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“Dairy manufacture”

Учебное пособие
по дисциплине Иностранный язык

Специальность 19.02.01 Технология молока и молочных продуктов

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Данное учебное пособие предназначено для студентов среднего профессионального образования, изучающих Иностранный язык, с целью обеспечения их материалом для практических занятий, закрепления теоретического материала, их индивидуальной работы, а также в целях самостоятельного овладения знаниями и умениями при изучении иностранного языка.

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Contents

Introduction
(Введение)

В процессе подготовки кадров по специальности 19.02.01 Технология молока и молочных продуктов важная роль отводится глубокому изучению иностранных языков и, прежде всего английскому языку.

В настоящее время преподавателям дисциплины Иностранный язык трудно найти необходимую литературы, связанную со спецификой производства молочных продуктов. Им часто приходиться сталкиваться со скучными, устаревшими, а иногда и просто придуманными для иллюстрации того или иного грамматического явления текстами.

Происходящие в окружении изменения должны находить свое отражение в совершенствовании учебного процесса по курсу изучения иностранных языков средних специальных учебных заведениях России. При издании пособия оказалось необходимым учитывать контингент студентов, которым адресуется пособие, изменение целей и задач обучения иностранному языку, а также отсутствие языкового окружения, в условиях которого студенты работают с пособием.

Учебное пособие по иностранному языку “Dairy Manufacture” предназначено для студентов учебных заведений, обучающихся по специальности 19.02.01 Технология молока и молочных продуктов.

Цель настоящего пособия оказать помощь:1. преподавателям:
- в организации занятий по иностранному языку;

2. студентам:
- в приобретении навыков в чтении и обсуждении текстов;
- в накоплении необходимого лексического словарного минимума;
- в закреплении и усвоении наиболее сложных грамматических конструкций.

Пособие состоит из четырех частей:
- «Характеристики молока».
- «Концентрированные и замороженные молочные продукты».
- «Кисломолочные продукты».
- «Масло и сыр».

Каждая тема заканчивается разделом “Revision”, в который включены вопросы для обсуждения пройденных тем и упражнения для повторения некоторых грамматических конструкций на основе этой лексики. После текстов приводятся разъяснения отдельных терминов и их перевод.

При весьма большом лексическом материале наиболее часто употребляемые термины, связанные с указанной специализацией, внесены в терминологический словарь, прилагаемый в конце пособия.

Учебное пособие может представлять интерес, как для начинающего, так и для опытного преподавателя.

Учебные материалы пособия изложены столь доходчиво и ясно, а их усвоение требует от обучаемых столь небольших умственных усилий, что работа с пособием может быть рекомендована даже самым ленивым студентам.

Part I. Milk characteristics

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 beta-carotene 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 high-quality 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 multisubunit[1] 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-fed[2] as infants make significantly higher scores at examinations than their bottle-fed[3] contemporaries.

Another favourable feature of lactose is its hygienic value[4]. Thus, being an important food source for several types of fermenting bacteria, lactose stimulates growth or 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 antipeilagric[5] 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 droplets[6], 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 lowfat 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 mounts 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 m the right proportions or ratios for optimal absorption into blood from the digestive ract. Milk is the best nutritional source of calcium, not only because of its richness in calcium, but also because of the favourable 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 j 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 j 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[7] 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 ones 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 flavour.

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

Revision I

Answer the questions:

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 principle 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?

Grammar issues to be revised:

I. Forms of participle.
II. Participial constructions.
III. Substitute-words one(s), that, those.
IV. Passive forms.

I. Translate the following paying attention to participles.

Milk secreted; all of the vitamins known; the problems of vitamin deficiency outlined; some of the nutrients contained; the minerals required; proper bone growth ensured.

Domesticated animals; processed milk; stored food; indicated nutritional value;

recognized scientists; recorded statement.

Proteins contained in milk; nutrients required by man; composition of milk affected by feeds; low percentage of total solids caused by poor feed quality; milk substitutes used in feeding babies.

Increasing consumption; declining nutritional value; slowing growth; growing vitamin deficiency; accelerating bone growth.

Factors influencing milk consumption; feeds affecting composition of milk; high lactose content corresponding to the large brain size; lactose constituting 36 percent of dry matter diseases causing reduced lactation; goat milk curds forming easily digested flakes.

II. Choose the correct participle.

1. People obtain dairy products from different (domesticating/ domesticated) species of mammals (living/ lived) in their region.
2. (Applied/ Applying) the same technological principles one can successfully process milk (obtained/ obtaining) from cows, goats, sheep and other animals.
3. It is interesting that (consumed/ consuming) one litre of cow's milk an average man can satisfy his need in all essential nutrients.
4. (Pasteurizing/ Pasteurized) cow milk as well as sheep or goat milk is (processing/ processed) into cheese.
5. Proteins (contained/ containing) in mammals' milk are the main substances (influenced/ influencing) the growth of young animals.
6. The amount of vitamins A and D (requiring/ required) varies in different countries.
7. The fat droplets (carrying/ carried) most of vitamins A are (stabilizing/stabilized) by phospholipids in milk.
8. The calcium/phosphorus ratio (finding' found) in milk is (considering/ considered) to be the most favourable.
9. Milk is rich in all the minerals (needing/ needed) for normal body functioning.
10. Milk (containing/ contained) as little as 12 percent total solids is (referring/ referred) to drinks rather than food.

III. Change the italicized clauses into participial constructions.

Milk *that is produced by reindeer*, animals *that are used for milk production*; sheep milk that *is consumed in South European countries*; the cow *which produces milk with the highest fat content*; female mammals *that produce milk for their young*; infants *who drink mother's milk*; nutrients *that differ in proportions in milk that is produced by various species of mammals*; senior citizens *who receive enough calcium in their diet* to compensate calcium *that is lost from the body.*

IV. Choose the correct form of participle I.

1. (Being added/ Having added) to children's diet milk enhances their growth both in height and weight.
2. (Using/ Having been used) skim milk instead of whole milk, researchers obtained the j same growth in height increase.

3. (Having lost/ Being lost) regularly from the body, skeletal calcium has to be compensated.

4. (Being contained/ Containing) the most favourable calcium/ phosphorus ratio, milk is considered the best nutritional source of calcium.

5. (Having processed/ Having been processed) milk is turned into a great number of tasty and useful dairy products.

6. (Having domesticated/ Having been domesticated) animals supplied man with milk, meat, leather and some other valuable products.

7. (Having been secreted/ Secreting) as tiny fat globules, fat is stabilized by phospholipid and protein contained in milk.

8. (Carrying/ Having carried) vitamin A and cholesterol, milk fat is essential for making up a proper diet.

9. Fatty acids deficiency may lead to effects similar to effects (being resulted/ resulting) from vitamin deficiency.

10. (Having destroyed/ Being destroyed) by heating, vitamin C is typically deficient in milk.

V. Replace the clauses m italics by constructions with the appropriate form of participle I, making necessary changes in the principle clause.

1. *After milk has curdled*, it is separated into liquid and solid phases.

2. *If a man was breast-fed in infancy*, he does much better at school and university.

3. *After man found milk to be valuable food*, he domesticated mammals.

4. *Skim milk has recently started being used for the manufacture of a lot of dairy products*, it has acquired greater importance than before.

5. *When infants are fed mother's milk*, they are healthier and develop better.

6. Human milk is lower in proteins and minerals than either cow's or goat's milk, *but it is higher in lactose*.

7. Composition of milk may be Afferent, *it is affected by the cow's breed, age, health, and stage of lactation.*

8. *When a cow is given feed of poor quality*, it produces little milk low in total solids.

9. *As milk is processed into a great number of products*, it can provide a varied and lasts diet.

10. *Since cows are most often raised throughout the world*, they can be called the principal animals *that supply man with milk*.

VI. Open brackets and use the proper form of participle I.

1. (To feed) with a proper amount of milk, children grew and develop well.

2. (To consume) one litre of milk a day, a person could obtain only 1,8 mg of niacin.

3. (To use) by various fermenting bacteria, lactose plays an important role in many biological processes.

4. (To meet) the enzyme lactase, lactose broke down into simple sugars such as glucose and galactose.

5. (To domesticate) many centuries ago, reindeer became popular animals for milk

production in northern Europe.

6. (To compare) with cow's and goat's milk, human milk is relatively low in proteins and minerals.

7. (To apply) computer technology for preparing feeding programs, farmers achieved greater efficiency from each animal.

8. (To fortify) with the fat-soluble vitamins A and D, the milk met human nutritional needs.

9. (To use) as the main constituent of the brain tissue, galactose is an essential nutrient at early stages of human development.

10. (To break down) into monosaccharides, lactose is absorbed from the digestive tract.

VII. Name the sentences containing the absolute participial construction. Translate into Russian.

1. Skeletal calcium being turned over annually, people need consistent source of dietary calcium throughout their life.

2. Skim milk being fed, the growth in height is ensured as mush when whole milk is fed.

3. Calcium is of great importance to the health of people, about one-sixth of the skeletal calcium being turned over annually.

4. Being turned over annually, the skeletal calcium is of great importance to the health people.

5. Senior citizens consuming dairy products regularly compensate the losses of skeletal calcium.

6. Having decreased the consumption of dairy products, senior citizens could not ensure adequate amount of dietary calcium.

7. Milk is rich in calcium, the latter being of great value to the health of people.

8. Senior citizens consuming dairy products regularly, adequate amount of dietary calcium is ensured.

9. Minerals being contained in optimum proportions for absorption into blood, milk is an essential source of them.

10. Milk is consumed both in fresh and processed forms, with most of it being used as raw material for dairy industry.

VIII. Substitute words "that" and "those" are used if they denote a thing or person similar to the thing or person denoted by the noun they replace.

e.g. The nutrient composition of goat milk is about **the same** as that of cow milk.

"One(s)" is used to substitute for a noun if the same thing or person or their part are mentioned.

e.g. Milk contains carbohydrates, the principle one is lactose.

Besides, in order to choose the proper word-substitute in each particular case it is helpful to know patterns in which they are used.

that
those } + preposition + noun

that
those } + participial construction

those + clause

the one(s) + preposition + noun
a(n) / the + adjective + one
possessive pronoun + one(s)
adjective + ones (instead of countable nouns)
the + ordinal numeral + one

this
that
another
the other
which
such (a) } one

the one(s) + participial construction
(the) one(s) + clause

Fill in *that, those, one, ones.*

1. Man keeps cattle for meat and dairy purposes. Animals raised for milk typically require more daily care than ... raised for meat.
2. Human milk is lower in proteins and minerals than ... of cows and goats.
3. Laboratory test shows that today's milk contains less foreign materials than delivered yesterday.
4. The presence of more iron and copper in milk is undesirable as they are able to destroy some chemical compounds especially the ... referred to vitamins.
5. Senior citizens, especially the ... that consume small amounts of dairy products, may develop calcium deficiency.
6. Calcium deficiency in children and young people leads to retarded growth, while calcium deficiency in ... over middle age promotes bone fragility and dental tissue decay.

7. A lot of modem diets include various dairy products, especially low fat.

8. Of all animals producing milk cow can be considered the principle.

9. The development of skeleton is as enhanced by adequate milk consumption as of brain.

IX. Substitute *that, those, one, ones* for the repeated italicized nouns.

1. The emergence of new technologies, including the technology using radioisotopes, has made it possible to investigate transport of various minerals in the body.

2. People don't typically consume adequate amounts of milk, especially people over middle age and older people.

3. Calcium content in older people's bones is typically lower than calcium content found in bones of younger people.

4. Percentage of potassium, chloride, and magnesium in milk is much lower than percentage of calcium and phosphorus.

5. Such minerals as calcium and phosphorus are known to be the most important minerals for skeleton growth.

6. Milk is food both for the old people and the young people.

7. Man puts in a lot of effort in manufacture of food both tasty and good for health. Such food as milk, however, is provided by nature itself.

8. Milk producing animals are kept throughout the world, which milk producing animals, are more characteristic of a particular country depends on its climate, traditions, and other factors.

9. The processing technology used for cows' milk is also applied to milk obtained from other animals.

10. This milk cannot be used for processing into cheese unlike the milk delivered earlier.

X. Substitute Passive forms for italicized Active forms, mentioning the doer of the action where necessary.

1 .After man had domesticated animals he enriched his diet.

