МИНИСТЕРСТВО СЕЛЬСКОГО ХОЗЯЙСТВА
И ПРОДОВОЛЬСТВИЯ РЕСПУБЛИКИ БЕЛАРУСЬ

ГЛАВНОЕ УПРАВЛЕНИЕ ОБРАЗОВАНИЯ, НАУКИ И КАДРОВ

Учреждение образования
«БЕЛОРУССКАЯ ГОСУДАРСТВЕННАЯ
СЕЛЬСКОХОЗЯЙСТВЕННАЯ АКАДЕМИЯ»

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АНГЛИЙСКИЙ ЯЗЫК

AQUACULTURE

Рекомендовано учебно-методическим объединением по образованию в области сельского хозяйства в качестве учебно-методического пособия для студентов учреждений высшего образования, обучающихся по специальности 1-74 03 03 Промышленное рыбоводство

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Данное учебное пособие содержит тексты и задания, целью которых является изучение специальной терминологии по аквакультуре, расширение лексического запаса в академической и научной сфере, формирование и совершенствование навыков чтения и перевода профессионально-ориентированных текстов. Учебное пособие также содержит курс повторения грамматики английского языка. В раздел для дополнительного чтения вошли актуальные профессионально-ориентированные тексты, содержащие информацию по проблемам аквакультуры.

Для студентов учреждений высшего образования, обучающихся по специальности 1-74 03 03 Промышленное рыбоводство.

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ВВЕДЕНИЕ

Настоящее пособие предназначено для студентов 1-го курса факультета биотехнологии и аквакультуры, обучающихся по специальности 1-74 03 03 Промышленное рыбоводство.

Пособие подготовлено на материале текстов по аквакультуре и имеет своей целью формирование навыков и умений чтения текстов по специальности.

Пособие состоит из нескольких частей. Первая часть разбита на 10 уроков, имеющих однотипную структуру. Упражнения в каждом уроке построены на основе лексического и грамматического материала данного урока, отличаются достаточным разнообразием, последовательность разделов во всех уроках одинаковая, что систематизирует работу с пособием.

В разделе «Reading» предлагается для прочтения текст профессиональной тематики. Перед текстом приводится список новых слов и упражнения на снятие лексических трудностей чтения. Послетекстовые задания включают упражнения на проверку понимания прочитанного и активизацию лексики урока. В раздел «Vocabulary Building» вынесены для активного усвоения слова не только профессионального, но и общенаучного характера, которые встречаются в рамках урока. В разделе «Word Formation» студенты знакомятся с некоторыми самыми употребительными словообразовательными моделями. Последний раздел урока – «Grammar Revision» – дает возможность студентам повторить и закрепить наиболее важные грамматические явления.

В той части пособия, которая называется «Reading Bank», приводятся тексты для дополнительного чтения, причем тематически они подобраны так, чтобы соответствовать тематике текстов в основной части пособия.

Кроме поурочных списков слов, в пособии приводится общий перечень терминологической и общенаучной лексики, расположенной в алфавитном порядке, а также таблица неправильных глаголов.

Разработанные задания могут использоваться как на занятиях с преподавателем, так и для самостоятельной работы.

UNIT 1

WHAT IS AQUACULTURE?

I. Words to know before you read

Task 1. Practise reading the following words.

algae [ˊældʒi:] – водоросли
aquarium [əˊkwe(ə)riəm] – аквариум
biotechnology [ˌbaiəʊtekˊnɒlədʒi] – биотехнология
crustaceans [krʌˊsteiʃnz] – ракообразные
environment [inˊvai(ə)rənmənt] – окружающая среда
hatchery [ˊhætʃ(ə)ri] – рыбий инкубатор, рыбоводный завод
mollusk [ˊmɒləsk] – моллюск
nutritional [nju:ˊtriʃ(ə)nəl] – питательный
pharmaceutical [ˌfa:məˊsjutikəl] – фармацевтический
salmon [ˊsæmən] – лосось
shellfish – водные животные, имеющие панцирь, моллюски
species [ˊspi:ʃi:z] – (*биол.*) вид
stock – запас (рыб)
vegetable [ˊveʤ(i)təbl] – овощ
water column [ˊkɒləm] – водная толща

Task 2. Match the English and Russian equivalents.

1) fish farming	a) рыба, выращенная заводским способом
2) shellfish farming	b) разведение моллюсков
3) water environment	c) товарный размер
4) plant species	d) виды растений
5) freshwater species of fish	e) водная среда
6) fish eggs	f) восстановление запасов рыбы
7) hatchery fish	g) икра
8) market size	h) пресноводные виды рыб
9) stock restoration	i) рыбоводство

Task 3. Match the Russian and English equivalents

1) водоем	a) ornamental fish
2) аквакультура в морских водах	b) wild populations
3) популяции в дикой природе	c) pharmaceutical products
4) установка замкнутого водоснабжения (УЗВ)	d) marine aquaculture
	e) manmade system

5) фармацевтические препараты	f) recirculating aquaculture system
6) декоративная рыба	g) water body
7) устричный риф	h) biotechnology products
8) биотехнологическая продукция	i) oyster reef
9) искусственная система	

II. Reading

Task 4. Read the text and find answers to the following questions:

1. What does aquaculture refer to[1]?
2. What does aquaculture produce?
3. What is stock restoration?
4. What is the difference between marine and freshwater aquaculture?

Aquaculture – also known as fish or shellfish farming – refers to the breeding, rearing, and harvesting of plants and animals in all types of water environments including ponds, rivers, lakes, and the ocean. Researchers and aquaculture producers are "farming" all kinds of freshwater and marine species of fish, shellfish, and plants. Aquaculture produces food fish, sport fish, bait fish, ornamental fish, crustaceans, mollusks, algae, sea vegetables, and fish eggs.

Aquaculture includes the production of seafood from hatchery fish and shellfish which are grown to market size in ponds, tanks, cages, or raceways. Stock restoration or "enhancement" is a form of aquaculture in which hatchery fish and shellfish are released into the wild to rebuild wild populations or coastal habitats such as oyster reefs. Aquaculture also includes the production of ornamental fish for the aquarium trade, and growing plant species used in a range of food, pharmaceutical, nutritional, and biotechnology products.

Marine aquaculture refers to[1] the culturing[2] of species that live in the ocean. U.S. marine aquaculture primarily produces oysters, clams[3], mussels[4], shrimp[5], and salmon as well as lesser amounts of cod[6], yellowtail[7], barramundi, sea bass[8], and sea bream[9]. Marine aquaculture can take place in the ocean (that is, in cages, on the seafloor, or suspended in the water column) or in on-land, manmade systems such as ponds or tanks. Recirculating aquaculture systems that reduce[10], reuse[11], and recycle[12] water and waste[13] can support some marine species.

