaring as a result of its healthy reputation among consumers.

But is that reputation justified?

Nutrition Facts

Despite it being a red meat, venison is very lean. In terms of nutrition, it looks more like white meat.

Here are the nutritional details per 100g of ground venison (26);

Nutrient	Amount
Calories	157 Kcals
Carbohydrate	0 g
Protein	21.8 g
Fat	7.1 g
– Saturated	3.4 g
– Monounsaturated	1.3 g
– Polyunsaturated	0.4 g
– Omega-3	104 mg
– Omega-6	225 mg
Omega 6 to 3 Ratio	2 : 1
Vitamin A	0% RDA
Vitamin C	0% RDA
Vitamin D	—
Vitamin E	2% RDA
Vitamin K	1% RDA
Thiamin	36% RDA
Riboflavin	17% RDA
Niacin	28% RDA

Vitamin B6	23% RDA
Folate	1% RDA
Vitamin B12	31% RDA
Pantothenic Acid	7% RDA
Calcium	1% RDA
Iron	16% RDA
Magnesium	5% RDA
Phosphorus	20% RDA
Potassium	9% RDA
Sodium	3% RDA
Zinc	28% RDA
Copper	7% RDA
Manganese	1% RDA
Selenium	14% RDA

Benefits

- As deer live and feed in the wild, venison is one of the healthiest and most natural varieties of meat. The excellent omega 6 to 3 ratio (2:1) shows the benefits of an animal living on a natural diet.

- Venison has **more** vitamins and minerals than beef despite having significantly **fewer** calories. In short, venison is possibly the most nutrient-dense meat out there.

Concerns

- One obstacle could be the price; venison costs a lot. Expect to pay around \$30 for one pound of venison steak.

- Some deer are infected with chronic wasting disease (CWD). See this [full guide to venison meat](#) for more information.

7. Duck



Duck is one of the less popular types of meat.

However, it has immense popularity in Chinese populations, where ‘Peking duck’ is a showpiece dish.

Like chicken and turkey, we can consider duck as a kind of white meat.

Nutrition Facts

Typical duck meat provides the following nutrients (27);

Nutrient	Amount
Calories	132 Kcals
Carbohydrate	0 g
Protein	18.3 g
Fat	5.9 g
– Saturated	2.3 g
– Monounsaturated	1.5 g
– Polyunsaturated	0.7 g
– Omega-3	80 mg
– Omega-6	670 mg
Omega 6 to 3 Ratio	8.4 : 1

Vitamin A	2%
Vitamin C	10% RDA
Vitamin D	—
Vitamin E	4%
Vitamin K	3%
Thiamin	24% RDA
Riboflavin	0.5% RDA
Niacin	5.3% RDA
Vitamin B6	17% RDA
Folate	6% RDA
Vitamin B12	7% RDA
Pantothenic Acid	16% RDA
Calcium	1% RDA
Iron	13% RDA
Magnesium	5% RDA
Phosphorus	20% RDA
Potassium	8% RDA
Sodium	3% RDA
Zinc	13% RDA
Copper	13% RDA
Manganese	1% RDA
Selenium	20% RDA

Benefits

- Duck provides a significant amount of selenium, phosphorus, and B vitamins. These vitamins are all important for optimal energy production and a well-functioning immune system ([28](#), [29](#)).

Concerns

- Making duck at home—or having a roast duck—is perfectly healthy. However, be aware that in Chinese cuisine, duck often comes in sauces made from a variety of additives including sugars, oils, and monosodium glutamate (MSG).

8. Wild Boar



Wild boar is a non-domesticated pig that lives in the wild.

The meat of this animal is also known as ‘wild boar.’

Generally speaking, wild boar contains a higher proportion of protein and a smaller amount of fat than regular pork.

Nutrition Facts

Wild boar has very different nutritional values from domestic pork, and per 100g it looks like this (30);

Nutrient	Amount
Calories	160 Kcals
Carbohydrate	0 g
Protein	28.3 g
Fat	4.4 g
– Saturated	1.3 g
– Monounsaturated	1.7 g

– Polyunsaturated	0.6 g
– Omega-3	30 mg
– Omega-6	500 mg
Omega 6 to 3 Ratio	16.7 : 1
Vitamin A	0% RDA
Vitamin C	0% RDA
Vitamin D	–
Vitamin E	–
Vitamin K	2% RDA
Thiamin	21% RDA
Riboflavin	8% RDA
Niacin	21% RDA
Vitamin B6	21% RDA
Folate	1% RDA
Vitamin B12	12% RDA
Pantothenic Acid	0% RDA
Calcium	2% RDA
Iron	6% RDA
Magnesium	7% RDA
Phosphorus	13% RDA
Potassium	11% RDA
Sodium	3% RDA
Zinc	20% RDA
Copper	3% RDA
Manganese	0% RDA
Selenium	19% RDA

Benefits

- As it lives and feeds in its natural environment, wild boar contains a higher proportion of omega-3 fatty acids.
- Wild boar contains an array of health-protective nutrients, in particularly B vitamins, selenium, and zinc.

Concerns

- Despite containing a higher amount of omega-3, the omega-6 to omega-3 ratio is still very high.
- *Trichinella spiralis*, a parasite sometimes found in pigs, occasionally contaminates wild boar meat. There have been several outbreaks of this in recent years, but it is very rare ([31](#), [32](#), [33](#)).

Omega-6 to Omega-3 Ratio By Variety of Meat

One of the biggest trends over the past decade is the focus on naturally raised, grass-fed beef and pastured animal products.

Perhaps the main reason why relates to the omega 6 to 3 ratio of the meat.

In the past, the traditional human diet was believed to be close to a ratio of 1:1 omega-6 to omega-3. However, modern-day estimates place this ratio up to a high of 25:1, which is pro-inflammatory ([34](#)).

For easy reference, here are the omega-6 to 3 ratios for all the meats in this article;

Type of Meat	Omega-6 to Omega-3 Ratio
Beef	9: 1
Chicken	13.8: 1
Duck	8.4: 1
Lamb and Mutton	3.2: 1
Pork	23.8: 1
Turkey	16.3: 1
Venison	2: 1
Wild Boar	16.7: 1

Please note that these are for conventional meats and you can expect a better ratio for grass-fed meat.

The amount will also vary depending on what producers feed the animals.

UNIT 3

MEAT PROCESSING

1. *Выучите новые слова*

alteration - 1) изменение, переделка; 2) деформация

casing - оболочка для колбасных изделий

coarse - 1) сырой, необработанный; 2) крупнозернистый; 3) жёсткий (о мясе)

chip - тонкий кусочек, ломтик

chopping - измельчение, рубка

chunk - 1) большой кусок; 2) короткий колбасный батон

comminuted meat products - продукты из мясного фарша

corned beef - говяжья солонина

cured ham - солёный окорок; копчёный окорок

to distinguish - различать, характеризовать

emulsified sausages - колбаса эмульсионного типа (из футерованного фарша с добавлением белков и белковых препаратов)

grinding - измельчение, дробление

intact - неповреждённый, целый

molded products - формовые продукты

pasteurize – пастеризовать

patty (*pl. patties*) - котлета

preparation - 1) подготовка, предварительная обработка; 2) приготовление

prior - 1) прежний, предшествующий; 2) более важный

processed meat products - мясные продукты, подвергшиеся технологической обработке

sausage - 1) колбаса; 2) сосиска, сарделька; 3) колбасный фарш

seasoning - приправа, заправка пряностями
smoked meats - копчёные мясные продукты
stuffing - шприцевание, фарширование
to subdivide - подразделять

2. Прочитайте и переведите со словарём текст и ответьте на вопросы:

1. Как классифицируются мясные продукты после технологической обработки?
2. Что лежит в основе классификации колбас на категории?

Text 1. Processed Meat Products

Processed meat products are defined as those in which the properties of fresh meat have been modified by the use of one or more procedures, such as grinding or chopping, addition of seasonings, alteration of color, or heat treatment. Typical processed meat products include items such as cured ham, bacon, corned beef, and an almost endless variety of sausages. Most of these products are subjected to a combination of several basic processing steps before reaching their final form. Most products undergo certain basic processing steps in common. Although each processed product has its own specific characteristics and methods of preparation, they all can be classified as either *comminuted* or *noncomminuted* products.

Typical noncomminuted products include hams of all types, bacons, and corned beef. In the meat industry, many of these products are commonly referred to as *smoked meats*. Their distinguishing characteristic is that they are prepared from whole, intact cuts of meat (with the bone removed in some cases). These products usually are cured, seasoned, heat processed and smoked, and often they are molded or formed.

Comminution involves subdividing the raw meat materials, so that the product consists of small meat pieces, chunks, chips, or slices. Most comminuted products may be classed as sausages. *Sausages* are comminuted, seasoned meat products that may also be cured, smoked, molded, and heat processed. The degree of comminution varies widely. Some sausages are very coarsely comminuted; examples are salami,

pork sausage, and summer sausage. In other sausages, the meat can be so finely subdivided that the sausage mix is a viscous mass with many characteristics of an emulsion. These are referred to as *emulsified sausages*; examples are frankfurters and bologna. All sausages can be classified into one of six categories, depending upon the processing methods that are used in their manufacture. The six classes, and examples of each, are: (1) *fresh* - fresh pork sausage; (2) *uncooked, smoked* - smoked pork sausage, mettwurst, Italian pork sausage; (3) *cooked, smoked* - frankfurter, bologna, knackwurst, mortadella, berliner; (4) *cooked* - liver sausage, braunschweiger, beer salami, cooked salami; (5) *dry or fermented* - summer sausage, cervelat, dry salamis, cappicola, pepperoni; and (6) *cooked meat specialties* - luncheon meats and loaves, sandwich spreads, jellied products.

There are also many comminuted products that are not classed as sausages. Hamburger and ground beef are probably the most common.

Most processed meat products are formed at some point in processing, in order to give each product a uniform or characteristic shape. Since sausages are comminuted products, they must be placed in some type of forming device or covering to give them shape, to hold them together during further processing, and for protection.

Many noncomminuted smoked meat products are also formed during processing. In general, these meat products are formed in either *molds* or *casings*. Metal molds are often used for loaf type items that are sliced prior to merchandising. Casings are more widely used as forms and containers for sausages. The process of placing meat products, either comminuted or noncomminuted, into casings is referred to as *stuffing*. Two types of casings are in general use: (1) natural, and (2) manufactured.

3. Найдите среди слов под буквами а, б, с синонимы к словам, приведённым в левой колонке.

	a	b	c
1. to have	to retain	to possess	to produce
2. to cover	to convey	to provide	to spread
3. to place	to apply	to store	to put

4. to hold	to keep	to cut	to class
5. method	process	technique	factor
6. several	most	some	other
7. prior	after	next	before
8. container	slice	holder	device

4. Найдите среди слов под буквами а, в, с слова с противоположным значением по отношению к словам из левой колонки

1. natural	a	b	c
2. various	similar	delicate	artificial
3. before	since	thick	common
4. specific	minor	typical	about
5. typical	endless	unusual	protected
6. fresh	chilled	spoiled	cured
7. dry	widely	rapidly	seasoned
8. slowly	hot	cold	quickly
9. raw	smoked	after	cooked

5. Определите предложения, которые соответствуют содержанию текста 1и подтвердите свои ответы фактами из текста.