2. They will fortify skim milk with vitamin A.

3. Researchers have established the importance of vitamin A for good eyesight.

4. People are developing new dairy products and improving old ones.

5. Fat droplets carry most of vitamin A and the cholesterol.

6. Certain cells in the mammary glands secrete milk fat.

7. Researchers can find most B vitamins only in trace amounts.

8. People can obtain about one-half of the required riboflavin from dairy products.

9. Adults should increase consumption of milk and dairy products.

10. Dairy lab assistants are to test certain portion of milk delivered for presence of heavy metals and other pollutants.

Part II. Concentrated and frozen milk products

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 flavour. 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 loads[1] 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[2] 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 flavour 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[3] and spray dryers[4], 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[1]). Total production of frozen desserts containing milk approximated more than 3000 million litres in the 20"" century, 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[2].

The following characteristics are desirable for frozen desserts: fine flavour, smooth texture, moderately resistant body, optimal overrun[3] (amount of air-whipped in), resistance to heat shock[4], attractive appearance, ability to be dipped[5], homogeneous appearance on meltdown, proper freezing (melting) point, nutrition, economy, and ability to refresh[6].

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 solids[1] (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 flavouring. There exist a wide range for producers to vary content of both milk fat and nonfat milk solids, the quantity of one components 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 hat in finished form it must contain at least 1,4 percent egg yolk[2] solids.

Plain ice creams contain colouring and flavouring ingredients (such as vanilla, coffee and maple syrup[3]) no more than 5 percent of their unfrozen volume. Bulky flavoured ice creams may contain lower concentrations of milk fat and total milk solids than plain ice cream to the extent that flavouring 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”[4] ice cream. It contains between 2 and 7 percent milk fat and at least 11 percent total milk solids. Bulky flavours of ice milk, unlike ice cream, must contain as much total milk solids as plain flavours. 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[5].

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[6]. Immitation ice cream, known as meliorate, is made in some parts of die 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 intented 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. popcicle - 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, flavouring, and stabilizer, cheaper ingredients such as dry whey, com syrup, and artificial flavourings 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, com 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

clump[1]. 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 freezing[2], which uses a steady flow of mix, or batch freezing[3], 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.

Semifrozen ice cream leaving the freezer at a temperature between -9° and -5°C is placed in a suitable container and conveyed to a blast freezer[4], 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 room[5] 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 flavours available throughout the year. Most ice cream manufacturers make a standard mix consisting of milk, cream, sugars, and stabilizers, to which flavours may be added just prior to freezing. There exist various types of flavours, such as high-volume flavours (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[6] packaging materials have made it possible to store frozen products for six months or longer without loss of flavour 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, flavour, body, texture, colour, 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. continuos 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

Revision II

Answer the questions:

1. What are concentrated and dried milk products manufactured for?
1. How does condensed milk differ from evaporated milk in the percentage of total milk solids and milk fat?
2. Which type of milk product (condensed/ evaporated/ dried) can be stored longer?
3. What kinds of dairy products can be dried?
4. What is known about the origin of frozen milk desserts?
5. Why wasn't ice cream available to most people until the 19th century?
6. What are the most desirable characteristics of frozen dessert?
7. What are the requirements to the composition of frozen dairy desserts?
8. What does the term "overrun" mean?
9. What is the difference between plain and bulky ice creams?
10. Why have ice milks become popular with consumers?
11. What are the characteristics of sherbets?
12. What are ices composed of?
13. What imitation of ice cream is produced?
14. What are the steps of ice cream manufacture process?
15. How can the shelf life of ice creams be extended?
16. What are the main two methods of freezing the ice cream mix?
17. What operations in ice cream manufacturing allow producers to obtain smooth body j of the product?
18. Is the demand for ice cream constant throughout the year?

Grammar issues to be revised:

I. Gerund and its constructions.
II. Forms of gerund.
III. Modal verbs with different forms of infinitive.
IV. Finite forms of verbs.

I. Say in which sentences the word "manufacturing" is translated into Russian by means of a noun. Translate into Russian.

1. The manufacturing of ice cream is one of well-developed branches of dairy industry.
2. Manufacturing ice cream is known to have increased dramatically in America at the beginning of the 20th century.
3. Manufacturing "reduced fat" ice cream producers try to meet the needs of consumers.
4. Plants manufacturing dry milk products are often built in conjunction with butter-churning plants.
5. Without manufacturing refrigerated tank-trucks it was impossible to deliver frozen products at a long distance.

6. Due to manufacturing various flavouring ingredients it has become possible to increase a variety of ice creams produced.

7. Customers know of the company manufacturing high quality frozen desserts.

8. Confectionery industry is interested in manufacturing condensed milk and other dry milk products.

II. Substitute -ing forms for nouns omitting prepositions as in the example.

Example: manufacture of ice cream → manufacturing ice cream

Homogenization of ice cream mix, evaporation of water, pasteurization of milk, storage of dry milk, production of condensed milk, facilitation of storage, refrigeration of milk, distribution of ice cream, stimulation of demand.

REMEMBER

Some verbs must be followed by gerund (an –ing form):

avoid *postpone/put off*
consider *practice*
delay *remember*
finish *suggest*
give up/stop *carry on/go on/ keep (on) (=continue)*

Some verbs are used in gerundial constructions with prepositions:

(dis)approve of-ing *stop smb (from) -ing*
decide against -ing *succeed in -ing*
insist on -ing *think of-ing* *prevent*
smb (from) -ing *warn smb against -ing* *speak of-ing*

The following verbs can be followed by –ing or to … with little or no difference in meaning: *begin, continue, intend, start*

The verb "*need*' is used in the following constructions:

need to do (= it is necessary to do it)
smth needs doing = smth needs to be done

The verb "prefer" is used as follows:

prefer doing/ to do (Am.)
prefer doing smth to doing smth else

The verb "try" is followed by -ing when it means "*do smth as an experiment or test* and it is followed by to ... when it means "*attempt to do, make an effort to do*".

There are some other constructions in which -ing, sometimes alongside -to is used:

III. Use the verbs in brackets in the form of gerund or infinitive, add prepositions where necessary.

1. After (to develop) mechanical refrigeration manufacturers had no difficulty (to start) (to produce) ice cream for mass consumption.

2. People tried (to make) ice desserts thousands of years ago.

3. The company tried (to install) the new refrigeration equipment as soon as possible

and succeeded (to commission) the new shop by summer.

4. The new brand of ice cream needs (to advertise).

5. Manufacturers need (to convince) consumers that ice cream is food rather than confection in order to increase demand for it throughout the year.

6. Reduced-fat ice cream became popular and started (to be produced) on a large scale after a campaign for healthy food was launched in America.

7. Sugar prevents bacteria (to multiply) in milk.

8. Manufacturers of candy, bakery goods, ice cream and other foods are interested (to obtain) milk that can be stored at room temperature.

9. The reason (to substitute) dry milk for concentrated one in this factory is that it is less perishable.

10. A stabilizer is added to milk to avoid (to separate) during storage.

11. The manager considered the advantages (to sell) the by-products to another company instead of (to process) them themselves.

12. Such ingredients as dry whey, com syrup, and artificial flavourings are used in ice cream manufacture for the purpose (to make) a lower-cost product.

13. The manager intends (to substitute) artificial flavourings for juice.

14. Without (to age) the ice cream mix the manufacturer will have difficulty (to obtain) a smooth product.

15. The board of directors approved (to give up) (to use) the hardening room and (to substitute) a hardening tunnel for it. But they decided against (to begin) (to reconstruct) the storage area.

IV. Choose the proper -ing form.

1. After (leaving/ being left) the freezer at 9°C semifrozen ice cream is placed in a suitable container.

2. Consumers were informed of producers (having added/ having been added) chocolate, vanilla, fruit and other flavours to frozen desserts.

3. Some people enjoy (having eaten/ eating) dietetic and diabetic frozen desserts as they contain less fat.

4. We know of Frank Epperson (having invented/ having been invented) Popsicles in 1923.

5. The shelf life of dried milk products was extended due to their (having been dried/ being dried) to less than 4 percent moisture.

6. Many plants increased the production of useful dry products by (having been utilized/ having utilized) skim milk, buttermilk, cheese whey etc as raw materials.

7. The improvements in ice cream manufacturing were impossible without special refrigeration equipment (developing/ having been developed).

8. Producers are interested in frozen desserts (consuming/ being consumed) not only in summer, but throughout the year.

9. Government inspectors were satisfied with all ingredients of ice cream (having been listed/ being listed) and the amount of some additives (having been limited/ being limited) in frozen dairy desserts.

10. We know of Americans (starting/ having started) wholesale ice cream business in 1851.

V. Translate into English parts of sentences given in Russian using proper forms of gerund or infinitives. Pay attention to use of prepositions.

1. Stabilizers and emulsifiers are added to ice cream (с целью предотвращения образования кристаллов льда).
2. The manager intends (внести) some innovations in the method (производства) ice cream.
3. Because of comparatively higher prices for ice cream people in some parts of the USA (предпочитают покупать меллорин вместо того чтобы покупать мороженое).
4. Manufacturers (практикуют обогащение) evaporated milk with vitamins A and D.
5. Condensed milk is produced (частичным удалением воды) from a mixture of milk and sweetener.
6. Water is removed from milk (для удлинения срока его хранения).
7. Ultrahigh temperature processing and aseptic packaging techniques (не дают сгущенному молоку портиться) for several months.
8. This dairy farm (продолжает использовать) old techniques (вместо того, чтобы внедрять) new ones.
9. (Перед тем, как построить) the drying plant (с целью переработки) skim milk and buttermilk the firm considered (возможность переработки) not only its own milk but also that delivered from small farms in the neighbourhood.
10. (Без добавления стабилизаторов и эмульгаторов) ice crystals may form if temperature fluctuates during storage.
11. Although there is a trend toward more uniform monthly ice cream consumption in the USA, people still (продолжают покупать) more frozen desserts in summer.
12. The firm (преуспела в увеличении) its sales of ice cream (посредством использования) new flavours which rapidly gained popularity.
13. The production manager (предложил начать производство) new kinds of frozen desserts.
14. The firm made a decision (отложить начало использования) airtight packaging till autumn.
15. The sales manager stated that the assortment of ice cream produced by the firm (требует улучшения).

VI. Say in which sentences there are modal verbs. Translate into Russian.

1. We were sure we should succeed in introducing the new flavours to the market
2. The purpose of concentrated milk foods production is to supply cookery with nonfat dry milk.
3. To obtain condensed milk water should be partially removed from the mixture of milk and suitable sweetener.
4. All dairy products must be labeled before selling.

5. Evaporated milk has to be fortified with vitamins A and D to meet the required standards.

6. Due to smaller amount of milk fat dry milk products have been stored safely for several months.

7. Most products have to be dried to less than 4 percent moisture to prevent bacterial growth.

8. Sweetened condensed milk ought to be pasteurized before being placed in a container.

9. The consumption of various frozen desserts has increased recently especially due to new flavours.

10. The recipe of making milk ices is likely to have been brought from the Far East.

11. Rapid freezing of ice cream mixture was to prevent the formation of large ice crystals.

12. Ice cream had had 20 percent milk solids before nuts and cookies were added, after which the milk solids content was found to be 18 percent.

VII. Fill in *can, may, be able, must, should, ought, have to, be to* in the appropriate form.

1. Manufacturers enrich their assortments of ice cream regularly if they want to stay in business since competition in ice cream production is very strong.

2. Ice cream be stored for several months if it is kept below 20° C.

3. Microbiological tests be carried out for all frozen desserts before their delivery to consumers.

4. The overrun for ice cream and ice milk ... be about 65 to 100 percent.

5. Mellorine be produced in places where butterfat prices are higher than vegetable fat ones.

6. According to standards sherbets contain about 2 percent milk fat and 5 percent total milk solids.

7. All sherbets be sold either in hard or soft frozen form.

8. Concentrated milk products be easily diluted by a less concentrated form of milk.

9. Such characteristics as fine flavour, smooth texture, optimal overrun be ensured by manufacturers.

10. The new equipment be adjusted again It have been mishandled by the worker.

11. By agreement with the production manager's office, the development of the new ice cream recipe be completed in a month.

12. The development of the new ice cream recipe be completed in a month, otherwise the factory will not to start producing the new product by the summer season.

13. Before introducing new flavours the company to carry out market research and study the demand for its competitors' products.

14. Milk ices have first been made in the Far East.

15. Ice cream not become widespread product before mechanical refrigeration came into being.

16. Rather warm climate with long hot summers on the major part of the US territory

have stimulated the development of frozen desserts in the country.