Freshwater aquaculture produces species that are native to[14] rivers, lakes, and streams. U.S. freshwater aquaculture is dominated by catfish[15] but also produces trout, tilapia, and bass. Freshwater aquaculture takes place primarily in ponds and in on-land, manmade systems such as recirculating aquaculture systems.

Notes

[1] refer to – относиться к, (*зд.*) значить
[2] to culture – выращивать
[3] clam – морской моллюск
[4] mussel – мидия
[5] shrimp – креветка
[6] cod – треска
[7] yellowtail – желтохвост
[8] sea bass – окунь морской
[9] sea bream – морской лещ
[10] reduce – уменьшать
[11] reuse – повторно применять
[12] recycle [ri:ˊsaik(ə)l] – перерабатывать
[13] waste – отходы
[14] native to – присущий, обитающий в
[15] catfish – сом

III. Comprehension check

Task 5. Match the beginning and the end of the sentences below.

1) Aquaculture is the breeding	a) as ponds, lakes, marshland or brackish water and the ocean.
2) Aquaculture can take place in natural water bodies such	b) oysters, salmon, trout, clams and other shellfish.
3) Typical species that are found in aquacultural systems include	c) and harvesting of plants and animals in water.

IV. Vocabulary building

Task 6. Find in the text the English equivalents for the following words and expressions:

1) разведение; 2) выращивание; 3) вылов, уборка; 4) пруд; 5) озеро; 6) исследователи; 7) промысловая (съедобная) рыба; 8) рыба для спортивного рыболовства; 9) живец; 10) садок (для рыб); 11) искусственный водоем, цистерна; 12) проточный канал (для разведения рыбы); 13) восстановление промысловых запасов рыбы; 14) восстановить популяции в дикой природе; 15) выпускать на волю (в дикую природу); 16) прибрежная среда обитания; 17) во взвешенном состоянии в толще воды.

Task 7. Learn the following words and expressions. Translate the sentences paying attention to the underlined words.

including – включая also – также; as well as – а также primarily [ˊpraim(ə)rəli] – главным образом such as – такой, как; такие, как that is – то есть

1. Aquaculture can take place in natural water bodies including rivers, lakes and ponds. 2. Aquaculture can help rebuild wild stock populations or coastal habitats such as oyster reefs. 3. US marine aquaculture primarily produces oysters, clams, mussels, shrimp and salmon. 4. Marine aquaculture can take place in the ocean (that is, in cages, on the seafloor, or suspended in the water column). 5. Aquaculture provides fish, shellfish as well as marine plants for human consumption or recreation. 6. Aquaculture also includes the production of ornamental fish for the aquarium trade

Task 8. Complete the sentences with the words from the box.

• harvesting • wild stock populations • 'fish farming' • to reduce *• aquaculture species • ponds • aquaculture products •*

1. The term _____ is often used synonymously with aquaculture.
2. Aquaculture is the science, art, or practice of cultivating and _____ aquatic organisms.
3. The simplest system for raising fish is in _____or irrigation ditches.
4. Aquaculture has the potential _____ the nation's dependence on imports.
5. Right now, the United States is a major consumer of _____.
6. Popular types of _____ include oysters, salmon, trout, catfish, tilapia, mussels, shrimp, clams and prawns.
7. Aquaculture is used to rebuild _____ .

WORD FORMATION

Обратите внимание на приставку **re- ,** которая означает '*снова, еще раз, повторно*':

reuse – снова (многократно) использовать;

recycle – повторно использовать, подвергать вторичной обработке, возвращать в оборот (отходы производства).

Task 9. Make new verbs with the help of prefix *re-* , translate them into Russian.

A) to make, to read, to tell, to write, to elect, to construct, to activate, to place, to produce, to move

B) **Use the right form of the proper verb from A to complete the sentences.**

1) The task ahead is to _____ the building. 2) Town residents are required to _____ cans and bottles. 3) Salmon return to the stream to _____ offspring. 4) The movie _____ the story of Romeo and Juliet. 5) She was named to _____ him as the company's vice president. 6) The teacher asked him to _____ the essay. 7) We had to _____ the bed downstairs. 8) Then I came home, and I _____ some of her poems.

V. Grammar revision

Be

ready for the exam. 8. The keys ___ in the car. 9. It ___ fun. 10. The house ___old and decrepit.

Task 12. Rewrite the following sentences using the correct form of the verb *to be*. Use the information in parentheses at the end of each sentence to help you determine the correct tense and to know whether the sentence is affirmative (+) or negative (–)

1. My daughter (to be) afraid of the dark. (*Present Tense,* +)
2. (To be) Jason right? (*Present Tense,* +)
3. She (to be) hungry for breakfast this morning. (*Past Tense,* –)
4. Please open the windows. I (to be) very hot. (*Present. Tense,* +)
5. I (to be) ashamed of the size of my shoes. (*Present Tense,* –)
6. Cathy (to be) thirty years old on her last birthday. (*Past Tense,* +)
7. We (to be) very thirsty after the race. (*Past Tense,* +)
8. You (to be) wrong again. (*Present Tense,* +)
9. I (to be) right all the time. (*Present Tense,* –)
10. (To be) you scared of thunder? (*Present Tense,* +)
11. He (to be) afraid of the lightning. (*Past Tense,* –)
12. I (to be) cold this morning. (*Past Tense,* +)
13. (To be) the guests hungry? (*Present Tense,* +)
14. My mother and father (to be) happy together. (*Past Tense,* +)
15. (To be) your son scared of spiders? (*Present Tense,* +)
16. I (to be) eighteen years old. (*Present Tense,* –)

Task 13. Fill in the gaps with the Present or Past Simple form of the verb *to be* (affirmative or negative).

Lily (1) ___ my best friend. She (2) ___ brilliant and very beautiful. We (3) ___ very close. Lily (4) ___ single. She (5) ___ interested in marriage. Her career (6) ___ the most important thing for her. Now she (7) ___ the only black editor (издатель) of a popular magazine, but she had a very hard start in life. I remember the day she came to school. One morning the headmistress (директор школы) was standing in the main hall and next to her (8) ___ a new girl, thin and poorly dressed. "Girls", said the headmistress, "this (9) ___ Lily Jago. Now we must be very kind to Lily, because she (10) ___ very poor", she went on. Of course, the headmistress (11) .___ very kind. Lily (12) ___ very angry and unhappy. Lily (13) ____ black, and of course the girls (14)

____kind to her at all. They called her “Lily White”. And when they realized how clever she (15) ____, they hated her for that as well.