1. Canned hams require refrigeration.
2. Many processed products do not fit the classes of sausages.
3. Smoked meats are prepared from intact cuts of meat.
4. It is apparent that processed meat products take many shapes, sizes, and varieties.
5. Grinders are usually employed for the first step in the comminuting of sausage type products.
6. Categories of sausages do not depend upon the processing methods.

6. Заполните таблицу названиями колбас в соответствии с категорией

fresh	uncooked smoked	cooked smoked	cooked	dry or fermented	cooked meat specialties

7. ***Ответьте на следующие вопросы к тексту 1.***

1. What procedures are used for processing meat products?
2. What is the classification of all processed meat products?
3. What are typical processed meat products?
4. Are certain basic processing steps common for most meat products?
5. What is the distinguishing characteristic of smoked meats?
6. Does the degree of sausage comminution vary widely?
7. What are the examples of very coarsely comminuted sausages?
8. Why are most processed meat products formed at some point in processing?
9. Is stuffing the process of placing meat products into casing?
10. What casings are mentioned in the text?

8. ***Прочитайте текст 2. Обозначьте основные технологические приёмы переработки мяса. Каковы преимущества технологического процесса измельчения мяса? Для чего проводят дополнительное смешивание (blending)?***

Text 2. Basic Processing Procedures

Curing. Meat curing is the application of salt, color fixing ingredients, and seasonings to meat in order to impart unique properties to the end product. Cured meat products were originally prepared by the addition of salt at concentrations that were high enough to preserve the meat. Salt inhibits spoiling largely by reducing the amount of water available for microbial growth. Since a high salt concentration promotes oxidation of myoglobin molecules, meat preserved by salting has an unattractive gray color. The use of nitrate to “fix” the red color of cured meat probably evolved more by accident than by design. With the development of refrigeration and freezing and their application to the preservation of meat, the main purpose of meat curing changed from preservation to the development of unique color, flavor, texture, and palatability properties. The most notable difference between present day cured meats and those of the past is the lower salt level and

blander flavor of the modern product. Today, color development is equally as important as flavor and texture changes.

Two main ingredients must be used in order to cure meat; *salt*, and *nitrite*. Salt is included in all meat curing formulas. Its main function is as a flavoring agent. Nitrite is used to develop cured meat color. They impart a bright reddish pink color, which is desirable in a cured product. Alkaline *phosphates* are often incorporated into curing mixtures. They do increase the water binding capacity of meat and reduce shrinkage of meat products during subsequent processing. Phosphates also retard development of oxidative rancidity, and may improve texture. *Seasonings*, including spices, herbs, vegetables, and sweeteners, are often incorporated in meat along with curing ingredients. They do not enter into the curing reaction, but do impart unique flavors.

Commination. The process by which particle size is reduced for incorporation of meat into sausage type products is called *commination*. The degree of commination (or particle size) differs greatly between various processed products, and is often a unique characteristic of a particular product. Some items are very coarsely comminuted, but other products are so finely divided that they form a meat emulsion. Two main advantages are gained from all commination processes. These are an improved uniformity of product due to a more uniform particle size, distribution of ingredients, and an increase in tenderness as the meat is subdivided into smaller particles.

Blending. As a separate processing step, *blending* refers to an additional mixing to which comminuted products are subjected prior to further processing. The purpose of a separate blending step is to insure a more uniform distribution of ingredients, especially of the cure and seasoning, than could be achieved just with grinding. Coarsely ground sausages are blended prior to being stuffed into casings. Large batch blending of meat, seasonings, and other ingredients is a common procedure prior to emulsification.

Emulsification. An *emulsion* is defined as a mixture of two immiscible liquids, one of which is dispersed in the form of small droplets or globules in the other liquid. Meat emulsions are a two- phase system, with the dispersed phase consisting of either solid or liquid fat particles, and the continuous phase being water containing

dissolved and suspended salts and proteins. Thus, they can be classified as oil in water emulsions. Emulsions are generally unstable unless another component, known as an *emulsifying* or *stabilizing agent* is present. An emulsifying agent functions to reduce the interfacial tension. A distinguishing characteristic of emulsifying agents is that their molecules have an affinity for both water and fat.

9. Ответьте на следующие вопросы

1. What is the role of salt in curing meat?
2. What is the most notable difference between present day cured meats and those of the past?
3. Is reddish pink color desirable in a cured product?
4. Which of the two ingredients, salt or nitrite, develops cured meat color?
5. Seasonings are incorporated in meat along with curing ingredients, aren't they?
6. Curing mixtures include other ingredients. Name them. What are their functions during processing?
7. What is meat emulsion?

10. Назовите предложения, соответствующие содержанию текста

1. "Bone sour" in hams and gray areas in the interior of the products are examples of improper distribution of the curing mixture.
2. Cure ingredients are incorporating into sausage products during the mixing process.
3. The major use of nitrite in foods is in meat curing.
4. The degree of comminution is often a unique characteristic of a particular product.
5. To insure a more uniform distribution of ingredients is the purpose of additional mixing.
6. When fat is in contact with water there is a high interfacial tension between two phases.
7. During emulsification, fat that is present in the meat ingredients must be subdivided into smaller and smaller particles.

Note: "Bone sour" - загар (закисание) мяса у кости.

11. Прочитайте три части текста. Озаглавьте каждую из них и скажите, какие из них дополняют информацию текстов 1 и 2

Traditional methods of smoking and curing meat and fish produce foods with their own distinctive flavor and characteristics. Meats were traditionally either rubbed with salt - “dry cure” - or immersed in a solution of brine, salt and water - “wet cure”. Fish is also brined or pickled, often prior to smoking, which then gives the effect of kippering. These processes alter the water balance of foods by osmotic changes. Water is drawn into the food from the brining solution and subsequently increases overall weight.

In the past, traditional “dry” curing methods produced a cured meat of variable quality. Today curing is mainly of the “wet” cure type. Curing brine can contain nitrites and polyphosphates and a whole range of additives. When wet curing was first introduced, whole sides of pork were immersed and left to soak in the curing brines. Today, sets of needles - up to six rows with a hundred of needles - inject the solutions into the meat. Cured meat products made by the “wet” curing method have a higher water content than “dry” cured meats.

1. Meat processing originated in prehistoric times, and no doubt developed soon after people became hunters. Probably the first type of processed product was sun dried meat, and only later was meat dried over a slow burning wood fire to give a dried, smoked meat similar to jerky. The salting and smoking of meat was an ancient practice even in the time of Homer, 850 B.C. These early processed meat products were prepared for one purpose, their preservation for use at some future time. People had learned at a very early time that dried or heavily salted meat would not spoil as easily as the fresh product. Meat processing probably developed out of this knowledge, coupled with the necessity for storing meat for future use. Reasons for preparation of modern processed meat products include development of unique flavors and forms of product, provision of a variety of products, and development of new products in addition to preservation of meat.

Many of our present-day meat products were known to the ancient Egyptians and Romans. Roman butchers prepared cracklings, bacon, tenderloins, oxtails, pigs feet, salt

pork, meat balls, and sausage of many varieties. A book dating from the reign of Augustus (63 B.C.-14 A.D.) contains directions for the preservation of meat with honey (using no salt), and for the preservation of cooked meats in a brine solution containing water, mustard, vinegar, salt, and honey. Recipes are also given for liver sausage, pork sausage, and for a “round” sausage of chopped pork, bacon, garlic, onions, and pepper that was stuffed in a casing and smoked until the meat was pink.

2. Seasoning is a general term applied to any ingredient that is added to improve or modify the flavor of processed meat products. Thus, the obvious reason for incorporation of seasonings into processed meat products is to create distinctive flavors. In addition to flavor, seasonings contribute somewhat to the preservation of meat.

Salt and pepper form the basis for sausage seasoning formulas. All other seasoning ingredients are supplementary to salt and pepper, but are very necessary to obtain the distinctive flavor associated with various products. These seasonings include spices, herbs, vegetables, sweeteners, and other ingredients, such as monosodium glutamate, that contribute to flavor enhancement. *Spices* are aromatic substances of vegetable origin. Herbs are the dried leaves of plants, and those used in sausages include sage, savory, thyme, and marjoram. Seasonings originating from vegetable bulbs are onion and garlic. Since all seasonings are natural products, they are quite variable in flavor, strength, and quality. Thus, a large amount of experience is necessary for the proper selection of natural seasonings for use in processed meat. Natural seasonings can be used whole. The most finely ground spices are preferred because they disperse more completely in the product, are invisible, and do not detract from product appearance. The most commonly used seasonings are: garlic, onion, pepper, mustard, cardamom, ginger, cinnamon, coriander, thyme, savory, etc.

12. Переведите часть 1 с помощью словаря.

13. Обсудите информацию части текста 2 в парной беседе. Для этого составьте 5-6 вопросов и задайте их своему товарищу.

14. Ответьте на вопросы к части 3.

1. What is the reason for incorporation of seasonings into processed meat products?

2. What ingredients form the basis for sausage seasoning formulas?
3. Is it necessary to have an experience for the proper selection of natural seasonings?
4. Why are spices preferred to be finely ground?
5. Name the spices and aromatic substances most commonly used in processed meat products.

15. Прочтите текст и обсудите:

а) почему копчение и использование тепла при технологической обработке мясных продуктов происходят чаще всего одновременно? какие схожие изменения в продуктах происходят при копчении и обработке теплом?

б) каковы составляющие древесного дыма. Какое влияние они оказывают на вкусовые качества копчёного мяса?

Слова для понимания текста С

simultaneously - одновременно

succession - последовательность

to accomplish - выполнять, завершать sufficient - достаточный

to extend - удлинять (срок)

denaturation - денатурация, изменение естественных свойств

rigid structure - жёсткая структура

to fix - укреплять, сгущать, связывать

to expose - подвергать действию

wood smoke - древесный дым

to account for - объяснять что-либо

to retard - замедлять

onset - начало

rancidity - прогорклость

interstitial - промежуточный

penetrate - проникать

attractive - привлекательный

accrue (from) - происходить

Text 3. Smoking, Heat Processing and Dehydration

The smoking and heating (cooking) of processed meats can be considered as two separate processing steps. They are discussed together since, in most products, the two processes occur simultaneously or in immediate succession, so that variables in one process affect the other. In modern processing methods, the same facilities are used to accomplish both processes. Most products are both smoked and cooked (frankfurters, bologna, and many hams). However, a few products are only smoked with a minimum of heating (mettwurst, some Polish sausage, and bacon) while others are cooked but not smoked (liver sausage).