17. For dietetic reasons, low-fat products to be substituted for products made of whole milk and cream.

18. Russian manufacturers develop diabetic frozen desserts as the latter are practically absent at the Russian market.

19. Dairy products provide a lot of essential nutrients for man.

20. The patient asked the doctor if he eat products containing sugar or if he still keep to the sugar-free diet.

VIII. Translate the Russian parts of the sentences by means of modal verbs, use the proper form of the infinitive of the verb in brackets.

1. The 1904 World Fair (должно быть стимулировала) production and consumption of ice cream in the USA.

2. With skim milk and buttermilk processed and sold, the farm (могло бы работать) more efficiently. But unfortunately, the fanner stuck to old ways and only used these valuable products in feeding young animals.

3. Moisture (должно быть попала) into the can with dry milk. Nothing else (могло бы вызвать) its spoilage.

4. About 40 grams of protein (следует потреблять) by man every day.

5. Ice milk (можно назвать) reduced fat ice cream.

6. Some kind of ice cream (возможно изготовлялось) by the Romans in the fourth century BC.

7. Fat and total milk solids content (должно быть уменьшилось) due to bulky components having been added.

8. Greater popularity of ice milk (должно быть обусловлена) by people's desire to consume less fat.

9. All ingredients of frozen desserts (должны быть перечислены).

10. With enough experts and more investments, Russian manufacturers (могли бы производить) long ago as many kinds of frozen desserts as are made abroad.

IX. Use the verbs in brackets in the appropriate form, add prepositions where necessary.

1. Man (to try) (to find) methods (to preserve) milk for a long time and (to succeed) (to solve) the problem by means of (to dry) milk, (to condense and to evaporate) it and (to add) certain classes of bacteria to it.

2. Before ice cream (to start) (to produce) on a mass scale it for centuries (to make) in small amounts for the rich.

3. If advertising (to convince) people to consume a lot of ice cream throughout the year ice cream manufacturing (to become) still more profitable and dynamically developing industry.

4. This method (to dry) milk (to use) for a long time before manufacturers (to give up) it and (to begin) (to use) more effective ones.

5. Milk evaporation (to use) for hundreds of years and still (to remain) one of the most effective methods (to preserve) milk.

6. If water (to remove) from milk it (can) (to store) for longer periods.

7. One of the shops in the factory (not to work) now, new equipment (to install).

8. Man (to start) (to use) additives to frozen desserts very early in history.

9. Since modern methods (to preserve) milk (to develop) food industry to a great extent (to give up) (to use) fresh milk.

10. In the 20^{th} century ice cream (to become) one of the most popular desserts all over the world.

Part III. Cultured Dairy Products

Text 8
Cultured dairy foods

Soon after man began to use milk from animals he discovered that if it was not soon consumed it became sour and coagulated due to bacterial contamination of milk. People are believed to have started making fermented milks since early times, when they began to add small portions of common *Streptococcus* and *Lactobacillus bacteria* (often called "cultures") in warm milk from cows, sheep, goats, camels, or horses. These bacteria were found to be harmless lactic acid producers, thus especially effective in lowering the pH and in inhibiting growth of pathogenic organisms. So, it was possible to prevent milk from spoilage and to preserve it fresh for several days or weeks without refrigeration.

Having discovered that fermented milks were edible and delicious, tribes developed their own systems of handling the product. Thus, several varieties of fermented milk were developed and they are likely to have been introduced around the world as people migrated. Nowadays cultured buttermilk, acidophilus milk, sour cream and yogurt are sure to be among the most common fermented dairy products in the Western world. Less known products, such as kefir, koumiss, and new yogurts containing *Bifidobacteria* are likely to be more popular in Eastern Europe and Russia. Both kefir and koumiss contain from 1,0 to 2,5 percent alcohol, produced by yeasts that ferment lactose. Koumiss is typically made from mare's milk, while kefir from the milk of goats, sheep, or cows.

Nowadays the term "cultured milks" is used more widely throughout the world, because pure bacterial cultures are used in commercial manufacture. Although, it is appropriate to use the words fermented or sour because lactic acid which causes sourness, is produced by fermentation of milk sugar - lactose.

Researches have shown that the initial fermentation process, which involves the partial conversion of lactose to lactic acid, is the basis for the production of cultured milk, lactose conversion being accomplished by lactic-acid producing *Streptococcus* and *Lactobacillus bacteria*. At temperatures of about 32°C, these bacteria reproduce very rapidly, practically doubling their population every 20 minutes. Many by-products that result from their metabolic processes assist in further ripening and flavouring of the cultured product. Subsequent fermentation can result in the production of other compounds, such as diacetyl (a flavour compound found in buttermilk), alcohol (from yeasts in kefir), as well as butyric acid (which causes bitter flavours).

With the development of microbiological and nutritional sciences in the late 19^{th} century the technology producing cultured dairy products on an industrial or commercial basis was established. Recently, researchers have discovered acidophilin, lactocidin, and lactolin, in addition to the earlier discoveries of nisin and dipiococcin, all these substances being antibiotics produced by bacteria used in milk fermentations.

Regardless of the type of cultured product, the same basic steps are necessary in processing through incubation, these steps are: (1) starter culture preparation, (2) treatment of milk, skim milk, cream, or other product (e.g., pasteurization and homo-genization), (3)

inoculation, and (4) incubation. If the product is to be fluid for drinking, the curd must be broken and agitated to produce a smooth homogenous body. After incubation, and agitation if necessary, cooling is essential to stop the development of acidity. Liquid products are then ready for packaging, although some producers package yogurt and cultured cream before incubation.

Being excellent sources of calcium and protein, cultured dairy foods provide numerous potential health benefits to the human diet. In addition, they may help to establish and maintain beneficial intestinal bacterial flora and reduce lactose intolerance.

Text 9
Cultured buttermilk

Because of its name, most people assume buttermilk is high in fat. Actually, the name refers to the fact that buttermilk was formerly the watery end-product of butter-making, and thus it was used as a beverage. Today this product is mostly dried for use in the baking industry. Modern buttermilk is made from low-fat or skim milk by fermentation with Streptococcus cremoris and Leuconostec citrovorum, so it has less than 2 percent fat and sometimes none. “Cultured low-fat milk'' or “cultured nonfat milk” are sure to be more correct names for buttermilk produced now.

Several factors including microorganisms, milk, and processing interact to give the end product its body and flavour characteristics. Therefore, flavour, aroma, body, texture, and appearance vary from plant to plant and from day to day. For this reason, processors should j minimize variables so they can supply buttermilk that is consistently homogeneous.

Both fat or skim low-fat milk are used as the starting ingredients for buttermilk, but when j the latter is used, nonfat solids should be added to increase total solids to 12.0 - 13.5percent. Then milk is pasteurized at 82° to 88°C for 30 min, or at 90°C. for 2-3 min. Heat in pasteurization should be sufficient to destroy all naturally occurring bacteria as well as whey proteins, thus increasing viscosity, releasing compounds containing sulfur which reduce i harshness of flavour.

Milk is then cooled to 22°C. and inoculated with 1 percent starter cultures of desirable j bacteria, incubation at the next stage lasting for 12 to 14 hours. Besides above mentioned cultures, either S. Lactis or L. Dextranicum can be added to develop buttermilk acidity and unique flavour. Flavour components produced by these types of bacteria include lactic acid, diacetyl, volatile organic acids (formic, acetic, propionic, butyric, and valeric acids), acetaldehyde, and ethanol. Thus, to obtain desired flavour producers can use these cultures separately or in combination.

The proper time to stop fermentation of cultured products is best determined by observing flavour, aroma, and acidity. Of course, titratable acidity[1] is influenced by the quantity of milk solids contained. For skim milk containing 9,0 percent nonfat solids, acidity should be 0,85 percent.

At the next step the product is cooled to 4°C with mild agitation to minimize the incorporation of air. It is butter granules that are often added to increase flavour and

attractiveness. Having been packaged, the final product is refrigerated.

There are approximately 43 calories per glass (that is 125 grams) of cultured buttermilk made from skim milk. The protein of buttermilk is sure to be especially easily digested due to the high heat treatment of processing and the effects of lactic acid.

1. titratable acidity - титруемая кислотность

Text 10
Cultured sour cream and dips

Consumers have grown fond of the smooth, custardlike body and delicate aromatic acid flavour of cultured sour cream, cultured half-and-half, and cultured dips. Cultured cream must contain not less than 18 percent milk fat, whereas sour half-and-half contains about 10 percent fat. Therefore, these products compare favourably caloriewise with mayonnaise, salad oils,

and other oil-base dressings, supplying only one-fourth to one-half as many calories in equivalent quantities. Dips made from sour cream or sour half-and-half contain a lower percentage offat because they are diluted by flavourings.

Procedures for the manufacture of cultured cream resemble those for cultured buttermilk. However, homogenization is an important extra step. Cream is pasteurized at 74°C for 30 minutes or 85°C for 25 seconds, then immediately homogenized at pressure. It may be homogenized again at either 80 to 85°C or at 40°C, double homogenization increasing viscosity. A mixed culture of bacteria that produce acid and those that produce flavour is added with thorough mixing. Incubation proceeds at 21 to 25°C for 8 to 14 hours. If a vat[1] is used for incubation, the finished product is pumped[2] by a pump through a special valve[3] that smoothes (homogenizes) the coagulum. Some processors prefer to incubate the inoculated cream in its final container.

Hot-pack[4] sour cream is produced by introducing stabilizer into freshly prepared sour cream, then heating, homogenizing, and packaging while hot in sealed glass or metal containers. Following such treatment procedure, one can extend shelf life of the product.

1. vat - чан, бак
2. pump - насос; качать насосом
3. valve - клапан
4. hot-pack - подвергать горячему консервированию

Text 11
Yogurt

Yogurt originated in Eastern Europe and it is believed to have been food in the Balkan countries for at least 2000 years. Even today, the consumption of yogurt is more than 10 times greater per capita in Europe than in the United States. However, sales of yogurt in the United States as well as in Russia have increased in recent years more than those of any other item in the dairy produce. This is largely due to the introduction of fruit-flavoured yogurts and to an increased appreciation among consumers of the low-calorie, highly nutritional aspects of yogurt. Its most popular uses are as a between-meal snack, as a dessert, and as the noon meal.

Yogurt is made in a similar fashion to buttermilk and sour cream, but it requires different bacteria and temperature. Despite the different spellings used (*yogurt, yoghurt, yahourt, yaourt, leben, mudzoon, luija, anddahi*), the product is fermented by *Lactobacillus huigciricus* and *Streptococcus thermophilus* in all countries except Turkey, where a yeast that ferments lactose is included. Being highly digestible, yogurt contains large quantities of protein, lactose, and B-vitamins.

Traditionally, the product is said to have been made from milk concentrated by boiling. Today yogurt is made from homogenized whole, lowfat, or skim milk which are fortified with nonfat dry milk or fresh condensed skim milk in order to raise the total solids to 14-16 percent. Skim milk without added solids has been found to contain only 8,5 to 9 percent total milk solids. However, by increasing the milk solids one can increase the body firmness of yogurt.

At the next step the mixture is heat-treated and then cooled to 45,6°-46,7°C. At this point a mixture of *Lactobacillus bulgaricus* and *Streptococcus thermophilus* cultures is added to the warm milk.

High incubation temperatures (41 to 45°C) are required by these bacteria, and their balance in the culture is determined by the temperature selected. Also, the ratio of one to the other in the inoculum must be controlled to produce favourable body and flavour characteristics. Usual ratios are 1:1 to 1:3, *L. bulgaricus* to *S. thermophilus*, though a harsh acid flavour may occur when *L. bulgaricus* predominates. Lactic acid, acetic acid, and acetaldehyde produced by these cultures were found to be important contributors to adequate yogurt flavour.

To obtain flavoured yogurt sugar and fruit are added to the obtained mixture, two different processing methods having been developed for the manufacturing of two popular types of fruit-flavoured yogurt known as Swiss and Sundae.

Fruit, flavouring, and colour are distributed throughout Swiss - or French style yogurt. According to the technological process, the milk is allowed to incubate in large heated tanks. After coagulation occurs, the mixture is cooled, fruit or other flavours are added, and the product is placed in containers and immediately made ready for sale.

Fruit is placed at the bottom of the cup with yogurt on top to make Sundae-style yogurt. For its production the cultured mixture is poured[1] into cups containing the fruit, held in a warm room until the milk coagulates (usually about 4 hours), and then moved to

a refrigerated room.