I liked her because I (16) ____. an outsider too. My name (17) ___ Faith and the girls nicknamed me “Faith Value” (эталон доверчивости), because they said I (18) ____ naïve. But I (19) ____naïve, I (20) ___. trusting. I always trust in things. I (21) ___. a natural optimist.

There is / there are

Study the examples in the chart.

	Affirmative (+)	**Negative (–)**	**Questions (?)**
Singular	**There’s** a kitchen.	**There isn’t** a living room.	**Is there** a table? Yes, **there is.** No, **there isn’t**.
Plural	**There are** two bedrooms.	**There aren’t** any bedrooms.	**Are there** any beds? Yes, **there are**. No, **there aren’t**.

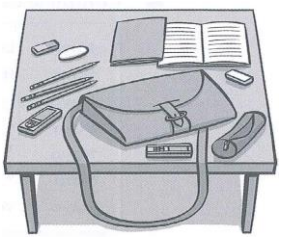
Look at the picture. Complete the sentences with *there’s / there are* or *there isn’t / there aren’t*. Choose the correct preposition.

1._____ a desk **on / in** the room.
2._____ any pens **on / above** the desk.
3._____ some books **in / under** the bed.
4._____ a sofa in the room.
5._____ some CDs **next to / on** the bed.
6._____ a computer **on / under** the desk.
7._____a blue chair **next to / under** the desk.

Task 14. Write sentences about the picture. Use *there’s / there are* and the words in the box.

a pencil case a bag three erasers three pencils
two mobile phones two notebooks

1. *There’s a pencil case on the table.*
2. _____
3. _____
4._____
5. _____
6. _____



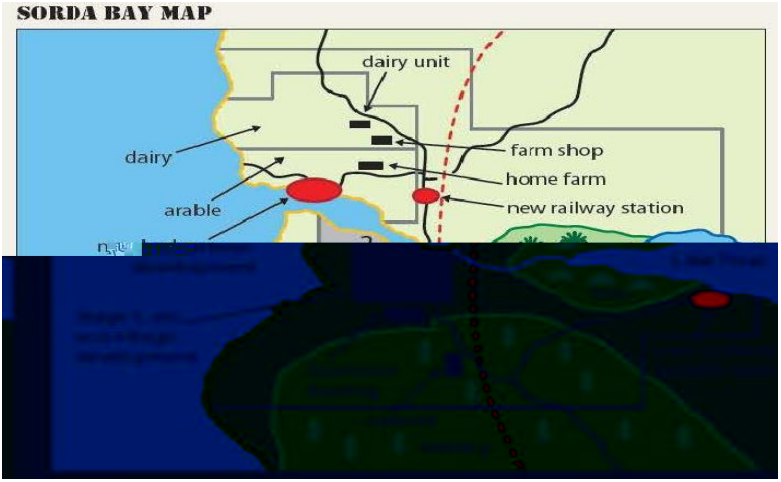
Task 15. Write questions and answers about the picture.

1. there / pencil case / on the desk? – *Is there a pencil case on the desk? Yes, there is.*
2. there / an eraser / next to the bag?
3. there / notebook / under the desk?
4. there / sweater / on the desk?
5. there / a ruler / on the desk?
6. there / bag / on the desk?

What is there in Sorda Bay area?

Task 16. Learn the words below and study the map which shows Sorda Bay and various business types and developments in the area.

bay – бухта, залив
harbor – гавань, порт
dairy – молочная ферма
dairy unit – молочный комплекс
arable – пахотная земля
eco-village development – строительство экологического поселения
SSSI (Site of Special Scientific Unit) – участок особого научного значения
sawmill – лесопильный завод
forestry – лесное хозяйство
railway station – железнодорожный вокзал
outdoor activity centre – центр активного отдыха
brownfield site – проектная площадка на освоенной территории
football pitch – футбольное поле



Look at Sorda Bay map again. Put in *there's, there isn't, there are, there aren't, is there* or *are there*.

What [1]_____ in Sorda Bay area? In Sorda Bay area [2] _____ a traditional mixed farm Sorda Estates. [3] _____ any fish farms? No, but [4] _____ a dairy unit which produces dairy products . Not far from the dairy unit [5] _____ a farm shop but [6] _____ any sports shops or book shops there. In the arable part of Sorda Estates [7] _____ a home farm. However, [8] _____ a grain elevator there. [9] _____ an eco-village development on the brownfield site and a new outdoor centre on the shores of Lake Ferrac. However, [10] _____ no cinemas next to it. [11] _____ a football pitch by the lake? No, but [12] _____ an SSSI which is of great importance for the area. [13] _____ any plants? Yes, [14] _____ a sawmill in the forestry sector.

Task 17. Read the text and find sentences with *there is* / *there are.* Translate them into Russian.

Fish Farm

A fish farm is a place where fish are bred. In most cases, this is done for food. There are two basic types of fish farms: 1) those where the fish are raised in tanks; 2) those where fish are raised in specially prepared areas of the oceans, lakes or rivers.

The most common fish species raised by fish farms are salmon, carp, tilapia, catfish and cod.

There are many problems related to fish farming:

• Sometimes fish can escape. This is only an economic impact if the fish also occur naturally, but can have a big impact if they do not.

• The fish in the farms need to be fed, for this other (smaller) fish need to be raised.

• Diseases and parasites may be a problem, because they spread much easier.

• Fish farms have a bad effect on the surrounding habitat.

Learn some fish idioms!

* **cold fish** (*n.*), (*informal*) – необщительный человек, бесчувственный, неприветливый, бука

Translate these sentences.

No one knows the new doctor, he is a cold fish.
Nobody invites Eric to parties because he is a cold fish.

UNIT 2

FROM THE HISTORY OF AQUACULTURE

I. Words to know before you read

BOD (Biological Oxygen Demand) – биологическая потребность в кислороде, биохимическое потребление кислорода
brackish groundwater – солоноватая подземная вода
compatible organisms – совместимые организмы
compete – конкурировать
complement each other – дополнять друг друга
decomposer – биоредуктор, редуцент; организм, разлагающий органические вещества
detritivore – илоед, детритофаг; организм, питающийся детритом
dispose of – избавиться от (чего)
enclosed system – замкнутая система
feed (fed, fed) on (*v*) – питаться (чем); feed (*n*) – корм
feeding niche [niʧ] – пищевая ниша
fertilise – удобрять, вносить удобрения
fish-catch – улов рыбы
grazer – организм, потребляющий растительную пищу
habitat – среда обитания
inshore – прибрежный, находящийся на берегу
invertebrate feeder – организм, питающийся беспозвоночными
level – уровень
manage – (зд.) справиться с (чем), одолеть
mullet [ˊmʌlit] – кефаль
nutrient – питательное вещество
offshore – в направлении от берега к морю, в открытом море
paddy field –затопляемое рисовое поле (*also*: rice paddy)
perch [pɜ:ʧ] – окунь
predation – истребление хищниками
raise – разводить, выращивать
rear [riə] – разводить, выращивать
sluice [slu:s] gate – шлюзные ворота, щитовой затвор (шлюза)
waste – отходы

Task 1. Translate the sentences into Russian paying attention to the underlined words.