Heat Processing. Typical heat processed meat products are cooked until internal temperatures of 65-75 °C are reached. This is sufficient to kill most of the microorganisms present. The product is thereby pasteurized, and its shelf life significantly extended. Pasteurization is one important function of heat processing.

In addition to pasteurization, other important changes result from heat processing. Of special significance is the firm, set structure that develops as a result of protein denaturation, coagulation, and partial dehydration. For example, an emulsified product stuffed into a cellulose casing has no definite shape. The hardening and firming that occurs during cooking sets the structure so that, when the casing is removed, the product's shape and form is retained. Similar changes occurring in smoked meat products, such as hams, give the product a more rigid structure, so that their shapes are retained during further handling, packaging, and distribution. Textural changes, increased tenderness, and browning also occur during heating. A third important purpose of heat processing is to fix the cured meat pigment by the denaturation of nitric oxide myoglobin. Meat inspection regulations require that products labeled as cooked (ready to eat hams, luncheon meat, frankfurters, and many others) must be heated to an internal temperature of 65-68 °C.

Smoking. The smoking of meat is the process of exposing a product to wood smoke at some point during its manufacture. Smoking methods originated simply as a result of meat being dried over wood fires. The development of specific flavors, and the improvement of appearance are the main reasons for smoking meat today, even

though smoking provides a preservative effect. More than 200 individual compounds have been identified in wood smoke. It is believed that formaldehyde accounts for most of the preservative action of smoke. In addition, phenols also have an antioxidant activity that retards the onset of oxidative rancidity. All of the compounds listed above probably contribute to the characteristic flavor of smoked meat.

In most present day processed meats, smoking contributes little, if any, preservative action. Smoke components are absorbed by surface and interstitial water in the product, but in no case do they penetrate more than a few millimeters. The present day purpose of smoking meat is mainly to develop a distinctive flavor and a surface appearance that is attractive to the consumer. However, a few other advantages do accrue from the smoking of meats. For example, it aids in the development of a smooth surface or skin beneath the cellulose casing of frankfurters that facilitates peeling of the casing prior to packaging.

Dehydration. Dehydration of meat products is one of the several basic processing steps. However, few meat products are dehydrated as a separate process. In those cases where drying is a separate step, the objective is primarily preservation. Drying to preserve the product can be accomplished by freeze dehydration or by the application of heat. In many meat products with a reduced moisture content, drying occurs simultaneously with the next processing step - aging.

16. Прочитайте и переведите текст «Heat Processing», «Smoking» и сформулируйте мысль о главных целях технологической обработки мясных продуктов с использованием тепла и процесса копчения.

17. Подготовьте аннотацию текста 3.

UNIT 4

METHODS OF STORING AND PRESERVING MEAT

1. Прочитайте следующие слова, расположенные в алфавитном порядке, и найдите в тексте А предложения с данными словами. Постарайтесь запомнить новые для вас слова.

blast [bla:st] - поток (струя) воздуха

air blast - интенсивный поток воздуха

cabinet - шкаф

cook - варить, подвергать тепловой обработке

cryogenics - криогенная техника; техника низких температур

cryogenic - криогенный

deteriorate – ухудшать (ся); портить (ся)

fan - вентилятор

freeze (froze, frozen) - замораживать

humidity - влажность

immerse - погружать

means - средство, способ

medium - среда

plate - пластина, тарелка, лист

preserve - предохранять от порчи, консервировать

prolong - продлевать

retain - сохранять (качества/свойства без изменений)

shelf (*pl.* shelves) - полка, стеллаж

shelf (storage) life - продолжительность хранения, срок годности при хранении, срок сохранности (продукта)

spray - струя, распыление; распылять, разбрызгивать

storage - хранение; склад; хранилище store - хранить на складе

transfer - перенос, передача heat transfer - теплопередача, теплообмен

tray - лоток, поддон undesirable – нежелательный

undesirable – нежелательный

2. Прочитайте текст и назовите существующие способы сохранения мяса от порчи.

Methods of Storing and Preserving Meat

Preservation is absolutely essential for prolonging shelf life, and for the storage

of all fresh meat and most processed meat products. The most common method of preservation is the use of refrigeration. The term “refrigeration” here is confined to the use of temperatures between 2 and 5 °C for the storage of meat. Almost all fresh meat is stored under such refrigeration. Refrigeration usually begins with the chilling of carcasses shortly after slaughter. It continues through their storage, breaking, transit, fabrication, retail cut display, and storage of these cuts in the consumer's refrigerator. Most processed meat products are also handled under refrigeration temperatures from the time of final processing until consumption.

The refrigerated storage of meat and meat products is generally limited to relatively short periods of time. The major factors that influence the storage life of meat under refrigeration include the initial microbial load, the temperature and humidity conditions during storage, the presence or absence of protective coverings, the species of animal, and the type of product being stored.

Freezing is an excellent method for the preservation of meat. It results in less undesirable changes in the qualitative and organoleptic properties of meat than the other methods of preservation. Most of the nutritive value of meat is retained during freezing, and through the period of frozen storage. The only loss in nutritive value occurs when some of the water-soluble nutrients are lost in the drip during thawing. When proper freezing and storage methods are used, there is little change in the color, flavor, odor, or juiciness of cooked meat products. Thus, the qualitative properties of frozen meat approximate that of fresh meat. Commercially, several methods are used to freeze meat products including: (1) still air, (2) plate freezing, (3) cold air blast, (4) liquid immersion and liquid sprays, and (5) cryogenic freezing.

Still air. In the still air freezing method, air is the heat transfer medium. This method of freezing is entirely dependent upon convection, and meat freezes very slowly. Home freezer units, as well as the refrigerator freezer, operate on the principle of still air freezing. Commercial temperatures commonly used in still air freezing range from about -10 °C to -30 °C.

Plate freezing. The heat transferring medium in this freezing method is metal. Trays containing the products, or the flat surfaces of meat products are placed

directly in contact with the metal freezer plates or shelves. Plate freezer temperatures usually range from about -10 °C to -30 °C, and the method is generally limited to thin pieces of meat (such as steaks, chops, fillets, and patties).

Blast freezing. The most commonly used method for freezing meat products is cold air blast freezing in rooms or tunnels that are equipped with fans to provide rapid air movement. Air is the medium of heat transfer, but because of its rapid movement the rate of heat transfer is greatly increased over that in still air, and thus the rate of freezing is markedly increased. The proper spacing and stacking of meat products on pallets, or on shelved racks, in the blast freezer room is important for rapid and efficient freezing. In blast tunnels, the meat products to be frozen are placed on moving metal mesh belts or conveyor system and passed through the tunnel.

Liquid immersion and liquid sprays. Liquid immersion or spray is the most widely used commercial method for freezing poultry. However, some red meat products, and fish, are also frozen by this method. Higher temperatures are generally used than in blast freezing.

The products to be frozen are placed in plastic bags, stacked on pallets or in shelved racks, and then either immersed into the freezing liquid or moved through the cold liquid by a conveyor. In another application, the product is conveyed through an enclosed freezing cabinet while the cold liquid is continuously sprayed on its surface.

Cryogenic freezing. Any one of three systems may be used for cryogenic freezing. These are direct immersion, liquid spray, or the circulation of the cryogenic agent vapor over the product to be frozen. The most commonly used cryogenic agents are nitrogen and carbon dioxide.

Because of the excellent qualitative properties of meat products frozen by these methods, they are gaining in acceptance.

3. Read and translate the text

Text 10. Preservation and Storage Meat

The usual methods of preserving meat from bacteria and decay are refrigerating, freezing, drying, freeze-drying, and canning. Meats are marketed as

fresh or processed goods or become ingredients of various meat products, including many types of sausages and luncheon meats. They also yield a number of important by-products. Meat preservation helps to control spoilage by inhibiting the growth of microorganisms, slowing enzymatic activity, and preventing the oxidation of fatty acids that promote rancidity. There are many factors affecting the length of time meat products can be stored while maintaining product safety and quality. The physical state of meat plays a role in the number of microorganisms that can grow on meat. For example, grinding meat increases the surface area, releases moisture and nutrients from the muscle fibres, and distributes surface microorganisms throughout the meat. Chemical properties of meat, such as pH and moisture content, affect the ability of microorganisms to grow on meat. Natural protective tissues (fat or skin) can prevent microbial contamination, dehydration, or other undesirable changes. Covering meats with paper or protective plastic films prevents excessive moisture loss and microbial contamination.

Cold storage Temperature is the most important factor influencing bacterial growth. Pathogenic bacteria do not grow well at temperatures under 3° C. Therefore, meat should be stored at temperatures that are as cold as possible. Refrigerated storage is the most common method of meat preservation. The typical refrigerated storage life for fresh meats is 5 to 7 days. Freezer storage is an excellent method of meat preservation. It is important to wrap frozen meats closely in packaging that limits air contact with the meat in order to prevent moisture loss during storage. The length of time meats are held at frozen storage also determines product quality. Under typical freezer storage of -18° C beef can be stored for 6 to 12 months, lamb for 6 to 9 months, pork for 6 months, and sausage products for 2 months.

Freezing. The rate of freezing is very important in maintaining meat quality, rapid freezing being superior. If meats are frozen slowly, large ice crystals form in the meat and rupture cell membranes. When this meat is thawed, much of the original moisture found in the meat is lost as juice flows from the meat. For this reason cryogenic freezing (the use of super cold substances such as liquid nitrogen)

or other rapid methods of freezing meats are used at the commercial level to maintain maximal product quality. It is important to note, however, that freezing does not kill most microorganisms; they simply become dormant. When the meat is thawed, the spoilage continues where it left off.

Vacuum packaging. Oxygen is required for many bacteria to grow. For this reason most meats are vacuum-packaged, which extends the storage life under refrigerated conditions to approximately 100 days. In addition, vacuum packaging minimizes the oxidation of unsaturated fatty acids and slows the development of rancid meat.

Canning. The second most common method of meat preservation is canning. Canning involves sealing meat in a container and then heating it to destroy all microorganisms capable of food spoilage. Under normal conditions canned products can safely be stored at room temperature indefinitely. However, certain quality concerns can make producers or sellers recommend an optimal "sell by" date.

Drying. Drying is another common method of meat preservation. Drying removes moisture from meat products so that microorganisms cannot grow. Dry sausages, freeze-dried meats, and jerky products are all examples of dried meats capable of being stored at room temperature without rapid spoilage.

Fermentation. An ancient form of food preservation used in the meat industry is fermentation, which involves the addition of certain harmless bacteria to meat. These fermenting bacteria produce acid as they grow, lowering the pH of the meat and inhibiting the growth of many pathogenic microorganisms.