Sundae-style yogurt causes fewer problems to the processor since fruit has a tendency to settle out[2] in Swiss-style yogurt. Bacteria may attack portions of the fruit filling of Swiss-style yogurt, and dilution of fruit flavouring with yogurt reduces its preservative capacity.

Many yogurt manufacturers have added *Lactocacillus acidophilus* to their bacterial cultures, which is known to have possible health benefits in easing yeast infections and restoring normal bacterial balance to the intestinal tract of humans after antibiotic treatment.

1. to pour - зд. разливать
2. to settle out - погружаться

REVISION III

Answer the questions:

1. Why did people begin to add some bacteria to milk?
2. What cultured dairy products are known in the world and where are they more popular?
3. What kind of milk is koumiss and kefir made from?
4. What fermentation process is the production of cultured milks based on?
5. What are the main steps of cultured milks production?
6. Why are cultured dairy foods important in human diet?
7. How did people identify buttermilk many years ago?
8. What is modem buttermilk made from?
9. Why is it necessary to pasteurize milk manufacturing buttermilk?
10. How can producers obtain the desirable flavours of buttermilk?
11. Why is cultured cream so popular with consumers?
12. How is cultured cream manufactured?
13. When did yogurt originate?
14. Is yogurt sold only in the USA now?
15. What is the difference in the production of yogurt and buttermilk?
16. What substances is yogurt rich in?
17. How does Swiss-style yogurt differ from Sundae-style one?

Grammar issues to be revised:

1. Functions of infinitive in the sentence.
2. The infinitive construction "Complex Subject".
3. The infinitive construction "Complex Object".

I. Say in which sentences the infinitive is 1) the subject of the sentence; 2) the adverbial modifier of purpose. Translate into Russian.

1. To use dried buttermilk is common practice in baking industry.
2. To add non-fat solids to buttermilk made of fat milk is needed to increase total

solid content to 12.0 - 13.5 percent.

3. To prevent milk from spoilage harmless bacteria are added.

4. To convert lactose into lactic acid is the main purpose of both Streptococcus and Lactobacillus bacteria.

5. To produce pure bacterial cultures is especially important for commercial manufacturing of various yogurts.

6. The main problem of the Sundae-style yogurt production is to place and keep fruit at the bottom of the cup.

7. At the stage when the required acid pH and flavour are reached, buttermilk is rapidly cooled in order to stop fermentation.

8. Skim milk or low fat milk is fortified with nonfat dry milk to raise the total solid.

9. Most yogurts marketed now are to contain about 15 percent milk solids.

10. To consistently manufacture a product with definite characteristics is essential in order to attract customers and survive in competition.

II. Substitute infinitives of purpose for the italicized parts of the sentences. You may add the words "in order" in some sentences. Make necessary changes.

Model: These new techniques were adopted *because the manufacturers wanted to accelerate the production process.* These new techniques were adopted **(in order) to accelerate the production process.**

1. Manufacturers have to use a lot of advertising if they are to increase sales.

2. Cooling cultured products is essential if we want to avoid the development of acidity.

3. People should include cultured dairy products in their daily diet for the purpose of establishing and maintaining beneficial intestinal bacterial flora.

4. Buttermilk is dried and then it is used in the baking industry.

5. Producers should minimize variables for the purpose of supplying consistently homogeneous buttermilk.

6. Cultured cream is homogenized twice/or the purpose of increasing viscosity.

III. Say in the translation of which sentences you have to add the word "который" Translate into Russian.

1. Small portions of harmless bacteria to be added for making fermented milks are often called cultures.

2. To prevent milk from spoilage it is necessary to lower the pH.

3. If a cultured product is to be fluid, the curd should be broken.

4. Butter granules are often added to buttermilk to ensure flavour.

5. Dips to be diluted by flavourings are known to contain a lower percentage of fat.

6. The usual ratios to be maintained between two types of bacteria in the inoculum are 1:1 or 1:3.

IV. Change the italicized clauses into infinitives used as attributes.

Model. The total solid content *that must be reached in buttermilk* is 12.0-13.5

percent.

The total solid content **to be reached in buttermilk** is 12.0-13.5 percent.

1. Cultures *that are to be used in the process of making yogurt* are Lactobacillus bulgaricus and Streptococcus thermophilus.

2. The affects *that can be produced on human body by cultured dairy products* are lower pH and inhibited growth of pathogenic organisms.

3. By-products *that will result from metabolic processes of bacteria* help the cultured product ripen.

4. The problem *that has to be solved in making Swiss-style yogurt* is to prevent fruit filling from being attacked by bacteria.

5. In choosing products *that will be produced* a manufacturer has to consider both consumers' tastes and the presence of similar products at the market.

6. The processes *that have to take place* before milk is turned into a cultured product are Pasteurization and homogenization, inoculation, and incubation.

V. Combine the two sentences into one using *too* and *enough*. Make the necessary changes.

Model 1: The introduction of these techniques is expensive. It can't be effected in small clones. The introduction of these techniques is *too* expensive to be effected in small factories.

1. The sales of yogurt in the US and Russia have increased rapidly in recent years. They can't be outpaced by any other dairy products.

2. The content of Lactobacillus bulgaricus in the product was very high. Adequate smooth flavour could not be obtained.

3. The effect of the antibiotic treatment was very strong. It couldn't be overcome with the help of cultured dairy products alone.

4. Transportation costs are very high. They make delivery inefficient.

5. The temperature is too high. It does not allow of storage without refrigerating the product.

Model 2: The fat content is not very high. It does not meet the standard. ⟶
The fat content is not high *enough* to meet the standard.

1. Cultured milks are used widely. They can be called an essential component of Western diets.

2. Cultured dairy products contain enough calcium and protein. They can provide considerable health benefits to the human diet.

3. The fat content in sour half-and-half products is low. It makes them able to compete with mayonnaise, salad oils, and other oil-based dressings.

4. Yogurt is easily digestible. It can be recommended to people having serious digestive problems.

5. The culture Lactobacillus acidophilus is strong. It can restore normal bacterial balance in the intestinal tract of man after antibiotic treatment.

VI. Translate into Russian paying attention to the "infinitive-for" construction.

1. The introduction of these techniques requires too big investments for small dairy plants to effect it.

2. The effect of the antibiotic treatment on the intestinal tract was too strong for cultured milks alone to overcome it.

3. Koumiss produces beneficial enough effect on human health for its transportation to and marketing in areas where it is not traditionally produced to be justified.

4. The temperature was high enough for bacteria to reproduce rapidly.

5. For cultured dairy products to be produced commercially, the development of microbiological and nutritional sciences was needed.

6. Milk fermentation process has to occur for lactic acid to be produced.

7. It is necessary for manufacturers to develop new varieties and flavours of cultured dairy products as the competition is very high.

8. For fermented dairy products to vary in their taste and effect upon man, different methods of handling milk have been developed.

9. It is important for man to consume enough dairy products in order to have a balanced diet.

10. It is essential for cultured products to be cooled in order to prevent the development of acidity.

VII. a) Combine the two sentences into one using the "infinitive-for" construction, Make necessary changes.

1. The content of flavouring in the yogurt was high. The product didn't meet the standards.

2. The distance is very big. Fresh milk can't be delivered safely.

3. It is very warm in here. The product can't be stored at room temperature.

4. The new technology is easy. A lot of dairies throughout the country can adopt it.

5. The equipment is sophisticated. The workers can't operate it without training.

6. The curd has been broken and agitated well enough. Smooth homogeneous body has been obtained.

7. The temperature must be 32° C. At this temperature bacteria double their population every 20 minutes.

8. Yogurts are popular. Their popularity stimulates the development of new varieties and flavours. i

9. By-products of bacterial metabolic processes are essential. They help the cultured product ripen properly.

10. The product is cooled. At lower temperature less air is absorbed,

b) Change the sentences so as to use the "infinitive-for" construction.

Model: It is important that fermentation be stopped at the due time.

It is important for fermentation to be stopped at the due time.

1. It is necessary that milk be heated to a temperature at which bacteria are destroyed.

2. It is essential that manufacturers produce products that are not only nice to taste

but also appeal to the public's wish to buy healthy food.

3. It is necessary that incubation of inoculated milk last for 12 to 14 hours.

4. It is desirable that compounds containing sulfur be released during pasteurization.

5. It is important that the packaged cultured dairy product be refrigerated.

VIII. Open the brackets translating Russian words into English in proper forms so as to use the Complex Subject.

1. People (по-видимому) to assume buttermilk to be high in fat because of its name.

2. Cultured cream (как известно) to contain no less than 18 percent milk fat.

3. Bacterial cultures added to yogurts (как было установлено) to restore bacterial balance in the intestinal tract of humans.

4. In old times skim milk (как полагали) to be used only as animal feed.

5. Yogurts containing Bifidobacteria (как полагают) to have become popular in many European countries.

6. Kefir and yogurt (безусловно) to be the most popular dairy cultured beverages in Russia nowadays.

7. Milk (как известно) to coagulate due to bacterial activity.

8. Cultured dairy products (по-видимому) to have been known for thousands of years.

9. Mazzoni (как сообщают) to remain more popular in Georgia than any other dairy cultured beverage.

10. Sundae-style yogurt (как считают) to cause fewer problems than Swiss-style one.

IX. Open the brackets putting the verbs in proper forms so as to make the Complex Object. Translate into Russian.

1. Consumers (to want) yogurts with new flavours (to produce).

2. A specialist (to believe) the new method of packaging sour cream (to extend) its shelf life.

3. Nowadays everybody (to know) various dairy products (to be) good for health.

4. Manufacturers (to consider) acids (to produce) a more consistent quality of the product than cultures.

5. Specialists (to know) growth of pathogenic bacteria (to inhibit) by lactic acid in fermented foods.

6. A researcher (to believe) different ancient tribes (to develop) different systems of handling milk by chance and due to difference in environmental conditions and traditions.

7. A farmer (to know) cultures (to use) for dairy products as well as for other fermented goods, such as sausages, pickles, and sauerkraut.

8. Scientists (to believe) frozen culture concentrates (to become) popular because they retain their original activity during several weeks of storage.

9. The author of the book (to know) the first acidified products (to make) commercially early in the 1960s.

10. Most scientists (to think) some processors still (to prefer) to use mother cultures.

X. Match A and B.

A

1. Some people think cultured dairy products made at home
2. The health-promoting effects of Lactobacillus acidophilus
3. Most dairies have been found to buy cultures from supplies
4. Lactobacillus acidophilus was found to destroy
5. Yogurt is known to have traditionally
6. Frozen culture concentrates have been reported
7. The words “cultured”, “fermented” and “sour” are reported to be used
8. Manufacture of cultured and acidified products is considered

B

a. seem to have been known and used by man for over a century.
b. when speaking of dairy products made by means of adding bacteria to milk
c. to become immediately highly active, when thawed.
d. been made from milk concentrated by boiling.
e. as frozen concentrate or in the freeze-dried form.
f. to be tastier than those produced commercially.
g. to be highly dependent on scientific achievements today.
h. intestinal pathogens both in and out of the body.

XI. Transform the Complex Object into the Complex Subject, making necessary changes.

Model: *We know coagulation to result from* bacterial contamination of milk.
⟶ *Coagulation is known to result from* bacterial contamination of milk.

1. We believe cultured dairy products to have been consumed by man for thousands of years.
2. Researchers report yogurt to have been a food in the Balkan countries at least 2,000 years ago.
3. Dairy specialists know cultured low-fat milk and cultured nonfat milk to be names of I the same product.
4. Scientists consider milks fermented with Lactobacillus acidophilus to be able to I prolong man's life.
5. Researchers found nisin, diplococcin, acidophilin, lactocidin, and lactolin to be I antibiotics produced by bacteria in milk fermentation.
6. We know sour cream to be prepared in the same manner as buttermilk.
7. We say a culture to be a controlled bacterial population added to milk or milk products to produce specific characteristics of the final product.
8. Researchers report frozen culture concentrates to retain their original activity during several weeks of storage in liquid nitrogen.
9. We know not only cows' milk but also milk of other animals to be used in manufacturing dairy products.
10 Some producers believe better flavour to be obtained by culturing acidification.

Part IV Butter and Cheese

Text 12
Butter

When the making of butter originated is not really known. The Greeks are said to have learnt about butter from the Scythians, and the Romans from the Germans. Ancient Hindus are found to have valued cows according to the amount of butter that could be churned from their milk. Whatever the origin, butter has been used as food, and sometimes as a medicinal and for at least 5,000 years. However, it had not become perfect food before the application of modern science.