1) Aquaculture is farming of aquatic organisms in fresh, brackish or salt water. 2) The ancient people in Australia may have raised eels as early as 6000 BC. 3) Carp is the most common fish raised in rice paddies. 4) Bighead and silver carp both feed on plankton. 5) Pond aquaculture uses existing or constructed ponds to rear fish. 6) The water level in the paddy fields ranges from 2.5 to 15 cm deep. 7) Several modifications to the rice paddy allow both fish and rice to coexist. 8) Fish compatibility is important for aquariums. Compatible fish will live together with each other while fish not compatible with each other will fight and try to damage each other or kill the weakest. 9) The primary decomposer of litter in many ecosystems are fungi [ˊfʌnʤai]. 10) Fish in the pond may compete with each other for food, habitat, etc.

II. Reading

Task 2. Read the text and answer the questions.

1. Why did the Chinese rear fish in rice paddies?
2. What compatible organisms did ancient Hawaiians raise in their polyculture systems?

It is believed that[1] the Chinese have been raising food fish in their paddy fields for more than a thousand years, using a system now known as polyculture. Polyculture is the raising of two or more compatible organisms together within an aquaculture system; the different species in the system complement each other and do not compete. They may live in different levels of the water column, and have different feeding niches, for example grazers, invertebrate feeders, detritivores, and so on. In this case[2], the cultivated rice plants would attract insect and mollusc grazers, carp being reared in these paddy fields would feed on these, reducing predation on the rice plants and at the same time[3] fertilising the system. Without the fish, the farmer would need to add nutrients and manage the grazers, likewise[4] a farmer trying to raise the fish in

such an enclosed system without the rice, would have wastes to dispose of, and may have a problem with levels of Biological Oxygen Demand (BOD), this is the O_2 used by bacterial decomposers. The farmer works with a system that partially takes care of itself, and gets both a rice crop and a fish catch into the bargain[5]. As in this example, the raising of both plant and[6] animal within a polyculture system is also sometimes known as aquaponics.

Ancient Hawaiians[7] also carried out a form of aquaculture. Hawaiians used two types of ponds – inshore and offshore. Open-sea ponds were artificially enclosed with rock walls and had sluice gates that connected the pond to the sea. Brackish groundwater, flowing seaward through the porous lava rock, filled depressions[8] in the rock, creating a unique habitat. Freshwater fishponds in upland regions operated as polyculture systems. Taro plants[9] have an edible root[10] and leaves[11] when cooked. These were grown in mounds[12] in the ponds. The fish, mainly mullet and perch would feed on insects predating the taro plants.

Notes

[1] It is believed that – Полагают, что…
[2] in this case – в этом случае
[3] at the same time – в то же самое время
[4] likewise – аналогично
[5] into the bargain – в придачу, помимо того, к тому же
[6] both…and… – и…, и…
[7] Hawaiians [hə´waiənz] – гавайцы, жители Гавайских островов
[8] depression – впадина, низина, углубление
[9] taro plant – таро, колоказия съедобная
[10] root – корень
[11] leaf (*sg*)/leaves (*pl*) – лист / листья
[12] mound – насыпь, холм, кочка

III. Comprehension check

Task 3. Reread the text and mark sentences T (true) or F (false).

1) The practice of aquaculture is ancient and found in many cultures.
2) Rice paddies were used to cultivate various fish species.
3) Compatible species live in different levels of water column.
4) Grazers and detritivores have distinct feeding habits.
5) Chinese farmers had to fertilise their paddy fields.
6) Farmers also had to dispose of fish waste.
7) Both animals and plants can be raised within a polyculture system.
8) Ancient Hawaiians grew taro plant in brackish water.
9) Taro plants were grown by the side of the pond.
10) Mullet and perch fed on taro plants.

Task 4. Match the beginning and the end of the sentences.

1) In polyculture different species	a) nutrients to paddy field with wish.
2) Compatible organisms have different	b) fertilises the system.
3) In paddy fields carp feed	c) feeding niches.
4) Farmers don't need to add	d) complement each other.
5) Fish reared in enclosed system produce	e) on insects and mollusc grazers.
6) Fish waste	f) a lot of waste.

IV. Vocabulary building

Task 5. Match the verbs with objects. Translate these word combinations into Russian.

1) connect	a) nutrients
2) dispose	b) of waste
3) live	c) on insects
4) add	d) the pond to the sea
5) flow	e) in different levels of water column
6) feed	**f)** through porous rock

Task 6. Read the text. Translate it into Russian.

Pond rearing of fish in China is widespread. Fish are commonly raised in association with a land animal such as swine, poultry, or silkworms. The wastes from the land animals are used to feed or fertilize the pond fish. Mulberry trees[1] are often planted on pond dikes[2], permitting mulberry leaves, silkworm frass[3], and silkworm pupae[4] to be added to the pond as they become available. Swine and cattle[5] manure[6] is also added to fertilize the pond. Swine are the most popular animals raised in association with pond aquaculture in China. Pigsties[7] are built directly on the dikes to permit easy flushing[8] of manure to the pond.

Animal manures have two functions in aquaculture. The first is to provide feed to the fish. Most animals do not digest[9] all grain fed, passing some undigested grains[10] through the gastrointestinal tract[11]. These are available for fish to take up and digest. The second function is to provide nutrients for growth of phyto- and zooplankton in the pond. As the manures decompose[12], they release soluble[13] nutrients that are used by other organisms to grow and reproduce. Fish feed directly on these plankton.