Irradiation. Irradiation, or radurization, is a pasteurization method accomplished by exposing meat to doses of radiation. Radurization is as effective as heat pasteurization in killing food-spoilage microorganisms. Irradiation of meat is accomplished by exposing meat to high-energy ionizing radiation produced either by electron accelerators or by exposure to gamma-radiation-emitting substances such as cobalt-60 or cesium-137. Irradiated products are virtually identical in character to nonirradiated products, but they have significantly lower microbial contamination. Irradiated fresh meat products still require refrigeration and

packaging to prevent spoilage, but the refrigerated storage life of these products is extended.

Curing and smoking. Meat curing and smoking are two of the oldest methods of meat preservation. They not only improve the safety and shelf life of meat products but also enhance the colour and flavour. Smoking of meat decreases the available moisture on the surface of meat products, preventing microbial growth and spoilage. Meat curing, as commonly performed in products such as ham or sausage, involves the addition of mixtures containing salt, nitrite, and other preservatives.

Salt decreases the moisture in meats available to spoilage microorganisms. Nitrite prevents microorganisms from growing and retards rancidity in meats. Nitrite also produces the pink colour associated with cured products by binding as nitric oxide) to myoglobin. However, the use of nitrite in meat products is controversial owing to its potential cancer-causing activity.

Sodium erythorbate or ascorbate is another common curing additive, which not only decreases the risks associated with the use of nitrite but also improves cured meat colour development. Other common additives include alkaline phosphates, which improve the juiciness of meat products by increasing their water-holding ability.



4. Ответьте по-русски на вопросы:

1) Какие методы хранения существуют?

- 2) Зачем нужен кислород при консервации?
- 3) Как называется самая древняя форма хранения продуктов?

5. Назовите эквиваленты следующих интернациональных слов:

Influencing bacterial growth, meat curing, irradiation of meat, radurization, dry sausages, oxygen, slowing enzymatic activity.

6. Вставьте вместо точек подходящие по смыслу слова:

1. Drying is another common method of the moisture is meats available to spoilage microorganisms.
2. Smoking of meat decreases the products, preventing microbial growth and spoilage.
3. ... is required for many bacteria to grow.
4. However, the ...products is controversial owing to its potential cancer-causing

7. Прочитайте и переведите текст

Text 1. Meat grading

Meat grading divides meat into different classes based on expected eating quality (e.g. appearance, tenderness, juiciness. and flavor) and expected yield of meat sold from a carcass. In contrast to meat-inspection procedures, meat-grading systems vary significantly throughout the world. These differences an due in large part to the fact that different countries have different meat quality standards. For example, in the United States cattle are raised primarily for the production of steaks and are fattened with high-quality grain feed in order to achieve a high amount of marbling throughout the muscles of the animal. High marbling levels are associated with meat cuts that are juicier, have more flavor, and are more tender. Therefore, greater marbling levels -and especially marbling that is finely textured and evenly distributed -improve the USDA (United States Department of Agriculture) quality grade (i.e., prime, choice, or select) of the beef. However, in Australia cattle are raised primarily

for the production of ground beef products, and the highest quality grades are given to the leanest cuts of meat. Some of the characteristics of meat used to assess quality and assign grades include: conformation of the carcass, thickness of external fat; color, texture, and firmness of the lean meat; color and shape of the bones; level of marbling.

8. Закончите предложения в соответствии с содержанием текста.

1. The most common method of prolonging the shelf life of meat is the use of...
 - a) *high temperatures*
 - b) *refrigeration*
 - c) *home freezer units*
2. The type of product being stored is one of the major factors that influence.
 - a) *the storage life of meat*
 - b) *humidity conditions during storage*
 - c) *rapid air movement in freezing tunnels*
3. In cryogenic freezing the heat transfer medium is ...
 - a) *air*
 - b) *metal*
 - c) *nitrogen or carbon dioxide*

9. Ответьте на вопросы к тексту.

1. What is preservation?
2. How is the term “refrigeration” defined?
3. Is only fresh meat stored under refrigeration?
4. Why is freezing recognized as an excellent method for preserving meat?
5. Most of the nutritive value of meat is retained during freezing, isn't it?
6. What are the common methods for freezing meat products?
7. Is the liquid immersion method used for freezing poultry or fish?

10. Составьте таблицу, указав в ней названия методов замораживания и название теплоносителя для каждого из них.

Метод замораживания	Теплоноситель

11. Составьте план пересказа текста 1. Выпишите ключевые слова к каждому пункту плана. Перескажите текст, пользуясь планом и ключевыми словами.

12. Прочитайте заголовок текста 2 и переведите его на русский язык. Просмотрите текст, обращая внимание на выделенные слова. Ответьте на вопросы:

- а) На каких принципах основана термообработка?
- б) Какие два основных вида термообработки применяют для сохранения мясных изделий?

13. Прочитайте и переведите текст.

Text 2. Thermal Processing

Heat processing, as a method of preservation, is used to *kill* spoilage and potentially toxic microorganisms in meat and meat products, and to inactivate endogenous enzymes that could cause deteriorative changes. This is in contrast to the refrigeration and freezing processes, which *slow* or *stop* microbial growth but generally do not kill microorganisms. Two general levels of heat processing are employed in meat preservation. A *moderate heating* process, where products reach temperatures of 58-75 °C, is employed in the cooking of most processed meat items. This heat treatment kills part, but not all, of the microorganisms present, and will inactivate other organisms. This process is referred to as *pasteurization*. The shelf life of meat products is extended by this pasteurization process, but they must still be stored under refrigeration after being processed. A more *severe heating*, generally to temperatures above 100 °C, is used to prepare “commercially sterile” meat products that are stable at room temperature for one or more years. This process is called *steri-*

lization. This treatment either kills all potential spoilage organisms, or causes sufficient damage to microbial cells so that growth is impossible. The palatability of meat generally decreases as it is heated to temperatures above those used for pasteurization.

Heat transfer. All conventional methods of thermal processing involve heat transfer by conduction, convection, and/or radiation. Heating by conduction involves the direct transfer of heat from particle to particle without the use of a medium other than the product itself. For example, the transfer of heat from the surface to the center of a solid piece of meat is almost entirely by conduction. Convection heating involves heat transfer by the mass movement of heated particles in a “fluid” such as air, steam, or water. Heating by radiation is the transfer of heat energy through space. One or more of these heat transfer mechanisms are involved in all of the procedures used to thermally process meat products.

It is important to consider the factors that affect the rate and extent of heating, as well as fundamental heating principles, when specific thermal processing schedules are developed for a meat product. However, meat products vary widely in amounts of fat, water content, consistency, and homogeneity, so that a calculation of exact processing schedules is virtually impossible. Thermal processing schedules usually must be developed on an individual product basis, and sometimes even on an individual plant basis, due to variations in specific equipment.

Heat resistance of microorganisms. Cells and spores of microorganisms differ widely in their resistance to high temperatures. Some of these differences are the result of factors that can be controlled, and others are due to characteristics of the organism that cannot be controlled. Factors that are known to affect the heat resistance of cells and spores must be considered when thermal processes for the destruction of microorganisms are developed for, or applied to, the production of meat products.

Methods of thermal processing. The commercial heat processing of canned products (such as canned hams and luncheon meat) to pasteurization temperatures is generally done by immersing the sealed cans in water that is heated in open kettles or

vats. The water temperature is usually less than 100 °C under these conditions, but higher temperatures can be reached by adding salts, such as calcium or sodium chlorides, to increase the boiling point. Heating in open kettles is not recommended for the production of commercially sterile products because of the extremely long processing times required, and the danger of inadequate heat treatment in these meat products.

Thermal processing to achieve sterility is usually done in large metal drums, known as retorts, which are capable of withstanding pressures of up to 32 kg/cm². The sealed cans are placed in the retort, which is then closed, sealed, and heated. Heat is applied by heating water under pressure, or by injecting superheated steam, or a mixture of steam and air. Temperatures of 120 °C or higher are routinely achieved in the retort, which greatly reduces processing time over the open kettle method. In addition, the cans are often agitated, in order to further shorten the processing time.

14. Найдите в тексте 2 ответы на следующие вопросы.

1. Does heat processing as a method of preservation kill spoilage and toxic microorganisms in meat?
2. What method of preservation merely slows or stops microbial growth?
3. Which process is a severe heating, pasteurization or sterilization?
4. What is the main difference between sterilizing and pasteurizing processes?
5. What principles are all conventional methods of thermal processing based upon?
6. How is generally pasteurization of canned meats done?
7. When are large metal drums, known as retorts, used?

15. Отметьте предложения, соответствующие содержанию текста 2.

1. Three general levels of heat processing are employed in meat preservation.
2. A moderate heating process kills all microorganisms present in meat.

3. Pasteurized meat products must be stored under refrigeration after being processed.

4. Heating by radiation is the transfer of heat energy through space.

It is important to consider fundamental heating principles when thermal processing schedules are developed for a meat product.

5. Thermal processing to achieve sterility is usually done in open vats.

6. Temperatures of 120 °C or higher are commonly achieved in the retort.

16. Прочитайте три части текста. Озаглавьте каждую часть и скажите, какие из них дополняют информацию текстов 1 и 2.

1. Once, the manufacture of meat products was strictly an art handed down from generation to generation. Today, the development of new products and the improvement of old ones is a science. Major research programs in Meat Science are being carried on at universities, research institutes, and government research facilities in this country and abroad. Because of this research effort, the past decade has seen a tremendous expansion of the basic science of meat as a food. Since many basic questions remain unanswered, and new technical problems frequently arise, there is still much fertile ground to be plowed by the imaginative scientist. Meat Science is a broad field of study, an important part of which is the basic study of the unique characteristics of muscle and the other animal tissues that are used as meat. A complete understanding of the basic properties of the tissues used in meat can lead to improved utilization and better meat products. Meat Science is not limited to the study of tissues. It includes all facets of the meat industry, beginning with animal production and ending with final preparation for consumption. Breeding, feeding, and management are extremely important parts of the food chain because quality control actually starts on the farm, ranch, or feedlot.

2. The thawing process probably does greater damage to meat than freezing. Several factors are largely responsible for the damaging effects that occur during thawing. First of all, thawing occurs more slowly than freezing, even when the temperature differential is the same. However, the temperature differential in thawing is

generally much less in practice than that encountered in freezing. Secondly, during thawing the temperature rises rapidly to the freezing point, but then remains there throughout the entire course of thawing. This situation further increases the length of the thawing process, compared to freezing. The thawing process thus provides a greater opportunity for the formation of new, large ice crystals (recrystallization), for increased microbial growth, and for chemical changes. An additional potentially serious problem is that most thawing is done at the point of consumption by individuals who generally have little knowledge of the problems associated with thawing meat products. Meat products may be thawed in any of several ways: (1) in cold air, such as in the meat cooler or home refrigerator, (2) in warm air, (3) in water, or (4) during cooking, without prior thawing. The time required for thawing frozen meat products depends upon a number of factors. Among the more important of these factors are: (1) the temperature of the meat product, (2) the thermal capacity of the meat product (lean meat products have higher thermal capacities and therefore thaw more slowly than do fat meat products), (3) the size of the meat product, (4) the nature of the thawing medium (water provides faster heat transfer than air), (5) the temperature of the thawing medium, and (6) whether or not the thawing medium is circulated.