Delightful flavour of butter is due to about 50 different types of chemical compounds that e been identified in this product. It is the balanced quantity of various substances present in low concentrations that makes butter a particularly widely used and a major ingredient of -sings, confections, cookies, etc.

Butter is known to be one of the most highly concentrated forms of fluid milk. One I process twenty litres of whole milk to produce one kilogram of butter. This process is approximately 18 litres of skim milk and buttermilk, which at one time were disposed of as animal feed or waste. Today the skim portion has greatly increased in value, as it is fully in other products.

Commercial butter is 80-82 percent milk fat, 16-17 percent water, and 1-2 percent milk solids other than fat (sometimes referred to as curd). It may contain salt, added directly to the butter in concentrations of 1 to 2 percent. The addition of salt to butter is sure to contribute to our and also acts as a preservative. Unsalted butter often referred to as "sweet" butter should not be confused with "sweet cream" butter, which may or may not be salted. Reduced-it: "light" butter usually contains about 40 percent milk fat.

The colour of butter reflects the concentration of carotene, which is known as yellow, fat-soluble pigment and a precursor of vitamin A. This substance always presents in the cream fan which butter is made, but the colour of cream varies with seasonal changes in the carotene content of feeds. Thus, it is deep yellow when cows graze or are fed green forage and is pale yellow when dry feeds are fed in winter. As a result butter may contain added colouring, early buttermakers having added carrot juice in winter months to increase the intensity of colour in butter. Today manufacturers add food colouring throughout the year to ensure a consistent colour. Colouring may be an extract of annatto seed or synthetic beta-carotene. As both colouring materials are oil-soluble, therefore, having been added to cream before churning, they are not lost in the buttermilk.

As late as 1860, it was farmers who made all the butter in the USA. Since the last half of 19th century butter-making in the US became a factory operation, and the product was de from gathered cream. Farmers separated milk on the farm and shipped cans of cream to a butter factory, sometimes once or twice a week. The cream was often sour and needed to be neutralized (with sodium hydroxide) before churning.

When transportation and the value of the skim portion improved, whole milk was shipped to the creamery, providing a supply of "sweet cream" (i.e., cream that had not soured) for butter-making. These improvements were followed by the production of high-quality butter. Actually all butter in the United States today is sweet cream butter. A great exception is butter made from whey cream, which is used in the cheese-making process. The quality of fresh whey cream butter is indistinguishable from sweet cream butter.

Text 13
Butter Production

Butter is commonly churned from cream, although it may be churned from milk. Butter has been found to be produced when the cream emulsion in unhomogenized milk is destabilized by agitation, or churning. Being broken the emulsion produces butterfat granules with the size of rice grains, which meet together and separate from the water phase or serum as buttermilk.

At the next step the butterfat should be washed with clean water and "worked" (kneaded[1]) until more buttermilk separates and is removed. Finally, only about 16 percent of the water and milk solids presented in the original milk remain in the butter.

The churning process can take 40 to 60 minutes to be completed in a traditional chum, but butter is likely to be more commonly made by high-speed continuous "churns" in factories. Although the basic principle is the same, in the continuous churn cream is pumped into a cylinder and mixed by high-speed blades[2], forming butter granules in seconds. The butter granules are forced through perforated plates[3] while the buttermilk is drained from the system. One can add a salt solution if salted butter is desired. Being immediately packaged, butter is known to be kept well for a long time when it is frozen.

1. to knead - зд. перемешивать
2. high-speed blades - высокоскоростные лопасти
3. perforated plates - перфорированные (дырчатые) тарелки

Text 14
Quality aspects of butter

The quality of butter is based on its body, texture, flavour, and appearance, in the United States the Department of Agriculture assigning quality grades to butter based on its score on a standard quality point scale. Being the highest possible grade, grade AA butter must achieve a numerical score of 93 out of 100 points based on its aroma, flavour, and texture. If salt presents, it must be completely dissolved and thoroughly distributed. Grade A butter is almost as good, with a score of 92 out of 100 points, while Grade B butter is based on a score of 90 points, and it is usually used only for cooking or manufacturing. The flavour of Grade B is not as fresh and sweet, and its body may be crumbly[1], watery, or sticky[2].

It is not surprising that annual butter consumption has continued to hold at about 2.3

kg per person, although about 1 kg of margarine can be purchased for the price of 500 grams of butter. It is due to flavour and body of butter that many consumers prefer it to margarine. Dairy scientists and marketing specialists are sure to be finding ways to give butter an even better image by improving its spreadability[3] and resistance to oxidation. The demand for the product which for so long has been provided from milk for man is believed to be increasing.

1. crumbly - крошащийся, рассыпчатый
2. sticky - клейкий
3. spreadability - зд. консистенция

Text 15
The history of cheese-making

The real beginning of cheese-making is unrecorded in history. However, it must have occurred within a few centuries after the domestication of the cow and other mammals at about 8,000 BC. Records of cheese reach into ancient times in Arabia, Egypt, India, Israel, and Greece.

No one knows exactly who made the first cheese, but, according to one ancient legend, it was made accidentally by an Arabian merchant crossing the dessert. The merchant put his j drinking milk in a canteen made from dried sheep's stomach. His way was long, so he delayed sampling from the canteen[1] until he was thirsty. As he opened it at last, he was surprised to find not milk, but a thin watery fluid (called whey now) and snowy-white curd, which was the | world's first cheese. This transformation of milk can be easily explained. The natural rennin of the canteen, along with the heat from the sun, caused the milk to coagulate and separate into curds and whey. The whey is believed to have satisfied the traveller's thirst, and the curd had a delightful flavour and satisfied his hunger. However, it took more than one such experience with canteens made from stomachs and skins to teach people that stomachs contain a substance (the enzyme rennin) that causes milk to coagulate.

Cheese is known to have played an important role in the economy of many nations. It is found to have become one of the means of exchange because it provided milk in a more portable and less perishable form.

Rome was a rich market for cheese during the reign of the Caesars. Crusaders[2] brought secrets of cheese-making from the East back to Europe. During the Dark Age, these secrets were kept in monasteries. By the Middle Ages, there were many famous European cheeses, including Swiss, Sapsago, and Roquefort. Probably, the Romans under Julius Caesar took knowledge of cheese-making to England in their invasions and occupations.

In 1620, cheese and cows were part of the ship's stores carried to North America by the Pilgrims on the Mayflower. Since that time immigrants from England, the Netherlands, and other European countries brought a taste for cheese and knowledge of its manufacture to America.

Until the middle of the 19th century, cheese was a local farm product, only few varieties having been developed deliberately. Cheese makers in each region made cheese that ripened under specific conditions of air temperature and humidity, thus the product acquires certain characteristics. As there was little understanding of the bacteriological and chemical processes, cheese-making was likely to be an art and its recipe was kept secret passing down from one generation to the next.

In America the factory system of cheese-making was set up by Jesse Williams in New York in 1851. Then, it spread rapidly, especially to Wisconsin. In the 1920s there existed more than 4,000 small factories producing cheese in the USA, but by the 1970s there were only about 900 plants producing all cheeses and about 500 plants producing cottage cheese.

It is interesting that no other class of milk products or of any other foods has been so greatly differentiated as have cheeses. At first different varieties appeared mainly as a result of accidental changes or modifications in one or more steps of the process, as a result these changes were difficult to duplicate.

With increasing scientific knowledge came a greater understanding of the main processes that are necessary to produce many types of cheese. Nowadays, it has become possible to control more accurately each step and to manufacture a more uniform product.

There exist more than 2000 names of cheeses, although sometimes similar products have different names. Different types of cheese can be classified in many ways, but the most commonly used classification is based on cheese hardness (consistency) or ripening method. Thus, cheeses a- classified as: 1. very hard (30 to 35 percent moisture, ripened by bacteria Romano, Parmesan): hard (35 to 40 percent moisture, ripened by bacteria without eyes such as Cheddar, colby, provolone or with eyes such as Swiss, Emmentaler); 3. semisoft (40 to 45 percent moisture, ripened principally (Muenster, asigo) or by bacteria and microorganisms on surface (limburger, Port du by blue mould in the interior (Roquefort, Gorgonzola, Stilton); 4. soft (ripened by surface microorganisms with 45 to 52 percent moisture such as Brie, Cammembert or unripened with 52 to 80 t moisture such as cottage, cream, pizza).

Actually, there are so many types of cheese varying in flavour, aroma, body, and texture, that no gourmet[3] should ever become bored with cheeses.

Nowadays cheese producers are working hard at improving facilities, equipment, quality and of manufacturing methods. Mechanized and automated processes are being developed and tested, and most have already been applied in large plants. Production of curd by direct acidification has become a part of the manufacturing process of a number of cheese varieties. Immobilized enzymes become useful for the treatment of milk for cheese-making - both for coagulation and for I ripening. Cheese-making is considered to be now a science as well as an art.

1. canteen-зд. фляга
2. crusader - крестоносец
3. gourmet – гурман

Text 16
Principles of cheese manufacture

The principle upon which nearly all cheese-making depends is the coagulability of casein from milk. Casein can be precipitated by lowering the pH to its isoelectric point[1] with acid, or it will coagulate when kappa-casein (known also as k-casein, which is the stabilizing fraction casein) is sufficiently hydrolyzed. Hydrolysis is accomplished with rennin or similar enzymes. As the stabilizing power of k-casein is destroyed by rennin, the caseinate micelle[2] becomes increasingly sensitive to calcium ions, calcium sensitivity being affected by pH, heat treatment, colloidal phosphate, and other ions.

The simplest example of cheese-making is the natural souring of raw milk followed by erring to break the coagulum, then heating to shrink the curd, releasing whey. Curd is clipped whey and drained to provide fresh curd, the basic component of cheese. Removal of whey after precipitation of protein is the fundamental act common in the manufacturing of all cheeses.

Despite the seeming simplicity of this method, complexity in cheese-making still exists, as there is tat number of variables that may affect the process. These variables are composition of milk, types I relative numbers of microorganisms present, types and quantities of enzymes present, temperature of incubation, degree of souring, fineness and uniformity of broken curd particles, temperature and time of cooking, and completeness of whey drainage.

The next step includes the ripening of cheese curd and it is believed to be the most risky, for researchers have little idea of the curd's microbial and enzymatic contents. Most natural enzymes of milk remain active in cheese from raw milk, so if the pH is favourable, lipases and proteases will break down fat and protein. The curd is certain to contain a high amount of moisture, for it has not been pressed or otherwise treated adequately. Salt, which would inhibit certain microorganisms, has not been added. The curd has numerous openings in which air is trapped and, with its high acid content, yeasts and moulds would grow rapidly if a favourable temperature was ensured such as that often used in ripening (10 to 15 C).

1. isoelectric point - изоэлектрическая точка
2. caseinate micelle - мицелла казеината

Text 17
Main steps of cheese-making process

The cheese-making process consists of removing the major part of the water contained in fresh fluid milk while retaining most of the solids. Since storage life increases as water content decreases, cheese-making can also be considered a form of food preservation through the process of milk fermentation. The fermentation of milk into finished cheese requires several essential steps: 1) preparing and inoculating the milk with lactic-acid—producing bacteria, 2) curdling the milk 3) cutting the curd, 4) shrinking the

curd (by cooking), 5) draining or dipping the whey, 6) salting, 7) pressing, and 8) ripening. These steps begin with four basic ingredients: milk, microorganisms, rennet, and salt. Inoculation and curdling. Milk for cheese- making is supposed to be of the highest quality. Good farm sanitation and pasteurization or partial heat treatment are important to the cheese-making process, for the natural microflora presented in milk frequently include undesirable types called psychrophiles. In addition, the milk must be free of substances that may inhibit the growth of acid- forming bacteria (e.g., antibiotics). Milk is often pasteurized to destroy pathogenic microorganisms and to eliminate spoilage and defects induced by bacteria. However, since pasteurization destroys the natural enzymes found in milk, cheese produced from pasteurized milk ripens less rapidly and less extensively than most cheese made from raw or lightly heat-treated milk.

During pasteurization, the milk may be passed through a standardizing separator to adjust the fat-to-protein ratio of the milk. In some cases the cheese yield is improved by concentrating protein in a process known as ultrafiltration[1]. The milk is then inoculated with fermenting microogranisms and rennet which promote curdling.