Notes

[1] mulberry tree – тутовое дерево
[2] dike – дамба, плотина, насыпь
[3] frass – экскременты насекомых
[4] pupa(*sg.*) / pupae (*pl*) – куколка
[5] cattle – крупный рогатый скот
[6] manure – навоз
[7] pigsty [ˊpigstai] – свинарник
[8] flushing – сбрасывание
[9] digest [ˊdaiʤəst] – усваивать, переваривать
[10] undigested [ˌʌnd(a)iˊʤestid] grain – непереваренное зерно
[11] gastrointestinal tract – пищеварительный тракт
[12] decompose – разлагать на составные части
[13] soluble – растворимый

Task 7. Translate the names of the fish into English. Use the words in the left hand column if necessary. Make sure that you understand the meaning of the sentences.

bighead
carp
catfish
clam
cod
eel
mullet
mussel
oyster
perch
salmon
sea bass
shrimp
tilapia
trout
yellowfish

1) Our fish special tonight is (*лосось*) in a lemon-cream sauce. 2) The Atlantic (*треска*) can change colour at certain water depths. 3) (*Желтохвост*) may be any of several different species of fish. 4) Common (*карп*) is part of traditional Christmas Eve dinner in Western Europe. 5) The (*сом*) is adaptable to a wide range of water conditions. 6) We spent the afternoon fishing for (*форель*). 7) (*Тилапия*) is the fourth-most consumed fish in the USA. 8) (*Морской окунь*) is the name shared by many species of fish. 9) (*Угорь*) begin life as flat and transparent larvae. 10) (*Кефаль*) often leap out of water. 11) (*Окунь*) are carnivorous fish found in most small ponds, lakes, streams, or rivers. 12) (*Устрицы*) have been cultivated since the days of Roman Empire. 13) The company imports between 15 million and 20 million of (*креветки*) per year. 14) In Japan, (*съедобные морские моллюски*) are often an ingredient of mixed seafood dishes. 15) (*Мидии*) feed on plankton and other microscopic creatures which are free-floating in a seawater. 16) (*Толстолобик*) is an important species in aquaculture.

WORD FORMATION

Суффикс **-er** / **-or** используется для образования существительных от глаголов, причем существительное обозначает лицо или предмет, который выполняет действие, названное этим глаголом.

to farm (заниматься сельским хозяйством) – **farmer**
to graze (пастись, щипать траву) – **grazer**

to feed (кормить, питаться чем) – **feeder**

to decompose (разлагать на составные части) – **decomposer**

Образуйте существительные от приведенных ниже глаголов, переведите слова на русский язык:

to act, to teach, to paint, to cook, to breed, to grow, to plant, to cultivate, to dig, to fertilise, to manage, to operate

V. Grammar revision – Pronouns

A) Indefinite pronouns: *some* /*any* /*no* / *every*

	Affirmative (+)	Interrogative (?)	Negative (–)
Countable / Uncountable	some *every*	any	not any / no
People	someone / somebody *everybody*	anyone / anybody	no one / not anyone nobody / not anybody
Things	something *everything*	anything	nothing / not anything
Places	somewhere *everywhere*	anywhere	nowhere / not anywhere

Rememeber!

Any в утвердительных предложениях имеет значение ‘любой, всякий, все что угодно’.

e.g. We are interested in ***any*** information. I can give you ***anything*** you need. We can go ***anywhere*** you like.

Some в вопросительных предложениях употребляется тогда, когда вы предлагаете или просите что-то.

e.g. Would you like ***some*** juice? Could you lend me ***some*** money?

Study the following examples. Notice how the indefinite pronouns are translated into Russian.

1. There were ***some*** people sitting at the table. – За столом сидели ***какие-то*** люди.

2. There’s ***someone*** at the door. – За дверью ***кто-то*** есть.

3. ***Nothing*** is being done to solve the problem. – ***Ничего*** не делается, чтобы решить проблему.

4. I ***don’t think anything*** terrible has happened. – *Я* ***не думаю***, что случилось ***что-то*** ужасное.

5. ***No one*** knows about this discovery. – ***Никто*** не знает об этом открытии.

6. Is there ***anybody*** who speaks French? – Есть ли здесь ***кто-нибудь***, кто говорит по-французски?

7. There was ***something*** wrong with my computer. – ***Что-то*** было не так с моим компьютером.

8. ***Every*** university has a library. – В ***каждом*** университете есть библиотека.

9. We looked for him ***everywhere***. – Мы искали его ***везде***.

10. ***Everybody*** knows the answer. – ***Все*** знают ответ.

Look at the picture and read the description. Pay attention to the use of the indefinite pronouns. Translate the sentences into Russian.

The children are **somewhere** outside the building. There aren't **any** chairs. The teacher is writing **something** on the board. **Everybody** is looking at the board.

Task 8. Read the text and translate it into Russian.

Everybody, Somebody, Anybody and Nobody

This is the story about four people named **Everybody, Somebody, Anybody and Nobody**. There was an important job to be done and Everybody was sure that Somebody would do it Anybody could have done it, but Nobody did it. Somebody got angry about that because it was Everybody's job. Everybody thought Anybody could do it, but Nobody realized that Everybody wouldn't do it. It ended up that Everybody blamed Somebody when Nobody did what Anybody could have done.

Task 9. Choose the right word.

1) There's *someone/anyone* at the door. I heard the doorbell ring. 2) *Somebody/Nobody* lives in that old house. It's been empty for years. 3) Let's have *anything/something* to drink. How about orange juice? 4) Remember, don't tell *anybody/nobody* about the money. It 's a secret. 5) I don't want *something/anything* to drink. I'm not thirsty. 6) I can 't find my keys.

I've looked *anywhere/everywhere*. 7) I went shopping, but I didn 't buy *anything /something.*8) Don 't sit there doing *something/nothing*. Help me to do the washing-up. 9) We can't decide where to go on holiday. There's *nowhere /anywhere* that we all like. 10) Let 's have a party. *Someone/Everyone* likes parties. 11) I didn 't get *nothing/anything* from Pete for my birthday. He forgot it. 12) I've had a terrible day. *Everything/Anything* went wrong. 13) Can you get me *something/anything* to drink, please? 14) I put my keys *nowhere/somewhere*, but I can't remember where. 15) Why is Nick looking under the table? Has he lost *something/anything*? 16) Trig 's taken all the food out of the fridge. It's empty. There's *something/nothing* in it! 17) We' re looking for Chip. We can't find him *anywhere/somewhere*. 18) My eye hurts. I think there's *something/anything* in it.

Task 10. Fill in the gaps with *some, any, no* or one of their compounds.

1. A: Is *...anything...* the matter with Dawn? She looks upset.
   B: She had an argument with her friend today.
2. A: I think _____ is trying to break into that house.
   B: You're right. We should call the police.
3. A: We've got _____ time to make a cake before the party!
   B: I'll go out and buy one then.
4. A: I'm thinking of moving to London.
   B: Really? My boss has a house _____ near London.
5. A: It was very busy in town today.
   B: I know. There was hardly _____ to park.
6. A: I suppose I should make _____ for dinner.
   B: I'll help you if you like.
7. A: What's on TV tonight?
   B: I looked in the TV guide. There's hardly _____ good on tonight.
8. A: Do you like living in Brighton?
   B: Yes, but _____ will ever mean as much to me as my home town.
9. A: Did you have a good holiday in England?
   B: Yes. There was hardly _____ rain all week.
10. A: Did you call Sarah this evening?
    B: Yes, but _____ was at home, so I left a message on the answering machine.