3. Hot air drying. Acceptable quality comminuted, cooked meat products can be produced by hot air drying. However, such factors as temperature, particle size, and the rate of air movement must be carefully controlled. Meat products dehydrated in this manner have a residual moisture content of about 5 percent. As a consequence, certain deteriorative changes can develop during prolonged storage. The fat, especially that of pork, tends to become rancid following hot air drying. This can be retarded either by the addition of antioxidants, or packaging the product in a manner that eliminates oxygen. Hot air drying is a slow process that is not applicable to uncooked meat or to large pieces of cooked meat (such as roasts, steaks, or chops) because the resultant surface hardening yields a product with poor consumer acceptability. Meat products dried by hot air also shrivel considerably, and have poor rehydration properties due to the protein denaturation that occurs during the drying operation.

17. Ответьте на вопросы к части текста 2.

1. Why does the thawing process do greater damage to meat than freezing?
2. What is an additional serious problem associated with thawing meat products?
3. How many ways of thawing are there in use?
4. Does the time for thawing frozen meat products depend on their size?
5. Which meat products thaw more slowly, lean meat products or fat meat products, why?

18. Переведите письменно часть текста 3 письменно с помощью словаря.

19. Прочитайте текст 3 и обсудите:

- а) назначение упаковки для пищевых продуктов**
- б) имеется ли отличие в упаковке для свежего мяса и продуктов, подверженных посолу?**

Слова для понимания текста С

requirement - требование

damage - вред, повреждение

merchandise - торговать

discolouration - потеря цвета

impermeable - непроницаемый

moisture proof - влагостойкий

film - плёнка (упаковочная)

overwrap - обёртка, верхняя оболочка упаковки

“boil in the bag” - варка продукта в упаковке

seal - закупоривать, запечатывать

pliability - гибкость, пластичность

Text 3. Packaging Requirements and Materials

The principal functions of meat product packages are to provide protection against damage, physical and chemical changes, further microbial contamination, and to attractively display the product to the consumer. Thus, packages are designed to maintain the quality of the product that is placed in it, but they can not improve that quality in any way.

The packaging requirements for fresh and cured meat differ primarily due to the chemical nature of the pigments that are present. One of the most important considerations in meat merchandising is that of maintaining an optimum color. In fresh meat, the optimum color occurs when the packaging materials used allow a sufficient amount of oxygen to pass through them. On the other hand, the packaging materials must be moisture proof in order to prevent product dehydration and surface discoloration. In contrast to fresh meat color, the retention of a stable color in cured meat depends upon the absence of oxygen. Therefore, the packaging requirements for cured meat products necessitate the use of materials that are oxygen impermeable. As in fresh meat, the packaging materials for cured meat products must be moisture proof.

The packaging materials for both fresh and cured meat must protect the product from further microbial contamination during all subsequent storage, handling, and merchandising. Packaging materials must not impart any odor or flavor to the product, and they should retain the natural flavors and odors that are inherent to the product. The packaging requirements for frozen meat include low moisture vapor transmission, pliability, strength, and grease resistance. The overwrap films used in packaging meat for retail display should be strong, have good stretch and heat sealing properties, and retain the seal under normal storage and handling conditions. The packaging materials used for “boil in the bag” meat products must withstand the freezing conditions, freezer storage temperatures, and the rigorous temperature changes encountered during cooking.

A large number of materials are available for the packaging of meat products. These include glass and metal containers, aluminum foil, paper and paper board, cellophane, a large number of films manufactured from polyethylene, polypropylene,

polyesters, nylon, polystyrene, polyvinyl chloride (PVC), saran, and chemically treated rubber (Pliofilm). Combinations of these materials, called laminates, are prepared by bonding together two or more papers, films, or foils to produce a packaging material with a wide variety of functional properties that depend upon the materials used in the laminate.

20. Разделите текст 3 на 3 смысловые части, сформулируйте основную мысль каждой части.

21. Продолжите заполнение следующей таблицы.

Meat product	Principal packaging requirements
Fresh meat	Packaging materials must: a) allow oxygen to pass through them b) be moisture proof

UNITE 5. MILK



1. Прочитайте и переведите следующие тексты.

Text 1. Nutritional value of milk

Man, in common with other mammals, is born a milk drinker, so milk is considered to be highly important for the nutrition and well-being of mammalian infants.

It is interesting that the milks of all species contain the same nutrients, differing only in proportions. Having found milk good food, man domesticated various species of mammals for dairy purposes throughout the world.

Cow milk is sure to be the principal type used in the world. Other animals utilized for their milk production include buffalo (in India, China, Egypt, and the Philippines), goats (in the Mediterranean countries), reindeer (in northern Europe), and sheep (in southern Europe). In general, the processing technology used for cow milk can be successfully applied to milk obtained from other species.

Cow milk has been used by man from the earliest times to provide both fresh and storable nutritious foods. The nutritional value of milk is indicated by the fact that daily consumption of a quart (0,95 litre) of cows milk supplies an average man with approximately all the fat, calcium, phosphorus, and riboflavin, one-half the protein, one third of the vitamin A, ascorbic acid, and thiamine, one-fourth the calories; and with the exception of iron, copper, manganese, and magnesium, all the minerals needed daily.

Considerable amounts of nicotinic acid and choline are also provided.

Nowadays in some countries, almost half the milk produced is consumed as fresh pasteurized whole, low-fat, or skim milk. However, most milk is manufactured into more stable dairy products of worldwide commerce, such as butter, cheese, dried milks, ice cream yogurt, condensed and dried milk.

Text 2

The composition of milk

Hippocrates is generally recognized as the father of medicine and according to one of his early recorded statements, he considered milk to be “the most nearly perfect food”.

Although milk is a liquid and most often considered a drink, it contains between 12 and 13 percent total solids and perhaps should be regarded as a food. In contrast, many “solid” foods, such as tomatoes, carrots, and lettuce, contain as little as 6 percent solids.

Many factors influence the composition of milk, including breed, genetic constitution of the individual cow, age of the cow, stage of lactation, interval between milkings, and certain disease conditions. Since the last milk drawn at each milking is richest in fat, the completeness of milking also influences a sample. In general, the type of feed only slightly affects the composition of milk, but feed of poor quality or insufficient quantity causes both a low yield and a low percentage of total solids. Current feeding programs utilize computer technology to achieve the greatest efficiency from each animal.

The composition of milk varies among mammals, primarily to meet growth rates of the individual species. The proteins contained within the mother's milk are the major components contributing to the growth rate of the young animals. Human milk is relatively low in both proteins and minerals compared with that of cows and goats.

Goat milk has about the same nutrient composition as cow milk, but it differs in several characteristics. Goat milk is completely white in colour because all the betacarotene is converted to vitamin A. Goat milk curd forms into small, light flakes and is more easily digested, much like the curd formed from human milk. It is often prescribed for persons who are allergic to the proteins in cow milk.

Sheep milk is rich in nutrients, having 18 percent total solids (5, 8 percent protein and 6,5 percent fat). Reindeer milk has the highest level of nutrients, with 36, 7 percent total solids (10, 3 percent protein and 22 percent fat). These high-fat, high-protein milks are excellent ingredients for cheese and other manufactured dairy products.

The major components of milk are water, fat, protein, carbohydrate (lactose), and minerals (ash). However, there are numerous other highly important micronutrients such as vitamins, essential amino acids, and trace minerals. Indeed, more than 250 chemical compounds have been identified in milk.

In order to appreciate the nutritional contributions of milk to man it is necessary to consider the value of each major component of milk, beginning with protein and following with lactose, fat, minerals, and vitamins.

Text 3

Nutrients of milk

Protein. Milk contains a number of different types of proteins, depending on what is required for sustaining the young of the particular species. These proteins increase the nutritional value of milk and other dairy products and provide certain characteristics utilized for many of the processing methods. The protein in about a litre of milk is approximately equivalent to that in 140 grams of meat or fish, 5 large eggs, about 100 grams of American or Cheddar cheese, or 16 slices of bread.

It is important that due to its amino acid composition, milk provides man with highquality protein, that is protein containing all of the essential amino acids and in appreciable amounts. With the exception of the amino acids containing sulfur, the estimated average minimal daily requirements of essential amino acids for adult humans can be provided by about half a litre of milk. An average consumer is believed to obtain about 25 percent of his dietary protein, but only 13 percent of his dietary food energy (calories), from milk and milk products. It is desirable that the favorable protein/calorie ratio of dairy products should be 25:13.

There are two main proteins in milk - casein and lactalbumin, traces of other proteins j such as lactoglobulin being also present. Casein comprising about 82 percent of the total amount of milk proteins actually exists as a multisubunit₁ protein complex dispersed throughout the fluid phase of milk. Under certain conditions the casein complexes are disrupted, causing curdling of the milk. Curdling results in the separation of milk proteins into j two distinct phases, a solid phase (the curds) and a liquid phase (the whey).

Lactose (milk sugar). Lactose is the principal carbohydrate to be found in milk, the latter being the only source of lactose in nature. Moreover, it is an amazing fact that the milks of all mammals contain lactose. Human milk is especially rich in this substance and it has been estimated that lactose constitutes 56 percent of the dry matter of a woman's milk, while a cow s and a rabbit s milk contain 36 and 6 percent of lactose respectively.

Lactose was found to be a disaccharide composed of one molecule each of the monosaccharide's (simple sugars) glucose and galactose. In the diet lactose is broken down into these subunits by the enzyme lactase. The monosaccharide's can then be absorbed from the digestive tract for use by the body. However, individuals deficient in lactase cannot metabolize lactose, a condition called lactose intolerance.

Galactose is known to be the main constituent of the central nervous system and brain tissue, so milk lactose is likely to be brain food, as well as a special nutrient for growth and development of the central nervous system of mammalian young.

Scientists have found out human milk to contain 7,0 percent of lactose and to coincide with the large brain size as related to total body mass of man. It has been reported that students who are breast-fed² as infants make significantly higher scores at examinations than their bottle-fed³ contemporaries.

Another favourable feature of lactose is its hygienic value⁴. Thus, being an important food source for several types of fermenting bacteria, lactose stimulates growth of microorganisms producing organic acids and synthesizing many B-complex vitamins. The process of converting the lactose into lactic acid in the presence of certain bacteria is the basis for obtaining several types of dairy products.

It is now known that the presence of lactose enhances the absorption of calcium, phosphorus, magnesium, and barium from the intestine. This unique quality of lactose also makes milk an excellent antirachitic food even when milk is low in vitamin D.

As lactose enables microorganisms of the intestine to synthesize niacin (nicotinic acid), another desirable nutritionally related quality of lactose is its involvement in the antipeilagric⁵ properties of milk. To obtain the required daily 18 milligrams of niacin from milk, an average man would need to consume about 17 litres of milk a day.