Different fermenting microorganisms carrying out the anaerobic conversion of lactose into lactic acid, the type of organisms used depends on the variety of cheese and on the production process. Rennet is an enzymatic preparation[2] that is usually obtained from the fourth stomach of calves. It contains a number of proteolytic (protein-degrading[3]) enzymes, including rennin and pepsin. Some cheeses, such as cottage cheese and cream cheese, are produced by acid coagulation alone. In the presence of lactic acid, rennet, or both, the milk protein casein clumps[4] together and precipitates out of solution; and it is this process that is known as curdling, or coagulation. Coagulated casein assumes a solid or gellike structure (the curd), which traps most of the fat, bacteria, calcium, phosphate, and other particulates. The remaining liquid (the whey) contains water, proteins resistant to acidic and enzymatic denaturation (e.g., antibodies), carbohydrates (lactose), and minerals.

Lactic acid produced by the starter culture organisms has several functions. It promotes curd formation by rennet, which activity requires an acidic pH, causes the curd to shrink, enhances whey drainage, and helps prevent the growth of undesirable microorganisms during cheese-making and ripening. In addition, acid affects the elasticity of the finished curd and promotes fusion[5] of the curd into a solid mass. Being released by the bacterial cells, enzymes influence flavour development during ripening.

Salt added to the curd not only enhances flavour, but it helps to withdraw the whey from the curd and inhibits the growth of undesirable microorganisms as well.

Cutting and shrinking. Being formed, the curd is cut with fine wire “knives” into small cubes approximately one centimetre square and the following gentle heating causes its shrinking. The moisture content and the final consistency of the cheese are determined by the degree of shrinkage. Whey removed by draining or dipping may be further processed to make whey cheeses (e.g., ricotta) or beverages, or it may be dried in order to preserve it as a food ingredient.

Ripening. Most cheese is ripened for varying amounts of time in order to bring about the chemical changes necessary for transforming fresh curd into a distinctive aged cheese.

These changes are catalyzed by enzymes from three main sources: 1) rennet or other

enzyme preparations of animal or vegetable origin added during coagulation; 2) microorganisms that grow within the cheese or on its surface; 3) the cheese milk itself.

The ripening time may be as short as one month, as for Brie, or a year or more, as in the case of sharp cheddar.

The ripening of cheese is influenced by the interaction of bacteria, enzymes, and physical conditions in the curing room[6]. The speed of the reactions is determined by temperature and humidity conditions in the room as well as by the moisture content of the cheese. In most cheeses lactose continues to be fermented to lactic acid and lactates, or it is hydrolyzed to form other sugars. As a result, aged cheeses such as Emmentaler and cheddar have no residual lactose.

In a similar manner, proteins and lipids (fats) are broken down during ripening, the degree of protein decomposition, or proteolysis, affecting both the flavour and the consistency of the final cheese. It is especially apparent in Limburger and some blue-mould ripened cheeses. Surface-mold ripened cheeses, such as Brie, rely on enzymes produced by the white Penicillium camemberti mould to break down proteins from the outside. When lipids are broken down (as in Parmesan and Romano cheeses), the process is called lipolysis.

The eyes[7], or holes, typical of Swiss-type cheeses such as Emmentaler and Gruyere result from a secondaty fermentation that takes place when, after two weeks, the cheeses are moved from refrigerated curing to a warmer room, where temperatures are in the range of 20° to 24° C. At this stage, residual lactates provide a suitable medium for propionic acid bacteria (Propionibacterium shermanii) to grow and generate carbon dioxide gas. Eye formation takes three to six weeks. Then, warm-room curing is stopped and the cheese is moved back to a cold room, where it is aged at about 7° C for 4 to 12 months in order to develop its typical sweet, nutty[8] flavour.

The unique ripening of blue-veined[9] cheeses is due to from the mould spores Penicillium roqueforti or P.glaucum which are added to the milk or to the curds before pressing and are activated by air. Air is introduced by “needling”[10] the cheese with a device that punches[11] about 50 small holes into the top. These air passages allow mould spores to grow vegetative cells and spread their greenish blue mycelia, or threadlike structures, through the cheese. Penicillium moulds are known to be rich in proteolytic and lipolytic enzymes, and as a result a variety of trace compounds, such as free amines, amino acids, carbonyls, and fatty acids affecting the flavour and texture of the cheese are produced during the ripening process.

Surface-ripened cheeses like Gruyere, Port Salut, and Limburger derive their flavour from both internal ripening and the surface environment. For instance, the high-moisture wiping[12] of Gruyere surface gives that cheese more flavour than its Emmentaler counterpart. Specific organisms, such as Brevibacterium linens, in Limburger cheese cause a reddish brown surface growth and the breakdown of protein to amino nitrogen. Although the resulting odour seems offensive to some extent, but the flavour and texture of the cheese are sure to please tastes of many consumers.

Not all cheeses are ripened. Cottage, cream, ricotta, and most mozzarella cheeses are ready for sale as soon as they are made, these cheeses having sweet, delicate flavours and

are often combined with other foods.

1. ultrafiltration-ультрафильтрация
2. enzymatic preparation-зд. ферментативный (энзимный) препарат
3. protein degrading-разрушение белка
4. to clump-собираться в группу
5. fusion-слияние
6. a curing room-зд. помещение для созревания сыров
7. an eye-зд.глазок (у сыра)
8. nutty-пикантный, вкусный
9. blue-veined-зд. голубые прожилки
10. needling-зд. прокалывание
11. to punch-зд. протыкать отверстия
12. wiping-зд. протирание

Text 18
Pasteurized process cheese

Some natural cheese is known to be made into process cheese (especially some defective cheeses), that is a product in which complete ripening is halted by heat. The resulting product is valued due to its indefinite shelf life. Modifying properties (e.g. melting characteristics) of Process cheeses, one can enhance marketability and expand their uses.

Process cheeses are made from hard types of cheese by grinding, heating, mixing and falsifying, the latter process being aided by the addition of not more than 3 percent inorganic salts, usually sodium citrate and sodium phosphate.

Cheddar, Colby called American cheeses are most frequently used in processing. Fresh (young, or green) cheese is usually mixed with aged portions to obtain a desirable blend[1] that particularly affects flavour and aroma. If cheeses are too low in fat, too high in moisture, or with defects in body and texture, such as gas holes, they can be processed as well, provided there are no excessive flavour defects. The blend may consist of either one, two, or more varieties of natural cheese or may contain pimentos[2], fruits, vegetables, or meats.

The cheese is usually labeled “pasteurized” because heat treatment (65 to 71°C) is sufficient to kill pathogens. According to the technological procedure melted cheese initially separates into fat and aqueous (known as serum[3]) phases. Upon introduction of emulsifiers with agitation, a number of chemical processes such as pH increasing, protein solubilization, fat globules formation take place. As a result the mass becomes homogeneous and plastic. Packaged cheese is allowed to slowly cool to room temperature, thus prolonging the lethal effects of heat and acid on microorganisms. Special techonological lines are successfully used for manufacturing of packaged cheese slices which are popular with consumers.

Pasteurized process cheese food is prepared in the same manner as pasteurized

process cheese except that certain dairy products (cream, milk, skim milk, cheese whey, and whey albumin) may be added. A higher temperature of pasteurization (about 77°C) is used in cooking, and acid is added after emulsification to lower the pH to about 5.4. Total fat content is lower (23 percent) and moisture content is higher (44 percent) than in process cheese.

1. a blend-смесь
2. pimento-зд. прянносги, специи
3. serum-сыворотка

Text 19
Cottage cheese

This soft, unripened cheese is made from skim milk (or reconstituted dry skim milk in certain countries, such as Japan), using lactic acid bacteria and a small amount, if any, of rennet. By law, it must contain no more than 80 percent moisture (82,5 percent in lowfat cottage cheese). Creamed cottage cheese must contain at least 4 percent milk fat, whereas the lowfat variety may contain from 0,5 to 1,5 percent fat, dry cottage cheese containing only a trace of fat. The protein of most cottage cheese is nearly all casein, but one company has a patented process whereby skim milk is heated to denature whey proteins which are then partially precipitated with casein. This process is called coprecipitation[1]. In the manufacture of casein from skim milk, it is possible to coprecipitate most whey proteins. About 96 percent of the proteins in milk can be recovered. Combinations of heat and calcium chloride, or of heat and acid are used to induce precipitation.

Flavour, aroma, body, texture, and appearance vary widely among market samples. The most common flavour is acid, but its intensity may vary from mild to sharp. Diacetyl should be detectable by taste and smell, but not so concentrated as to cause a coarse flavour. Body may be either firm or soft; particle size may be small (less than 0,6 cm) or large (1,3 cm); cream may be well absorbed and stabilized or free from curd. Each manufacturer decides which characteristics are most desired by his customers and then tries to" produce that same type of cheese day after day.

Cottage cheese is the most perishable of all common cheeses, for psychotrophic bacteria and yeasts are the usual spoilage agents. However, both low pH (about 5.0) and compounds produced by culture bacteria (especially Leuconostoc) tend to inhibit their growth of harmful bacteria. Practices that are most effective in improving keeping quality are the following: (1) on of contamination from water used in washing the curd and from equipment; (2) early reduction of temperature to about 2°C and maintaining this low temperature.

1. coprecipitation - совместное осаждение

REVISION IV

Answer the questions:

1. Why was butter valued in ancient times?
2. What makes butter perfect food?
3. How is butter manufactured?
4. Why is it necessary to add salt to butter?
5. What does the colour of butter depend on?
6. What are the by-products of butter manufacture?
7. Is butter more popular than margarine?
8. What grades are assigned to butter in the USA?
9. How was cheese made according to an ancient legend?
10. What is known about cheese making in America until the 19th century?
11. Why was it difficult to make the same type of cheese in old times?
12. How many types of cheese are known nowadays?
13. What problems of cheese making are being solved by dairy specialists now?
14. What principle is cheese-making process based upon?
15. What variables can effect the cheese-making process?
16. What are the four basic ingredients for cheese making?
17. How is rennet obtained?
18. What are the eight steps of cheese-making process?
19. Why is the cheese-ripening step known to be the most risky?
20. What are the advantages and disadvantages of milk pasteurization?
21. What does the term “inoculation” mean?
22. How can the curdling process be described?
23. What is the role of lactic acid produced by starter culture organisms?
24. How should cutting and shrinking processes be carried out?
25. What are the sources of enzymes used in cheese ripening?
26. How does the ripening time vary with different kinds of cheese?
27. How can cheeses be classified?
28. What is the raw material for making pasteurized process cheese?
29. What are the main steps of making pasteurized process cheese?
30. What is pasteurized process cheese food made of?
31. What are the main characteristics of cottage cheese?
32. What does coprecipitation process include?

Grammar issues to be revised:

1. Conditional sentences of three types.
2. The emphatic construction “It is ... that (who)”
3. The construction “It is necessary that... ”.
4. Finite and non-finite verb forms.

I. Open the brackets using the verbs in forms of Conditional I.

1. Provided milk (to store) in a canteen made from animal's stomach, the enzyme rennin (to cause) milk coagulation.

2. If producers (to use) immobilized enzyms, they (to accelerate) ripening of cheese.

3. If heat and acid (to use), precipitation of casein (to occur).

4. Unless operations in cheese-making (to automate), it (to be difficult) to avoid accidental changes in cheese quality.

5. If the curd (not to press) adequately, it (to contain) a large amount of water.

6. If producers (to modify) the preparation of process cheeses, they (to increase) marketability and (to expand) uses of these cheeses.

7. If we (to use) the classification of cheeses according to their consistency, such characteristics of cheeses as fat and protein content (not to consider).

8. When Penicillium mold spores (to introduce and activate), a special variety of blue- veined cheeses (to produce).

9. Casein (to coagulate) if pH (to be) high.

10. If butter (to make) of raw cream, lipase (not to destroy and to give) the butter rancid flavour.

II Open the brackets using the verbs in proper forms of Conditionals II and III

1. If we changed temperature and humidity, the cheese (to ripen) under specific conditions.

2. Most natural enzymes of milk would remain active in cheese if the pH (to be) favourable. |

3. Unless temperature were below 15° C, yeasts and molds (to grow) rapidly.

4. If the equipment were washed more carefully, bacteria (not/ to cause) the spoilage of cottage cheese.

5. Packaged cheese would be protected from undesirable effects of heat and harmful microorganisms if it (to cool) slowly to room temperature.