B) Personal and Possessive Pronouns

Personal pronouns		Possessive pronouns	
Subject form	**Object form**	**Possessive adjectives**	**Possessive pronouns**
Who? What?	**Whom? What?**	**Whose?**	**Whose?**
I – я **you** – ты **he** – он **she** – она **it** – он, она, оно **we** – мы **you** – вы **they** – они	**me** – меня, мне **you** – тебя, тебе **him** – его, ему **her** – ее, ей **it** – его, ей **us** – нас, нам **you** – вас, вам **them** – их, им	**my** – мой **your** – ваш **his** – его **her** – ее **its** – его, её **our** – наш **your** – ваш **their** – их	**mine** – мой **yours** – ваш **his** – его **hers** – её **its** – его, её **ours** – наш **yours** – ваш **theirs** – их

Remember!

Possessive adjectives всегда используются с последующим существительным: This is *my house.*

Possessive pronouns всегда употребляются без последующего существительного: This house *is mine*.

Task 11. Fill in the gap with the correct *subject* or *object* pronouns.

1) A: Do you like Debra's new coat? _*It*_ was a great bargain!
   B: Yes, [1)] ___do. [2)] ___ looks wonderful on [3)]___!
2) A: We visited Pam and Harry in their new house last night.
   B: When did [4)] ___ move in?
3) A: Would you like to go to a coffee shop or a fast food restaurant?
   B: [5)] ___ really don't mind. [6)] ___ both sound like a great idea.
4) A: Have you met our new teacher, Mr Bays, yet?
   B: Yes, [7)] ___ is quite funny actually.
5) A: How did your dad meet your mum?
   B: [8)] ___ met [9)] ___ at university.

Task 12. Fill in the correct *possessive adjectives* and *possessive pronouns.*

1) A: I just picked up this parcel from the post office. Is it *yours*?
   B: I'm not sure, but I've been expecting one, so I really hope it's [1)] ____.
2) A: We really need to hurry up or we'll miss [2)] ___ connecting flight.
   B: OK. I'll pay [3)] ___ bill and we can go.
3) A: That shirt really suits you. Is it new?

B: No, it isn't [4)] ___ actually. I borrowed it from my brother.

4) A: Dad, could I borrow Mum's car tonight?
B: Well, you had better take [5)] ___ as [6)] ___ is at the garage, son.

5) A: I can't use [7)] ___ computer; it's frozen.
B: Don't worry. It's Mike's day off today. You can use [8)] ___ .

Task 13. Read the text and fill in the word that best fits each gap.

Hi Mick,

Thanks for your e-mail. I miss 1) *you* so very much. We've moved into 2) _____ new house and I've started at my new school. I like the teachers there. 3) _____ are really friendly. 4) _____ have already made a few friends. One is Spanish and 5) _____ name is Carmela, the other is Polish and 6) _____ name is Matyas, but I call 7) _____ Matt for short. I really like 8) _____ a lot.

Mum is organising a house-warming party next weekend. Do you think you and Nancy could come? 9) _____'d really love to have you stay all weekend. Dad is going to show us 10) _____ cooking talent too. He wants all of 11) _____ to have a barbecue. Do you remember what happened last time Dad lit the grill? I bet you're laughing! He burnt the neighbour's apple tree!

Anyway, that is all my news. Please write to 12) _____ soon!

Hope to see you next weekend !

Patricia

Learn some fish idioms!

* **drink like a fish** (*v. phr.*) – пить как лошадь, безбожно пить, глушить водку, сильно пьянствовать

Translate these sentences.

John is a nice guy but, unfortunately, he drinks like a fish.

My flatmate Cherry drinks like a fish.

* **like a fish out of water** (*n., phr.*) – не в своей тарелке, некомпетентный, несведущий, не по себе (словно рыба, вытащенная на берег)

Translate these sentences.

Because Ed could not swim, he felt like a fish out of water at the beach.

She was the only girl at the party not in a formal dress and she felt like a fish out of water.

UNIT 3

THE WORLD FOOD PRIZE

I. Words to know before you read

achievements [ə´ʧi:vmənts] – достижения, заслуги
address an issue [´iʃu] – решать вопрос
advance [əd´vɑ:ns] – (*v*) продвигать, ускорять
announce [ə´naʊns] – объявлять, заявлять
availability [ə¸veilə´biliti] – наличие, доступность
award [ə´wɔ:d] – (*n*) награда, (*v*) награждать, присуждать премию
coincide [¸kəʊin´said] with – совпадать с, приходиться на
conceive [kən´si:v] – задумывать, замышлять
contribution – вклад, содействие
contributor [kən´tribjutə] – жертвователь
emphasize [´emfəsaiz] – подчеркивать
existence [ig´zist(ə)ns] – существование
expand [ik´spænd] – расширять
field [fi:ld] – (*зд.*) область
found [faʊnd] – основать
hold (held, held) – (*зд.*) проводить (мероприятие)
honour [´ɒnə] – (*v*) чествовать; (*n*) почет, уважение, почести
hunger [´hʌŋgə] – голод
importance [im´pɔ:t(ə)ns] – важность, важная роль
include [in´klu:d] – включать
inspire [in´spaiə] – воодушевлять, стимулировать
involved in – связанный с
link – звено, связь
manufacturing [¸mænju´fækt(ə)riŋ] – производство
means (*n*) – способ, средство
nutrition [nju´triʃən] – питание, пища, питательность
quality [´kwɒliti] – качество
quantity [´kwɒntiti] – количество
recognize [´rekəgnaiz] – признавать
related to – связанный с, относящийся к
run (ran, run) – (*зд.*) управлять
science [´saiəns] – наука
scope [skəʊp] – масштаб, область действия, объем и содержание
sustainable [sə´stein(ə)bl] – экобезопасный, устойчивый

Task 1. Practise reading the international words, guess their meaning.

Individual [ˌindi´vidʒʊəl](*n*); technology [tek´nɒlədʒi]; laureate [´lɒriət]; philanthropist [fi´lænθrəpist]; fund [fʌnd] (*n*), (*v*); idea [ai´diə]; corporation [kɔ:pə´reiʃ(ə)n]; economics [i:kə´nɒmiks]; organize [´ɔ:gənaiz]; structure [´strʌktʃə]; sponsor [´spɒnsə] (*n*), (*v*); symposium [sim´pəʊziəm].

Task 2. Learn the adverbs below. Translate the sentences paying attention to the underlined words. Replace them with the synonyms from the list of adverbs.

annually [´ænjʊəli] – ежегодно
currently [´kʌrəntli] – теперь, в настоящее время, ныне
favourably [´feiv(ə)rəbli] – одобрительно, хорошо
officially [ə´fiʃəli] – официально
partially [´pɑ:ʃ(ə)li] – частично
solely [səʊlli] – исключительно, только, единственно

1) I don't think we've been formally introduced. 2) He is presently working on his first novel. 3) I think he will respond positively. 4) The building is partly destroyed in the fire. 5) We're doing it exclusively for ourselves. 6) The jazz festival is held yearly in July.