Milk Fat. The historical aspects of the nutritional importance of milk fat are generally known. The fat in milk is secreted by specialized cells in the mammary

glands of mammals. It is released as tiny fat globules or droplets⁶, which are stabilized by phospholipids and proteins presented in milk.

Milk fat is composed mainly of triglycerides - three fatty acid chains attached to a single molecule of glycerol. It has been found that milk fat contains 65 percent saturated, 32 percent monounsaturated, and 3 percent polyunsaturated fatty acids. Certain fatty acids (unsaturated) are essential fatty acids, dietary elements whose deficiency produces certain effects similar to deficiency. These essential fatty acids include linoleic (two double bonds), linolenic (three double bonds), and arachidonic (four double bonds) ones. About half a litre of whole milk contains about 7, 2 grams of unsaturated fatty acids and about 10, 5 grams of saturated fatty acids.

The fat droplets carry most of vitamin A and the cholesterol, the role of the former, abundant in milk fat, in good eyesight is now well established.

Fat aids in calcium absorption, and since milk contains abundant calcium, the complementary effect of fat in whole and low-fat milks is especially important to the nutrition «ad health of man.

Vitamins. Milk contains all of the known vitamins. Most fluid milks are enriched with vitamins A and D 13 so that milk and milk products provide man with a rich and well-balanced supply of the fat-soluble vitamins (A, D, E, and K) and of the water-soluble vitamins (except ascorbic acid, or vitamin C).

However, its vitamin C (ascorbic acid) content is easily destroyed by heating during pasterization. Vitamin D is formed naturally in milk fat by ultraviolet irradiation but not in sufficient quantities to meet human nutritional needs. Beverage milk is commonly fortified with the fat-soluble vitamins A and D. In the USA the fortification of skim milk and low-fat milk with vitamin A is required by law.

Milk also provides many of the B vitamins. It is riboflavin that milk especially rich in, while it provides lesser amounts of thiamine (B1) and niacin. Other B vitamins found in trace amounts are pantothenic acid, folic acid, biotin, pyridoxine (B6), and vitamin B12.

It is important that consumers obtain about one-half of their riboflavin from dairy products and certain other B vitamins.

It is required that senior citizens should increase their consumption of milk products to compensate their needs in certain vitamins, which play important role in many life processes.

Minerals. Milk is noted for its abundant supply of minerals. Moreover, they occur in milk in the right proportions or ratios for optimal absorption into blood from the digestive tract. Milk is the best nutritional source of calcium, not only because of its richness in calcium, but also because of the favorable calcium/phosphorus (Ca/P) ratio (about 1.4:1). It also contains trace amounts of potassium, chloride, sodium, magnesium, sulfur, copper, iodine, and so on.

Approximately 99 percent of the calcium and 90 percent of the phosphorus in the body is in the skeleton. The dramatic supplementary value of milk minerals for growth of children was noted by the study involving 20000 schoolchildren (5 to 12 years of age) in Scotland, one group received about 0,35 litre of milk daily in addition to food consumed at home. The researchers concluded that “the influence of the addition of milk to the diet of schoolchildren is reflected in a definite increase in the rate of growth both in height and weight”. This growth- accelerating effect of milk results largely from the richness and availability of milk calcium and phosphorus. Skim milk (nonfat milk) has been reported to increase growth in height as much as does whole milk.

Recent experiments using radioisotopes indicate that about one-sixth of the skeletal calcium is turned over annually, and if the diet is low in calcium, it is taken away from the bones. Thus, this mineral is of great importance to the health of senior citizens, though the need for a consistent and reliable source of dietary calcium exists throughout one's life.

Unfortunately, milk consumption among those 25 years and older is said to be too low to ensure adequate dietary calcium.

Milk is deficient in iron and copper. A lack of adequate amount of these minerals is said to keep milk from being a complete food. However, this is not an accident of nature because the presence in milk of these minerals (in much larger

amounts than normally exist) would be destructive to certain vitamins and would catalyze oxidation thereby producing a metallic or oxidized flavor.

1. multisbunit - зд. сложная субъединица
2. breast-fed - вскармливаемый грудью
3. bottle-fed - искусственно вскормленный
4. hygienic value - зд. профилактическое значение для здоровья
5. antipeilagric - противопеллагрический
6. droplet - капелька
7. turn over - зд. выводиться

2. Ответьте на следующие вопросы:

1. What kinds of animals were domesticated for dairy purposes?
2. Why is it important for man to consume cow milk daily?
3. What factors influence milk composition?
4. How does milk composition vary with mammals?
5. Is milk as rich in proteins as meat?
6. What are the main two proteins in milk and why are they important?
7. What is known about the structure of lactose, the principal carbohydrate in milk?
8. Why is lactose so highly valued?
9. What is milk fat composed of?
10. What important vitamins are provided by milk products?
11. What minerals is milk rich in?
12. What does "the growth-accelerating" effect of milk result from?
13. Why is it necessary to increase the consumption of milk for older people?
14. What vitamins is milk fortified with to meet human nutritional needs?
15. How is the fat formed in milk?

Part II. Concentrated and frozen milk products

3. Прочитайте, переведите и подготовьте аннотации текстов.

Text 4. The importance and characteristics of concentrated and milk products

Milk is known to be widely used not only in the fresh fluid form, but in some concentrated and preserved forms. It is important that concentrated and dried milk products occupy less space, weigh less, and remain edible longer than fresh milk. Thus, they save storage and packaging space, cost less to transport, and serve as a reserve in times of short supply. Moreover, these products have certain properties that make them especially useful as in the use of nonfat dry milk in dry cake mixes. Concentrated sources of milk solids are required in cookery for preparing numerous foods, which would be diluted by a less concentrated form of milk.

The production of these products seems to be a simple operation as it mainly involves the removal of water. However the complex nature of raw materials used needs special study by dairy scientists.

Concentrated milk. This term refers to those products from which sufficient water is removed to concentrate the milk fat to at least 7,5 percent and total milk solids to at least 25,5 percent. |

Whole, low-fat and skim milks, as well as whey and other dairy liquids, can be efficiently concentrated using heat under vacuum. Since reducing atmospheric pressure lowers the temperature at which liquids boil, the water in milk is evaporated without affecting a cooked flavor. There exist modern expensive technologies such as ultrafiltration.

Concentrated milk is pasteurized but not sterilized by heat to prevent spoilage, and then preserved by refrigeration. The obtained product is sure to require less storage space, so it costs less to distribute.

Most concentrated milk is known to be supplied to industry and processed into plain condensed milk, which is used as an ingredient in manufacturing other products.

Condensed milk. This term is usually applied to the product obtained by partially removing water from a mixture of milk and suitable nutritive sweetener. The final product contains about 8,5 percent milk fat and at least 28 percent total milk solids. Being added in Sufficient amounts (at least 60 % in the water phase), sugar provides high osmotic pressure and prevents bacterial action and product spoilage, thus facilitating the storage of the product at room temperature. It is interesting that sweetened condensed milk was first produced on a commercial scale in about 1858 in New York, and today it is often sold in refrigerated tank - truck loads₁ to manufacturers of candy, bakery goods, ice cream, cheese, and other foods.

Evaporated milk. The name is reserved for the product made from homogenized milk by concentrating with heat and vacuum to obtain at least 25,5 percent total milk solids and 7,5 percent milk fat, and by further sterilizing of the product in the sealed can at 118°C. It is essential to fortify the product with vitamins A and D, A stabilizer, such as disodium phosphate, is also added to keep the product from separating during processing and storage. To obtain high-quality evaporated milk, new ultrahigh-temperature processing as well as aseptic filling of metal cans are widely practiced. These measures prevent evaporated milk from caramelized flavor and allow to store it for several months at room temperature.

Dry milk products. Dry milk products are generally less perishable than concentrated milks, as they contain less amount of milk fat and more stable to oxidation.

In contrast to concentrated milks, which are stored only for 10-15 days, the storage time of dry milk products lasts for several months.

Milk and by-products of milk production are often dried to reduce weight, to aid in shipping, to extend shelf life, and to provide a more useful form as an ingredient for other foods. In addition to skim and whole milk, a variety of useful dairy products are dried including buttermilk, instant breakfast, sweet cream, sour cream, ice cream mix, cheese whey, coffee cream, dehydrated cheese products, lactose, etc. Many drying plants are built in conjunction with a butter-churning plant, the former utilize the skim milk generated from the separated cream and the buttermilk produced from

churning the butter. Most products are dried to less than 4 percent moisture to prevent bacterial growth and spoilage.

However, products containing fat lose their freshness rather quickly owing to the oxidation of fatty acids, leading to rancidity.

Two types of dryers are used in the production of dried milk products - drum dryers and spray dryers⁴, each dryer having certain advantages.

1. in refrigerated tank-truck loads - зд. отгрузка в молочной автоцистерне с охлаждением
2. sealed can - герметичная консервная банка
3. drum dryer - барабанная сушилка
4. spray dryer-распылительная сушилка

Text 5

The origin of frozen milk desserts

Refreshing appetizing, convenient, adaptable, nutritious-who can dentinal these qualities of ice cream, ice milk, and sherbets place them at the top of the preferred list of frozen desserts from milk that can readily fulfill one's desires and satisfy the budget?

Primarily frozen milk products were available only to the rich frozen expensive refrigeration, but today these products are considered to be foods in the true sense. Being easily digested, milk desserts are preferred both by children and adults because of their conveniences and variety.

Ice cream is said to have appeared from flavoured ices that were popular with the rich Roman in the 4 century BC In the 1 century AD, when the emperor Nero ruled, a substance resembling ice cream was prepared from snow brought from the mountains and mixed with honey, juices, and fruit. It was recorded that in the 13 century Marco Polo returned from China with a recipe for making water and milk ices.

The first 84-page manuscript "The Art of Preparing Ice Cream" was written by the unknown author about 1700. A more detailed description of "food for the gods"

and explanations for phenomena such as freezing water were given in a book "The Art of Making Frozen Desserts" that appeared in Paris in 1768.

In America, Governor William Bladen of Maryland served a dessert containing ice cream and strawberries in about 1700, and George Washington spent approximately 200 dollars for ice cream in New York during the summer of 1790. The discovery that salt would lower the freezing point of cracked ice led to the first practical method of making ice cream. But consumption by the masses had to wait for development of ice freezing equipment until the 19th century.

It was only with the development of mechanical refrigeration that widespread distribution of ice cream became possible. The first wholesale ice cream business in the United States was started in Baltimore by Jacob Fussell in 1851.

Introduction of the ice cream at the 1904 World Fair in St. Louis stimulated the demand for it. In the USA consumption increased dramatically from 1920 to 1940, peaked at more than 19 litres per person in the postwar year of 1946, then decreased to about 14 litres as ice milk became an important frozen dessert. Production of ice milk in the US increased 75 percent in the 1960s, and more than half of it is sold in the soft-frozen form (products were sold directly to consumers from milk shake machines). Total production of frozen desserts containing milk approximated more than 3000 million litres in the 20 centuries, about 150 million litres of water ices having been produced as well. Dietetic and diabetic frozen desserts accounted for 1.2 percent of the total sales.