6. If the technologist (not/ to follow) all recommendations, Swiss-type cheeses would not ripen with proper size of eyes.

7. If the farmer (to be) more economical, he would process the whey in any way.

8. The growth of acid-forming bacteria (to inhibit) if antibiotics were added.

9. If man (not to domesticate) mammals, he could not have started making cheese.

10. If the farmer did not sell skim milk and buttermilk obtained in butter making, he (to lose) a major part of his profit.

11. If the cream (to transport) under due conditions, it would not have soured.

12. If the incomes of population had not fallen dramatically in the late 1990s, butter consumption (not to decrease).

III. Complete the sentences.

1. People would not have chosen cheese as the means of exchange if it...

2. If immigrants from Europe had not brought cheese to America, ...

3. Unless there had been a large variety of bacteria and other microorganisms,…..

4. If in old times people had known chemical and biological processes used in

cheese-making, ...

5. New varieties of cheeses would not have appeared, unless ...

6. We would have found where cheese originated from if...

7. Unless it had been hot and there were natural rennin, the Arabian merchant

8. American cheeses would have been processed into pasteurized cheese if they

IV. Group the sentences into those where the emphatic construction "It is ... that (who) ... " is used and those with the construction "It is necessary that ...". There may be sentences not belonging to either group.

1. It is known that lipases and proteases will break down fat and protein if the pH is favourable.

2. It is the coagulability of casein in milk that is especially important in cheese-making process.

3. It is the ripening time that influences flavour and texture of cheeses.

4. It is necessary that low temperature should be maintained in cottage cheese-making process.

5. It was the Romans who brought knowledge of cheese making to England.

6. It has been found that enzymes produced by bacteria influence flavour development during cheese ripening.

7. It is important that salt should be added to the curd at the curlding stage.

8. It is due to specific organisms that Limbuger cheese possesses a red brown surface.

9. It was after the beginning of cream separation that transportation of cream to specialized creameries rather than processing it on the farms started.

10. It is necessary to neutralize sour cream butter by means of adding alkaline substances.

V. Change the sentences so as to use the emphatic construction "It is .. that (who) Make the underlined words its nucleus.

Model: No additives were used in butter due to old taboos. ▸ It was due to old taboos that no additives were used in butter.

1. The first machinery introduced into the dairy industry was powered by dogs

2. About 1875 cream separation was begun on farms.

3. Late in the 19^{th} century and early in the 20^{th}, cream was transported to creameries by haulers travelling along regular routes.

4. Ancient Hindus valued cows according to the amount of butter feat could be churned from their milk.

5. The French chemist Mege Mouries developed the technique of making margarine in 1869.

6. Dairy scientists work at improving spreadability and resistance to oxidation of butter.

VI. Change the following sentences so as to use die construction "It is necessary that... ".

Model: it is desirable for the casein content to be high in milk used for cheese making. It is desirable that the casein content should be high in milk used in cheese making.

1. It is essential to agitate cream strongly in order to cause fat to stick together.
2. It is necessary to add alkaline substances to sour cream in the process of butter making.
3. It is essential for milk used for cheese making to be free of antibiotics and sulfa drugs
4. It is desirable for milk used for the production of most ripened cheeses to be treated with heat as little as possible
5. It is important to determine pH correctly before cutting the curd.
6. It is essential to control moisture, acidity, body, and texture before the cheese is packed
7. It is important for cottage cheese curd not to be allowed to stick together.
8. To obtain desirable elasticity of cheese, it is necessary to control acidity within Harrow limits.
9. It is important to uniformly distribute salt in cheese.
10. It is necessary to press cheese slowly at first.

VII. Open the brackets using verbs in proper forms. Add prepositions where necessary.

1. Nowadays most cheese (to produce) commercially. Mechanized and automated processes (to develop) and (to apply) in large plants.
2. Some cheeses (to make) by (to use) proteins.
3. Casein (can/ to precipitate) by (to lower) the pH to its isoelectric point with acid.
4. Immigrants from Europe (to bring) love for cheese and their knowledge of processes (to need) in order (to make) cheese in America.
5. The details of cutting, stirring, heating, draining, pressing, and salting the curd, and curing the cheese (to vary) in order (to produce) characteristics peculiar to each kind of cheese.
6. The widely (to accept) method of cheese classification (to base) on the consistency of body and the method (to ripen).
7. Hardness in cheese (to control) mainly by moisture content.
8. Moisture (must/ to incorporate) in butter in the highest possible concentrations, but fat (must not/ to be) below 80 percent (to meet) the legal standard.
9. Cream (to separate) from whey often (to add) to other cream or (to chum) in order (to produce) butter.
10. Cultured cream butter (to make) from cream that (to inoculate) with butter culture and (to incubate).
11. Butter (can/ to store) for a long time (to compare) with many other forms of milk fat.
12. Butter (to know) as food, medicine, and cosmetic for at least 5,000 years.
13. It (to believed) that the cow (to domesticate) at about 8,000 BC.

14. Cheese (to play) an important role in the economy of peoples and nations ever since it first (to make).

15. Butter typically (to chum) from cream, although it (may/ to chum) from milk.

16. Accelerated churning (to develop) by Dr. Fritz, the German dairy scientist.

17. The number of microorganizms in sweet butter (to be) low because most of them (to destroy) by pasteurization.

18. In salted butter salt (to dissolve) in the water phase.

19. Moulds (to be) often salt tolerant and (to grow) well on the surfaces of butter.

20. The colour of butter (to show) the concentration of carotene present in the cream from which butter (to make).

Vocabulary

Условные сокращения
a-adjective-имя прилагательное
n-noun-имя существительное
v- verb- глагол
pl-plural-множественное число

A

abundant [ə'bʌndənt] - a обильный, богатый
acid ['æsɪd] - n кислота;fatty ~s жирные кислоты, saturated fatty ~s насыщенные жирные кислоты, saturated fatty ~s ненасыщенные жирные кислоты,amino ~s аминокислоты
acid ['æsɪd] - a кислотный, кислый
additive ['ædɪtɪv] n добавка (пищевая); приправа
adipose ['ædɪpəus] - a жирный, жировой; ~ tissue жировая ткань
adult ['ædʌlt] -a взрослый
age [eɪdʒ] - v выдерживать, вызревать
ageing ['eɪdʒɪŋ] - n выдержка, выдерживание, созревание (сыра, мяса)
agitation [ˌædʒɪ'teɪʃən] - n перемешивание, встряхивание
aid [eɪd] - v помогать
ash [æʃ] - n зола, пепел
assimilate [ə'sɪmɪleɪt]-v поглощать, усваивать
assist [ə'sɪst] - v помогать, содействовать

B

beef [bi:f] -n говядина
belly ['belɪ] - n живот, брюшко
Beverage ['bevərɪdʒ] -n питье, напиток
bind[barnd] v (bound)-связывать
black pudding ['blæk'pʊdɪŋ] -черный пудинг,кровяная колбаса
bleed [bliːd] -v пускать кровь,обескровливать животное/птицу
body ['bɔdɪ] -n тело (о животном),консистенция (о мороженом)
bone [bəʊn] – v снимать мясо с костей
braise [breɪz] -v тушить мясо,предварительно его обжарив
buffalo ['bʌfələʊ] -n (pl buffaloes) буйвол
bulky ['bʌlkɪ] -a большой,объемистый
butchering['bʊʧərɪŋ] –n забой скота,свежевание,разделка туши
buttermilk ['bʌtəmɪlk] -n пахта

C

calf [kɑːf] -n (pl calves) теленок (в возрасте до года)
can [kæn] -v консервировать
canner ['kænə] -n крупный рогатый скот низкой кондиции,используемый для производства консервов
carbohydrate ['kɑːbəʊ'haɪdreɪt] -n углевод

carcass ['kɑ:kəs] -n туша
cell [sel] -n (биол.) клетка
chitterlings ['tʃɪtəlɪŋz] -n pl свиные рубцы
choice [ʧɔɪs] -a отборный,лучший (сорт)
cholesterol [kə'lestərəl] -n холестерин
chop [ʧɔp] -n отрубленный кусок,отбивная котлета
churning ['ʧɜ:nɪŋ] -n сбивание,пахтанье (масла)
clump [klʌmp] -v собирать(ся) в группу
coagulability [kəʊægjʊlə'bɪlɪtɪ] -n свертываемость
coagulate [kəʊ'ægjʊleɪt] -v коагулировать,сгущать(ся),свертывать(ся)
coagulum [kəʊ'ægjʊləm] -n коагулят,сгусток
commercial [kə'mɜ:ʃəl] -a товарный,рыночный (сорт)
compound ['kɔmpaʊnd] -n сондинение,смесь,состав
condiment ['kəndɪmənt] -n приправа
conformation [kɔnfɔ:'meɪʃn] -n форма,экстерьер
consistency [kən'sɪstənsɪ] -n консистенция,структура,густота,плотность
constituent [kən'stɪtjʊənt] -n составная часть,элемент
contamination [kəntæmɪ'neɪʃn] -n загрязнение,порча,заражение,разложение
corned [kɔ:n] -a соленый,beff солонина
cottage cheese ['kɔtɪʤ ʧi:z] -n домашний сыр,творог
counterpart ['kaʊntəpɑ:t] -n аналог,эквивалент
cream [kri:m] –n сливки,крем,sour-сметана,coffee- сливки для кофе
cream cheese ['kri:m'ʧi:z] –n сливочный сыр
creamery ['kri:mərɪ] -n маслобойка,маслозавод,сыроварня
creamy ['kri:mɪ] -a сливочный,жирный,кремовый
cross-section [krɔs-sekʃn] -n поперечный разрез
cuisine [kwi:'zi:n] -n кухня,кулинарное искусство
cull [kʌl] -a бракованный
culture ['kʌlʧə] -n культура бактерий
cultured ['kʌlʧəd] -a кисломолочный(продукт)
curd [kɜ:d] -n сгусток,pl свернувшееся молоко, творог,test- проба на заквашивание, сычужная закваска
curdle [kɜ:dl] -v свертывать(ся),сгущать(ся) (о молоке)
cure [kjʊə] -v консервировать, солить
custard ['kʌstəd] -n жидкий, заварной крем (из молока)
cut ['kʌt] -т мясной отруб, отрезанный кусок, вырезка
cutter ['kʌtə] -n говяжья туша колбасной категории

D

dairy ['dɛərɪ] -a молочный,n завод
decay [dɪ'keɪ] -n гниение, разложение
dehydrated [di:'haɪdreɪtɪd] -a обезвоженный,milk сухое молоко
deposit [dɪ'pɔzɪt] -n отложение, запас; v отлагаться, осаждаться
diet ['daɪət] - n питание; пища; еда

digest ['daɪʤest] - v переваривать (пищу); усваивать(ся)
digestive [dɪ'ʤestɪv] -a пищеварительный, способствующий пищеварению; — tract пищеварительный тракт
digestion [dɪ'ʤestʃən] -n пищеварение
dilute [daɪ'ljuːt] - v разбавлять, разводить
dip [dɪp] - n подливка, соус; погружение; окунание; макание; v окунать, макать
dispersed [dɪs'pɜːs] -a диспергированный (о веществе)
dormant ['dɔːmənt] -a бездействующий, находящийся в покое
double- [dʌbl] v удваивать; увеличить вдвое
dressing ['dresɪŋ] -n приправа, соус; гарнир

E

edible ['edɪbl] -a съедобный
enhance [ɪn'hɑːns] -v увеличивать, усиливать
eviscerate [ɪ'vɪsəreɪt] -v потрошить
expose [eks'pəʊzeɪ] -v подвергать воздействию
extend [ɪks'tend] -v расширять; продолжать; удлинять (срок)

F

fibre ['faɪbə] -n волокно
fine-grained ['faɪnər-greɪnd] -a мелкозернистый
firm [fɜːm] -a твердый, крепкий, плотный; устойчивый
firmness ['fɜːmnəs] -n твердость, крепость, прочность, устойчивость
flavour ['fleɪvə] -n аромат, привкус; запах; tart - терпкий/ кислый привкус
flesh [fleʃ] -n сырое мясо
fortification fɔːtɪfɪ'keɪʃn] -n обогащение, повышение питательности, витаминизация
fortify ['fɔːtɪfaɪ] -v обогащать, повышать питательную ценность; витаминизировать (пищевые продукты)
freeze [friːz] (froze, frozen)-v замораживать
freezing ['friːzɪŋ] -n замораживание
fry [fraɪ] -v жарить(ся)