Task 3. Match the English phrases and their Russian equivalents.

1) award ceremony	a) бывший посол
2) chief executive	b) Всемирная продовольственная премия
3) food chain	c) высший руководящий состав
4) food security	d) Нобелевская премия мира
5) food supply	e) политическое руководство
6) former ambassador	f) президент фирмы
7) human development	g) пример для подражания
8) management structure	h) снабжение продовольствием
9) Nobel Peace Prize	i) развитие человеческого общества
10) political leadership	j) система производства и сбыта продовольственной продукции
11) poverty alleviation [´pɔvəti əˌli:vi´eiʃn]	k) снижение уровня бедности
12) role model	l) управляющая структура
13) senior management	m) церемония награждения
14) World Food Prize	n) продовольственная безопасность

II. Reading

Task 4. Read the text to find answers to the questions.

1. Who did the idea of the World Food Prize belong to?
2. When was the World Food Prize established?
3. How often is the prize awarded?
4. To whom is the World Food Prize given to?

Logo of the World Food Prize Foundation

The World Food Prize is an international award recognizing the achievements of individuals who have advanced human development by improving the quality, quantity, or availability of food in the world. Since 1987, the prize has been awarded annually to recognize contributions in any field involved in the world food supply: food and agriculture science and technology, manufacturing, marketing, nutrition, economics, poverty alleviation, political leadership, and the social sciences. The World Food Prize Foundation is currently run by Kenneth M. Quinn, former U.S. Ambassador to Cambodia.

Conceived by Nobel Peace Prize Laureate Norman Borlaug[1], the prize emphasizes the importance of a nutritious and sustainable food supply for all people. Borlaug saw the prize as a means of establishing role models who would inspire others.

In 1985, Borlaug met with the chief executive of General Foods Corporation[2], James Fergusen. Norman Borlaug presented his long-standing desire for the establishment of a major prize for agriculture. The idea of a prize was met favourably by the Senior General Foods Management, but they expanded the scope of the prize to include all of the links of the food chain – from farm to table. General Foods Corporation organized a prize management structure and in 1986 announced the founding of the General Foods World Food Prize. This prize was funded solely by the General Foods Fund for the first four years of its existence and partially funded by the General Foods Fund and other contributors in the fifth year.

Since 1990, the World Food Prize has been sponsored by businessman and philanthropist, John Ruan.

Laureates are honoured and officially awarded their prize in Des Moines[3], Iowa[4], in a televised award ceremony held in the House Chamber[5] of the Iowa State Capitol[6]. The Award Ceremony coincides with the Norman E. Borlaug International Symposium, known as the Borlaug Dialogue, which addresses an issue related to hunger and food security each year.

Notes

[1] **Norman E. Borlaug** – Норман Эрнест Борлоуг, американский агроном и селекционер, известный как «отец Зеленой революции», лауреат Нобелевской премии мира 1970 г.
[2] **General Foods Corporation** – корпорация "General Foods", выпускала широкий круг продуктов питания
[3] **Des Moines** – Де-Мойн, столица и крупнейший город штата Айова
[4] **Iowa, State** [ˊaiəwə] – Айова, штат на Среднем Западе США
[5] **House Chamber** – зал заседаний Палаты представителей
[6] **Capitol** [ˊkæpitl] – здание, в котором помещаются органы гос. власти

III. Comprehension check

Task 5. Reread the text and mark the sentences T (true) or F (false).

1) James Fergusen is a former US Ambassador to Cambodia.
2) Norman Borlaug met with James Fergusen in1987.
3) The World Food Prize recognizes contributions in any field involved in food supply.
4) The World Food Prize is a major prize for agriculture.
5) The General Foods Fund sponsored the World Food Prize for 15 years.
6) Presently the World Food Prize is funded by businessman and philanthropist John Ruan.
7) Laureates are awarded their prize at the N. Borlaug International Symposium.

Task 6. Fill in the gaps with words and phrases from the box.

based …	founded	individuals	quantity
recognized	world	contributions	Nobel Peace Prize

The World Food Prize was 1)_____ in 1986 by Dr. Norman E. Borlaug, recipient of the 1970 2)_____. Since then, the World Food Prize has honoured outstanding 3)_____ who have made vital 4) _____ to improving the quality, 5)_____ or availability of food throughout the 6) _____. Laureates have been 7) _____ from Bangladesh, Brazil, China, Denmark, Ethiopia, India, Israel, Mexico, Sierra Leone, Switzerland, the United Kingdom, the United Nations and the United States. The World Food Prize Foundation is 8)_____ in Des Moines, Iowa, in the United States.

IV. Vocabulary building

Task 7. Find in the text the English equivalents of the following words and phrases.

A) международная награда; политическое руководство; общественные науки; давнее желание; церемония награждения, передаваемая по телевидению;

B) улучшение количества, качества и доступности продовольствия; средство создания примера для подражания; вдохновлять других; главный приз; объявить о создании премии; финансировать; оказывать финансовую поддержку.

Task 8. Which of these words can go together? Join them. Consult the vocabulary list and the text if necessary.

1) to recognize	
2) to advance	a) a ceremony
3) to emphasize	b) achievements
4) to establish	c) all the links of the food chain
5) to fund	d) human development
6) to sponsor	e) laureates
7) to award	f) quality of food
8) to hold (held, held)	g) role models
9) to honour	h) the foundation
10) to improve	i) the importance
11) to run (ran, run)	j) the prize (x3)
12) to include	

Task 9. Fill in each blank with one of the words from the box.

contribution • award • food security
annually • nutritious • referred to • founded

1) In 1970, Norman Borlaug realized there should be a prestigious, international _____ given each year to honor the work of great agricultural scientists working to end hunger and improve the food supply.

2) In 1986, he _____ The World Food Prize.

3) The World Food Prize is now often _____ as the "Nobel Prize for Food and Agriculture."

4) He made an outstanding _____ to science.

5) International conference on _____ was held in May.

6) World Food prize is awarded _____.
7) Oily fish, such as salmon and tuna, are not only _____ , but tasty.

WORD FORMATION

Task 10. Translate the words paying attention to their suffixes and prefixes.

1) to achieve, achievement, achiever, non-achiever; 2) to develop, development, developer, developing; 3) to contribute, contributor, contribution; 4) nutrition, nutritious, nutritionist, nutrient; 5) poor, poverty, poorly, to impoverish; 6) to manage, management, manager.