Although more frozen desserts are consumed during summer than any other season, a trend toward more uniform monthly consumption continues. This is further evidence that consumers view ice cream as food rather than confection.

The following characteristics are desirable for frozen desserts: fine flavour, smooth texture, moderately resistant body, optimal overrun (amount of air-whipped in), resistance to heat shock, attractive appearance, ability to be dipped, homogeneous appearance on meltdown, proper freezing (melting) point, nutrition, economy, and ability to refresh.

1. milk shake machine - зд. аппарат для взбивания молочного коктейля

2. confection - зд. сласти, кондитерские изделия
3. optimal overrun - оптимальное содержание воздуха, которое включается при взбивании
4. resistance to heat shock - устойчивость к тепловому воздействию
5. ability to be dipped - способность быть обработанным снаружи, например шоколадом
6. to refresh - освежающая способность

Text 6

Types and composition of frozen desserts

By varying quantities of main ingredients, numerous types of frozen dairy desserts can be produced. Standards for ice cream and most frozen desserts are closely regulated.

In the US, for example, ice cream must contain at least 10 percent fat and 20 percent total milk solids¹ (usual requirements are 20 and 18 percent for plain and bulky ice creams, respectively). In freezing, the volume may be doubled by the inclusion of air (known as overrun), but the increase in volume is limited to 100 percent by the requirement that the finished product weigh at least 2 kg per 4 litres. Total food solids must weigh about 700 grams per 4 litres, thus limiting the water content. Regulations also require all ingredients to be listed, with some additives (such as stabilizers) limited to very small amounts. The principal frozen desserts are ice cream, frozen custard, ice milk, frozen yogurt, sherbet, and water ices.

Ice cream and ice milk. Major components of ice cream are known to be milk fat, nonfat milk solids, sugar, stabilizer, and flavoring. There exist a wide range for producers to vary content of both milk fat and nonfat milk solids, the quantity of one component being "increased, the quantity of the other being decreased. Ice cream has the highest fat content, ranging from 10 to 20 percent.

Frozen custard, or French ice cream, is basically the same formula as ice cream except that in finished form it must contain at least 1,4 percent egg yolk² solids.

Plain ice creams contain coloring and flavoring ingredients (such as vanilla, coffee and maple syrup³) no more than 5 percent of their unfrozen volume. Bulky flavored ice creams may contain lower concentrations of milk fat and total milk solids than plain ice cream to the extent that flavoring and additional sweeteners displace these components (up to 2 percent less milk fat and 4 percent less total milk solids).

Ice milk may be more commonly called “light” or “reduced-fat” ice cream. It contains between 2 and 7 percent milk fat and at least 11 percent total milk solids. Bulky flavors of ice milk, unlike ice cream, must contain as much total milk solids as plain flavors. Public desire to consume less fat and improvements in production process have brought great popularity to ice milk.

About 3,5 to 4,5 grams of protein are consumed in each 130 grams of ice cream or ice milk. This approximates 10 percent of the recommended daily high-quality protein. These quantities of ice cream and ice milk would contain approximately 250 and 140 calories, respectively. About 15 percent of the required amount of calcium would be supplied by either.

Sherbets. They are characterized by a sweet but tart flavour and a low content of total milk solids (usually 3 to 5 percent). Most standards require between 1 and 2 percent milk fat and between 2 and 5 percent total milk solids. Sherbet contains considerably more sugar and less air than ice cream (the target overrun is 30 to 40 percent), and therefore it is heavier and often contains more calories per serving. Minimum acid content is 0,35 percent calculated as lactic acid. Citric acid is more often added, but tartaric, malic, ascorbic, lactic, and phosphoric acids are permissible. They can be made by mixing ice cream mix with water ice mix, or they can be compounded directly from raw ingredients.

Due to the high sugar content, the melting point of sherbets is low, so they are softer than ice cream at the same temperature. Nearly all sherbets are sold in the hard- rather than the soft-frozen form.

Ices. Being similar to sherbet, but containing no milk solids, water ices are usually composed of sugar (30 percent), fruit juice (20 percent), flavouring, colour,

stabilizer (0,2 ; 0,6 percent), citric acid, and water. Overrun in ices should be approximately 30 percent.

Ices may be frozen in the same manner as ice cream, but they are often dispensed as liquids into forms in which they are frozen on sticks to make Popsicles.

The Popsicle was invented by Frank Epperson 1923 accidentally. On a cold winter evening Epperson is said to have left on a windowsill a glass of lemonade containing a spoon. By morning the lemonade had frozen, so he put the glass in water and removed the frozen mass. The invention was patented in 1924.

Mellorine. Imitation ice cream, known as meliorate, is made in some parts of the USA and other countries. It is composed essentially of the same ingredients as ice cream except that the milk fat is replaced with less expensive vegetable fat and the minimal fat content is 6 percent. Therefore, the product has more fat than most ice milk but usually contains less than does ice cream. Containing not less than 2,7 percent protein by weight, mellorine is intended to compete with ice cream in places where butterfat prices are high.

1. total milk solids - общее содержание сухого вещества молока
2. egg yolk - яичный желток
3. maple syrup - кленовый сироп
4. reduced-fat - обезжиренный
5. popsicle - амер. фруктовое мороженое на палочке
6. mellorine - меллорин (заменитель мороженого)

Text 7

Ice cream manufacture

The essential ingredients in ice cream are milk, cream, sugar, flavoring, and stabilizer, cheaper ingredients such as dry whey, corn syrup, and artificial flavorings having been introduced to create a lower-cost product.

The first step in ice cream making is formulating a suitable mix, the latter being composed of a combination of dairy ingredients, such as fresh milk and cream, frozen cream, condensed or dried skim, buttermilk, dairy whey, or whey protein concentrate.

Sugars may include sucrose, corn syrup, honey, and other syrups. Stabilizers and emulsifiers are added in small amounts to help prevent formation of ice crystals, particularly during temperature fluctuations in storage.

The ice cream mix is pasteurized at no less than 79°C for 25 seconds. The heated mix is typically homogenized in order to assure a smoother body and texture.

After homogenization, the hot mix is quickly cooled to 4,4°C. The mix must age at this temperature for at least four hours to allow the fat to solidify and fat globules to clump¹. This ageing process results in quicker freezing and a smoother product.

The next step, freezing the mix, is accomplished by one of two methods: either continuous freezing², which uses a steady flow of mix, or batch freezing³, which makes a single quantity at a time. For both methods, the objective is to freeze the product partially and, at the same time, incorporate air.

Semi frozen ice cream leaving the freezer at a temperature between -9° and -5°C is placed in a suitable container and conveyed to a blast freezer⁴, where temperatures are in the range of -29° to -34°C. Rapid freezing at this stage prevents the formation of large ice crystals and favors a smooth body and texture. The length of time in the hardening rooms depends on the size of the package, but usually 6 to 12 hours are required to bring the internal ice cream Temperature to -18°C or below, in larger manufacturing plants, final freezing takes place in a hardening tunnel, where packages are automatically conveyed on a continuous belt to the final storage area.

Much of the appeal of ice cream comes from the variety of standard mixes and flavors available throughout the year. Most ice cream manufacturers make a standard mix consisting of milk, cream, sugars, and stabilizers, to which flavors may be added just prior to freezing. There exist various types of flavors, such as high-volume flavors (vanilla, chocolate, strawberry), with large particles (fruit, nuts, cookies, or candy parts), so they are added at different stages of the process.

Being kept below -23° C and protected from temperature fluctuations, ice cream and other frozen desserts require no preservatives and have long shelf lives. Airtight packaging materials have made it possible to store frozen products for six months or longer without loss of flavor or body and texture.

Manufacturers have several alternative sources of ingredients for frozen desserts and their choices depend upon availability, costs, functional properties, and the quality of product they wish to produce. Quality assurance of frozen desserts includes examination of ingredients, mix, and finished products, tests being recommended for microbial counts, composition of fat and total solids, overrun, flavor, body, texture, color, and meltdown.

When standards of high quality are met, frozen desserts become an excellent means of providing milk for man.

1. to clump - собираться в группу
2. continuous freezing - непрерывное замораживание
3. batch freezing - порционное замораживание
4. blast freezer - морозильная камера, в которой замораживание происходит в интенсивном потоке воздуха
5. hardening room - помещение, где происходит затвердевание и повышение устойчивости продукта
6. airtight - воздухонепроницаемый

4. Ответьте на следующие вопросы:

1. What are concentrated and dried milk products manufactured for?
2. How does condensed milk differ from evaporated milk in the percentage of total milk solids and milk fat?
3. Which type of milk product (condensed/ evaporated/ dried) can be stored longer?
4. What kinds of dairy products can be dried?
5. What is known about the origin of frozen milk desserts?
6. Why wasn't ice cream available to most people until the 19th century?
7. What are the most desirable characteristics of frozen dessert?
8. What are the requirements to the composition of frozen dairy desserts?
9. What does the term "overrun" mean?
10. What is the difference between plain and bulky ice creams?

11. Why have ice milks become popular with consumers?
12. What are the characteristics of sherbets?
13. What are ices composed of?
14. What imitation of ice cream is produced?
15. What are the steps of ice cream manufacture process?
16. How can the shelf life of ice creams be extended?
17. What are the main two methods of freezing the ice cream mix?
18. What operations in ice cream manufacturing allow producers to obtain smooth body of the product?
19. Is the demand for ice cream constant throughout the year?

UNIT 6. MY FIELD IS MEAT PRODUCTION

1. *Прочтите и переведите на русский язык текст «My Field is Meat Production».*

Text 1. My Field is Meat Production

I am a full-time student of the Kemerovo technological institute of food industry. After graduating I'll be a technologist-engineer of meat production. I am sure this profession is one of the most important and necessary ones. I hope I'll have a wide choice of careers since meat production is a large and consistent area of employment. Meat products are always in high demand, and, moreover, meat consumption is often an indicator of the economic status of a country or individual.

I know that modern meat packing plants are producing a wide range of meat foods. They are smoked meats (ham, bacon, brisket, etc.), canned meats (fried meat, boiled beef, sausage meat, etc.), prefabricated meats (beefsteak, shashlik, minced meat, hamburgers etc.) and, of course, sausage, one of the most popular forms of meat food.

I'd like to remind that meat is one of the most nutritious foods used for human consumption. Meat is an excellent source of high-quality protein. It, also, contains large amounts of minerals and essential B complex vitamins. Everyone knows that adequate protein nutrition is essential because it provides a human body with sufficient quantity of high-quality protein.

Modern meat processing plants are very different from the old ones. They are usually attractive in appearance. On the inside they are bright, well lighted, and easy to clean. Besides the comfort and the safety of the employees is considered. The plants of modern meat industry are often very specialized. Some of them manufacture a limited line of processed meat items. Other plants can produce only manufactured meat products, receiving cuts, carcasses or boneless meat from outside sources.