G

game [geɪm] -n дичь
garnish ['gɑːnɪʃ] -n гарнир
grading ['greɪdɪŋ] -n классификация, сортировка
grind [graɪnd] (ground, ground)-v молоть,размалывать,перемалывать, толочь, растирать
grinding ['graɪndɪŋ] –n измельчение, помол; растирание
ground [graʊnd] -a молотый, измельченный; ~ meat -мясной фарш

H

half-and-half ['hɑːfənd'hɑːf] –n смесь двух веществ в равных частях
halt [hɔːlt] -v останавливать, прекращать
ham [hæm] –n бедро, ляжка
harden [hɑːdn] -v становиться жестким
hardness ['hɑːdnɪs] -n твердость, жесткость

harmful ['hɑ:mfʊl] -a вредный, опасный
harmless ['hɑ:mlɪs] -a безвредный, безопасный
harsh [hɑ:ʃ] -a жесткий; грубый (на ощупь); резкий, неприятный (на вкус), ~ flavour резкий привкус (запах); -to the taste острый, терпкий на вкус
harshness ['hɑ:ʃnɪs] -n резкость, жесткость, шероховатость
hide [haɪd] –n шкура, кожа

I

indigestible [ɪndɪ'ʤestəbl] -a неудобоваримый, трудно перевариваемый
incubation [ɪnkjʊ'beɪʃn] –n культивирование; выращивание (микроорганизмов)
infant ['ɪnfənt] -n младенец, ребенок
inhibit [ɪn'hɪbɪt] -v подавлять, сдерживать; тормозить; задерживать; запрещать
inoculation [ɪnɔkjʊ'leɪʃn] -n инокуляция, посев, внесение посевного материала
inoculum [ɪ'nɔkjʊləm] -n посевной материал/ культура
intestinal [ɪn'testɪnl] -a кишечный
intestine [ɪn'testɪn] -n pl кишечник
intolerance [ɪn'tɔlərəns] -n чувствительность (к лекарству); аллергия; нетерпимость
irradiate [ɪ'reɪdɪeɪt] -v облучать
irradiation [ɪreɪdɪ'eɪʃn] -n облучение; иррадиация; излучение

J

jerky ['ʤɜ:ki] -n вяленое мясо
juice [ʤu:s]-n сок
juiciness ['ʤu:sɪnəs]-n сочность

K

kidney ['kɪdnɪ] -n (анат)почка
koumiss ['ku:mɪs] -n кумыс

L

lamb [læm] -n мясо молодого барашка, ягненок,baby- ягненок-молочник, поярок,spring-ягненок весеннего скота
lard [lɑ:d] -n топленый свиной жир
lean [li:n] -n постное мясо,постная часть мясной туши,а нежирный,постный
leanness ['li:nɪs] -n худоба,истощение
ligament ['lɪgəmənt] -n связка (в анатомии)
lights [laɪts] -n pl легкие (бараньи, свиные и т.п употребляемые в пищу)
liver ['lɪvə] -n(анат.)печень
loin [lɔɪn] -n филейная часть-chop порционный кусок мяса
luncheon ['lʌnʧən] meat-мясной рулет,"мясо для завтрака"
lung [lʌŋ] -n (анат.) легкое

M

mammal ['mæməl] –n млекопитающее; pl mammalia - млекопитающие mammalian [mə'mɑ:lɪən] -a относящийся к млекопитающим
mammary ['mæmərɪ] -a грудной, молочный; -gland молочная железа
manufacture [mænjʊ'fækʧə] –n производство; процесс изготовления

marbled [mɑːbl] -a крапчатый, под мрамор
marbling ['mɑːblɪŋ] -фактура с прожилками
meltdown ['meltdaʊn] – n растгаавление; оттаивание (о мороженом)
mesentery ['mesəntərɪ] -n брыжейка, мышечная перегородка
milk [mɪlk] -n молоко; churn ~ пахта; condensed- сгущенное молоко; dried ~ сухое молоко; evaporated ~ сгущенное молоко без сахара, ice - молочное мороженое; skim- снятое молоко; whole ~ цельное молоко
mix [mɪks] –n смесь; состав; пищевой полуфабрикат
mould [məʊld] –n плесень
muscle [mʌsl] -n мускул, мышца
mycelium [maɪ'siːlɪəm] -n мицелий, грибница
myofibril-n миофибрилла; мышечное волокно

N

nonruminant –n pl животные с однокамерным желудком;
нежвачные животные
nutrient ['njuːtrɪənt] –n питательное вещество; ~ value питательность; a питательный
nutrition –n питание; пища
nutritional [njuː'trɪʃənl] -a пищевой, питательный
nutritive ['njuːtrɪtɪv] -n пищевой продукт; пища; a питательный; пищевой; - valuen питательное значение; питательная ценность

O

odour ['əʊdə] –n запах, аромат
offal ['ɔfəl] –n требуха, потроха
overrun [əʊvə'rʌn] -n избыток

P

packaging ['pækɪʤɪŋ] –n упаковка, способ упаковки
pasteurization ['pæstəraɪ'zeɪʃən] -n пастеризация
pasteurize ['pæstəraɪz] -v пастеризовать
patty ['pætɪ] -n котлета
perishable ['perɪʃəbl] -a скоропортящийся (продукт)
picnic ['pɪknɪk] -a лопаточная часть туши
plain [pleɪn] -a простой, обыкновенный, несмешанный, без добавок
pork [pɔːk] -n свинина
precipitate [prɪ'sɪpɪtɪt] -n осадок
precipitate [prɪ'sɪpɪtɪt] -v осаждаться)
present [preznt] -v обнаруживать, показывать
preservation [prezɜː'veɪʃn -n сохранение, консервирование; сохранность
preservative [prɪ'zɜːvətɪv] -n консервант, консервирующее вещество
prime [praɪm] -a превосходный, лучший (сорт)
process ['prəʊses] -n процесс, прием, способ; v перерабатывать
process cheese ['prəʊsest'ʧiːz] -n плавленый сыр
processing ['prəʊsesɪŋ] -n обработка, переработка (сырья)
pump [pʌmp] -v качать (насосом)

pure [pjʊə] -a чистый, без примесей

R

rancid ['rænsɪd] -a прогорклый
rancidity [ræn'sɪdɪtɪ] -n прогорклость, прогорклый запах/ вкус
refrigerating [rɪ'frɪʤəreɪtɪŋ] -a охлаждающий, холодильный
reindeer ['reɪndɪə] –n северный олень
release [rɪ'liːs] -v освобождать, выпускать
remove [rɪ'muːv] -v уносить, удалять
rennet ['renɪt] -n сычуг
rennin ['renɪn] -n сычужный фермент
retard [rɪ'tɑːd] -v замедлять, задерживать
rib [rɪb] -n ребро; spare ~s свиные ребрышки
ripen ['raɪpən] -v поспевать, зреть; созревать; выдерживать (сыр)
ripening ['raɪpənɪŋ] –n созревание
roast [rəʊst] -a жареный; v жарить, запекать
ruminant ['ruːmɪnənt] –n жвачное животное; a жвачный
rump [rʌmp] –n огузок
rupture ['rʌpʧə] -v разрывать(ся); прекращать

S

saliva [sə'laɪvə] –n слюна
sauce [sɔːs] -n соус
sausage ['sɔsɪʤ] –n колбаса, сосиска
season [siːzn] -v приправлять блюда (пищу)
semisoft ['slɔːtə] -a полумягкий
serum ['sɪərəm] –сыворотка
shellfish ['ʃelfɪʃ] –n моллюск
sherbet ['ʃɜːbət] -n шербет (восточный напиток); фруктовое мороженое; замороженный десерт с фруктами иди орехами
shred [ʃred] -v (shred) резать на кусочки
shrink [ʃrɪŋk] (shrank, shrunk) -v сокращаться; уменьшаться, усыхать
shrinkage ['ʃrɪŋkɪʤ] –n сжатие; сокращение; уменьшение; усушка
skim milk [skɪm mɪlk] -n снятое молоко; ~ cheese обезжиренный творог
skin [skɪn] -n кожа, шкура, v сдирать кожу, шкуру
slaughter ['slɔːtə] -n убой (скота); v забивать, резать (скот)
slice [slaɪs] -n ломтик
smoke [sməʊk] - v коптить
smooth [smuːð] -a однородный
solid ['sɔlɪd] -n pl сухой остаток, сухие вещества
solidify [sə'lɪdɪfaɪ] -v затвердеть, отвердеть, загустевать
soluble ['sɔljʊbl] -a растворимый; fat ~ жирорастворимый; water ~ водорастворимый
sour-a кислый; ~ cream сметана; - clotted milk простокваша
spareribs-n pl свиные ребрышки
spinal [spaɪnl] -a спинной, позвоночный; ~ marrow спинной мозг

spoilage ['spɔɪlɪʤ] -n порча
spreadability [spredə'bɪlɪtɪ] -n консистенция
starter ['stɑːtə] -n закваска
steak [steɪk] -n кусок мяса(для жарки); бифштекс
stomach ['stʌmək] -желудок, живот; multichambered ~ многокамерный желудок
storage ['stɔːrɪʤ] -n хранение, хранилище, ~ life срок хранения
store [stɔː] -v хранить, сохранять; запасать, накапливать
stuff [stʌf] -v начинять, фаршировать
stun [stʌn] -v оглушать(скот перед убоем)
sweetbread ['swiːtbrɛd] –n "сладкое мясо"(зобная и поджелудочная железы)
sweeter [swiːt] -n подслащивающее вещество

T

tenderness ['tendənɪs] -n нежность, мягкость
tendon ['tendən] -n сухожилие
texture ['tekstʧə] -n строение ткани; степень плотности ткани; текстура; структура
thaw [θɔː] -v таять, оттаивать, размораживать(ся)
tissue ['tɪʃuː] -n(биол.) ткань
trace [treɪs] -n след, незначительное количество
trap [træp] -v поглощать, улавливать, задерживать
tripe [traɪp] -n рубец(часть желудка жвачного животного, обычно как блюдо),требуха(кишки и т.п)
trotter ['trɔtə] -n pl ножки(свиные и т.п. как блюдо)

U

urban ['ɜːbən] -a городской
utility [juː'tɪlɪtɪ] -n общепользовательной категории(о животном), невысокого качества(о сорте); ~ beef говядина низшего сорта

V

valve [vælv] –n клапан, вентиль, задвижка
variety [və'raɪətɪ] -n разновидность; meat ~s мясные субпродукты(язык, печень)
vat [væt] -n чан, бак, цистерна
veal [viːl] -n телятина
velvety ['velvɪtɪ] -a бархатный, бархатистый
viscosity [vɪs'kɔsɪtɪ] -n вязкость

W

water-ice ['wɔːtəraɪs] -n шербет, фруктовое мороженое на воде whey-n сыворотка
whip [wɪp] -v сбивать
whole [həʊl] -a цельный; ~ milk цельное молоко
wholesale ['həʊlseɪl] -a оптовый

Y

yearling ['jɜːlɪŋ] -n первогодок, годовалое животное; a годовалый
yeast [jiːst] -n закваска, дрожжи
yogurt ['jɔgɜːt] -n йогурт, простокваша

Conclusion
(Заключение)

Настоящее пособие имеет целевой характер и раскрывает сущность дидактической эффективности всех его учебных материалов.

Функциональность и содержательность учебных текстов последовательно ведет обучаемого от полностью понятного простого к столь же понятному сложному.

Грамматический материал, представленный в этом пособии, подразумевает овладение студентами основами грамматики английского языка и закрепляет такие разделы как: видовременные формы глаголов, страдательный залог, простые и сложные формы инфинитива и конструкции с ними, условные предложения, модальные глаголы.

У студентов появляется возможность повторить и закрепить материал в конце курса обучения английскому языку.

Предлагаемое разнообразие текстов, содержащих не только описание основных процессов, связанных с производством молочных продуктов, но и интересные факты об истории происхождения этих продуктов и их питательной ценности, максимально приближает учебный процесс к реальной действительности, повышает интерес студентов к учебе, активизирует стремление к глубокому овладению теоретическими знаниями.

Учебные материалы пособия не подменяют, а дополняют работу обучаемых с базовыми учебниками и оригинальными техническими текстами по специальности.

Содержание пособия направлено на повышение эффективности профессионально-ориентированного изучения иностранного языка и на дальнейшее совершенствование приобретенных знаний в высших и средних сельскохозяйственных учебных заведениях.

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