It's known that once the manufacture of meat products was an art handed down from generation to generation. Today, the development of new products and the improvement of old ones is a science. Many major meat packing companies have extensive research facilities and employ highly trained food experts to solve problems and develop new products.

Meat science is a broad field of study. An important part of it is the basic study of the unique characteristics of muscle and the other animal tissues that are used as meat. A complete understanding of the basic properties of the tissues used in meat can lead to improved utilization and better meat products.

But I must note that meat science is not limited to the study of tissues. It includes all aspects of the meat industry, beginning with animal production and ending with final preparation for consumption. Breeding, feeding and management are extremely important parts of the food chain. The market system has a profound influence on the meat industry as well. The meat packers, processors and purveyors make up that segment of the industry which converts the live animals into food products and then distributes them to retail stores, hotels, restaurants and institutions. It is in this segment that many of the aspects of meat technology are applied, both to maintain product quality and to develop new and different meat products.

It should be noted that students who plan to be associated with any part of the livestock and meat industry during their working careers must not be satisfied with learning only the status of the industry today, for this knowledge will soon be out of date. Instead, they must learn basic concepts and be prepared to apply them to changing situations. In addition, they should prepare to be the initiators of changes.

I should say, in conclusion, that I like my future profession very much because it

is interesting and important for the life of our people and the country as a whole. I'll do my best to become a highly qualified specialist and try to change things in meat industry for the better.

2. Вставьте предлоги в предложениях в соответствии с текстом «My Field is Meat Production».

1. Meat provides a human body ... high quality proteins.
2. Modern plants are very different ... the old ones.
3. Meat is one of the most nutritious foods used ... human consumption.
4. A complete understanding of meat technology can lead ... better meat products.
5. The market system has a great influence ... the meat industry.
6. The meat packers, processors and purveyors make ... a very important segment of the industry.
7. Students must be prepared to apply the knowledge ... changing situations in meat industry.

3. Найдите в прочитанном тексте эквиваленты следующих русских словосочетаний.

Широкий выбор профессий, мясоперерабатывающий завод; инженер-технолог; мясные полуфабрикаты; потребление мяса; комфорт и безопасность; привлекательный внешний вид; высокий спрос; ограниченный ассортимент; мясо, подверженное технологической обработке; специалисты по пищевым продуктам; мясо без костей; мышечная ткань. разрабатывать новые продукты.

4. Составьте из слов предложения и переведите их на русский язык.

1. a, wide, producing, meat, of, foods, are, plants, packing, modern, range, meat.
2. the, student, a, I, full-time, of, am, institute.
3. is, ones, necessary, my, most, profession, the, important, one, and, of.

4. often, an, consumption, is, of, status, indicator, economic, meat, the, country, a, of.
5. manufactured, produce, some, plants, can, only, products.
6. today, is, a, development, new, of, products, the, science.
7. important, breeding, are, food, parts, chain, extremely, feeding, of, food, management, and.

5. Ответьте на вопросы по теме «Моя специальность», используя материал текста и упражнений.

1. What is your field?
2. Why did you choose this profession?
3. Can you have a wide choice of careers after graduating from the institute? Why?
4. Do you know what meat products are produced at modern meat packing plants?
5. Why are meat foods always in high demand?
6. What was the manufacture of meat products in the earlier times?
7. What changes have taken place in the meat industry?
8. Science is widely applied in the meat industry, isn't it?
9. What aspects does meat science include?
10. What must students learn in order to be satisfied with their working careers in the meat industry?
11. What are many aspects of meat technology applied for?
12. To become a highly qualified specialist you should be prepared to changing situations. Do you agree with this statement?

6. Переведите следующие предложения на английский язык, начиная с речевых штампов.

1. Я убеждён, что ...
 - а) одной из самых важных и интересных профессий в современном мире является профессия инженера-технолога;

б) мясные продукты всегда будут пользоваться высоким спросом.

2. Необходимо заметить, что ...

а) современные мясокомбинаты очень отличаются от прежних мясоперерабатывающих заводов;

б) они, как правило, имеют привлекательный внешний вид.

3. Известно, что ...

а) разработка новых продуктов - это наука;

б) мясоперерабатывающие предприятия стараются брать на работу высококвалифицированных специалистов пищевых производств.

4. Следует подчеркнуть, что ...

а) учёные изучают уникальные характеристики животных тканей;

б) помимо этого, они занимаются такими аспектами мясной промышленности, как разведение пород животных, создание кормов и другие.

5. В заключение я бы хотел отметить, что ...

а) для разработки новых мясных изделий мясная промышленность использует новейшие технологии;

б) специалисты пытаются улучшить положение дел в мясной промышленности.

7. Прочитайте диалоги 1 и 2 по ролям и переведите на русский язык.

Dialogue 1

A Specialty in Demand

Alex: Hi, Victor!

Victor: Hi, Alex! How are you?

A.: I'm fine, thanks. Now I'm a student.

V.: What institute have you entered?

A.: The Kemerovo technological institute of food industry. I study at the technological faculty.

V.: Oh, that's nice. What is your field?

A.: Meat production. I'll be a technologist engineer.

V.: And what about employment after graduation? Where would you like to find a job?

A.: I don't know yet. I have much time ahead of me to think of it.

V.: To my mind, there is a big choice of careers nowadays, isn't there?

A.: Yes, sure. I'll be able to work as a technologist engineer at any meat packing plant or I'll start my own business.

V.: You're quite right. As far as I know there is always a high demand for meat products.

A.: That's true. Besides, I've always wished to deal with food for human consumption. I think this profession is my calling.

V.: Well, good luck. I hope you'll be a perfect specialist.

Dialogue 2

The Importance of Meat Products

- Hello, Alice, haven't seen you for ages!

- Nice to see you, Mary. What has happened to you? You look so tired.

- I'm not tired. Don't worry. The fact is I'm going on diet now.

- Poor thing! What diet is it?

- I don't eat meat and meat products.

- You don't say so. According to nutritionists, life without meat is dangerous. Don't you know that?

- But there is a different point of view. Alice, have you heard anything about vegetarians? By the way, vegetarian tradition has a long history. The vegetarians have very good health and can work much more than meat eaters.

- What a miserable lot dieters are! They are forever consulting caloric charts.

- I don't agree. It's a common knowledge that vegetarians live longer.

- And what of it? Mary, don't forget, meat is one of the most nutritious foods. It is an excellent source of high-quality protein. It contains large amounts of minerals and essential B complex vitamins.

- Perhaps, you are right saying this. But we can get the same nutrients eating such foods as cereals, vegetables, fruits, and fish.

And another important reason is that having vegetarian diet we can avoid killing animals.

- Anyway, I'm convinced that the diet must be balanced. Let people eat both animal and vegetable food. The thing is that one should not overeat. It is overweight that is bad for health but not meat as it is.

- Let's stop arguing, Alice. Tastes differ after all.

8. Составьте диалоги аналогичные диалогам 1 и 2, используя следующие выражения.

1. It's a very fine profession, isn't it?
2. Do you like the profession of technologist-engineer?
3. Food technology is your calling, isn't it?
4. There are many careers open to you.
5. What do you plan to do after graduating from the institute?
6. I'd like to work at a large modern meat packing plant.
7. No doubt, you'll make a good specialist.

9. Прочитайте и переведите на русский язык диалоги 3 и 4.

Dialogue 3

Finding a Job (Interview)

Correspondent: It's known that the unemployment rate is rising. What do you think of the chances of finding jobs for school-leavers today?

Staff manager: They are very little because in most cases employers want workers to have had any special training.

Corr.: And what about the prospects for university or institute graduates?

St. man.: I think they are not very good as well. As a rule one may be sure of a job if he has a few years of practical experience behind him.

Corr.: How do people usually get information about possible jobs?

St. man.: It's common knowledge that some people try to get jobs through their parents, relatives or friends because they may have good contacts. Also, you may look through ads (advertisements) in newspapers or magazines.

Corr.: Thank you for interview.

Dialogue 4

At a Meat Packing Plant

A. I was told you want people at your plant? Is it true?

B. Yes, we are willing to employ some skilled workers.

A. Have you got any vacancies in a dressing shop? (цех разделки туш).

B. Yes, there are some. Sit down, please. What do you do at present? Do you work or study anywhere?

A. I am a student of the Kemerovo technological institute of food industry. After leaving a secondary school I worked for a short period of time and then entered the institute. I am on my last summer holidays now. Next year I'll defend my undergraduate project.

B. Have you got any skills in dressing carcasses?

A. Yes, I have. But they are not very high. I've had a little experience through my vocational practice I had a year ago. Besides, I worked as a slaughterer (забойщик скота) before entering the institute.

B. And what is your future profession?

A. I'll be a technologist engineer of meat production.

B. I think, it's a fine profession. Do you agree?

A. Oh, yes. I'm sure it's very interesting and difficult at the same time. But I'll do my best to become a highly qualified specialist.

10. Ответьте на вопросы:

1. What do you think of your chances to find a job when you graduate from the institute?

2. Are you afraid of unemployment?

3. Where will you be able to get information about possible jobs?
4. Why have you chosen just that very (именно эту) profession?
5. Where would you like to find employment after graduation?

11. *Просмотрите нижеследующую информацию. Что вы думаете по поводу сказанного?*

It is important that people enjoy their work as much as possible and enjoying work means having made the right choice of the profession. Unfortunately, many older people look back on their lives, and regret (сожалеть) that they did not obtain some good vocational guidance (профориентация) when they were about 16 years of age.

How, do you think, teenagers (подростки) should be helped in their choice of career?

Did you choose your profession by yourself?

12. *Прочтите и переведите текст «Job Satisfaction».*

Job Satisfaction

Studs Terkel asked 135 people, from elevator operators to company presidents, “How do you like your job?” while he was writing his book “Working”. Most of those people answered: “I don’t”.

Why do people dislike their jobs? The answer is often obvious. In today’s world of mass production and division of labour, few people are doing a job that is unique. Most workers perform tasks just like thousands or millions of other workers. As a result, few workers feel truly necessary or important. They seldom get the feeling of satisfaction.

The job satisfaction is also related to productivity. Some experts believe that workers’ productivity level has fallen throughout the world. On the other hand, it is known that workers today have better pay and benefits, safer working conditions and more job security. Dissatisfied workers do not perform as well as those who are satisfied.

The organization of business today seldom allows workers the opportunity of performing creative tasks.

13. Ответьте на вопросы к тексту «Job Satisfaction».

1. What question did S. Terkel ask people?
2. Were those people occupied in the same field?
3. Most of them answered “Yes”, didn’t they?
4. How did S. Terkel explain their negative answer?
5. What does job satisfaction affect in the author’s opinion?
6. What do you think about job satisfaction? Is it important for a worker? Is

it possible to get the feeling of satisfaction in the today’s world of mass production?

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