Task 11. Complete the sentences with one of the words that contain the same root.

nutrients *nutrition* *nutritionist* *nutritious*	1) Wholemeal bread is more _____ than white bread. 2) Poor _____ can cause heart disease in later life. 3) He is a plant _____ by education. 4) The plant absorbs _____ from the soil.
impoverish *poor* *poorly* *poverty*	1) They are living in extreme _____. 2) She came from a _____ family. 3) The article was _____ written. 4) Fast-growing trees remove nutrients and _____ the soil.
development *developing* *develop*	1) In _____ countries governments control many sectors of the economy. 2) The future of cryonics involves the _____ of molecular technology. 3) It took many years and a lot of work to _____ these new tools.
achieve *achievement* *achiever*	1) His major _____ as a scientist is this new drug. 2) I want to _____much in my life. 3) Ann does well at school and she's a high _____.
contribute *contribution* *contributor*	1) She made an outstanding _____ to science. 2) Dr Win was a major _____ to the research. 3) Fresh air and exercise _____ to good health.
manage *manager* *management*	1) I demand to see the _____ . 2) Many companies go bankrupt due to bad _____ . 3) Machines are more efficient, humans are complicated and difficult to _____ .

V. Grammar revision – Quantifiers

Type of sentence	Countable nouns	Uncountable nouns / Verbs
Affirmative (+)	**a lot of / lots of / plenty of** – много	
Affirmative (+)	**so many** – так много **very many** – очень много **too many** – слишком много	**so much** – так много **very much** – очень много **too much** – слишком много
Negative (-) **Interrogative (?)**	**many** – много	**much** – много
All types	**few** – мало (недостаточно)	**little** – мало (недостаточно)
All types	**a few** – мало, немного, несколько (достаточно)	**a little** –мало, немного (но достаточно)
All types	**quite a few** – довольно много, порядочно	**quite a bit** – довольно много, изрядное количество

Study the following examples and then do the exercises.

1) There ***are not so many*** people here. – Здесь *не так много* народу.

2) There are ***too many*** cars on the road. – На дороге *слишком много* машин.

3) I eat ***a lot of*** pasta. – Я ем *много* макарон.

4) Have you got ***many*** friends? – У тебя *много* друзей?

5) I ***haven't got many*** friends. – У меня *немного* друзей.

6) Do you drink ***much*** coffee? – Вы пьете *много* кофе?

7) No, I ***don't like*** it ***very much***. – Нет, я его *не очень люблю*.

8) I've got ***very few friends***, so I'm sad. – У меня *очень мало* друзей, поэтому мне грустно.

9) They have ***little money***. They are poor. – У них *мало денег*. Они бедны.

10) I've got ***a few friends***, so I'm not lonely. – У меня есть *несколько друзей*, поэтому я не одинок.

11) They have ***a little money***, so they are not poor. – У них есть *немного денег*, поэтому они не бедны.

12) ***Quite a few*** companies would like to get in on the project. – *Немало* компаний хотело бы поучаствовать в этом проекте.

13) We'***ve accomplished quite a bit*** over the past ten months. – Мы *немало достигли* за последние десять месяцев.

Task 12. Complete the sentences using *much, many* or *a lot of*. Use *a lot of* in the positive sentences only.

1) Have you got *much* work to do? 2) We bought *a lot of* fruit but no vegetables. 3) There isn't _____ information in this book. 4) How _____ children have they got? 5) He's got _____ problems at the moment. 6) We saw _____ beautiful birds on the walk. 7) I don't know _____ people here. Do you? 8) There were _____ phone calls this morning. 9) We couldn't go out because I didn't have _____ money with me. 10) There aren't _____ tourists here this year. 11) I don't have breakfast before work but I drink _____ tea. 12) Do you smoke _____ cigarettes? 13) How _____ money did you spend? 14) Are there going to be _____ people at the party? 15) She's ill and she's not eating _____ food.

Task 13. Complete the sentences using *a few* or *a little*.

1) There are *a few* people coming to visit us tonight. 2) We've only got ._____ time to finish this work. 3) I took _____ books with me to read on holiday. 4) Can I have just _____ juice, please? 5) 'Was there any food at the party?' 'Yes, there was _____ . 6) I only take _____ sugar in my tea because I know sugar's bad for your teeth. 7) 'Did you take any photographs at the wedding?' 'Yes, I took _____ . 8) I met _____ friends for a meal in town last night. 9) 'When you were in Africa, did you see any lions?' 'Yes, I saw _____ . 10) I'm not a vegetarian but I only eat _____ meat. 11) _____ flowers are starting to come up in the garden. 12) I'm not sure where we're going for our holidays but I've got _____ ideas. 13) I bought _____ new cassettes with my birthday money. 14) 'Have you got any money with you?' 'I've got _____ '. 15 'Is there any soap in the bathroom?' 'Yes, there's_____ .

Task 14. Choose the right word.

1) I have a lot of records, but very ***few/little/very little*** CDs. 2) We have ***very little/very few/few*** spaghetti, so I can t make Spaghetti Bolognese. 3) I'm tired. I didn't get ***many/much/few*** sleep last night. 4) I've made ***many/much/a lot of*** notes, but I haven t written my essay yet. 5) This coffee is bitter. It needs ***a few/a little/little*** more sugar. 6) I have invited ***a few/a lot***

of/much people to the party. I hope there will be room for them all. 7) I don't have ***many/much/few*** time at the moment. I'll talk to you later. 8) I have had ***a few/very few/very little*** success in my search for a job. 9) There are ***much/a lot of /a little*** reasons why he should go to university. 10) I'd love to come to the beach. I just need ***a few/a little/ many*** minutes to get ready. 11) There are ***much/little/few*** people who are as hard-working as James. 12) I have ***little/a little/a few*** work to do before I can leave. 13) I made ***a lot/a little/a few*** biscuits this morning. Would you like to try one? 14) There weren't ***few/much/many*** people in town today It was very quiet. 15) There is ***a little/little/a few*** chance of his getting the job. He has no experience.

Learn some fish idioms!

*__kettle of fish__ – затруднительное положение, неудача
*__a pretty / nice / fine kettle of fish__ – беспорядок, суматоха; запутанное и неприятное положение; веселенькая история!
*__another kettle of fish__ – совсем другой коленкор / другое дело
*__this is a different kettle of fish__ – совсем другое дело

Translate these sentences.

I thought he needed money, but it was another kettle of fish – his car had disappeared.

He had two flat tires (спущенные шины) and no spare (запасная шина) on a country road at night, which was certainly a pretty kettle of fish.

This is a fine kettle of fish! I forgot my book.

*__neither fish, nor fowl__ – ни рыба, ни мясо; ни два ни полтора; ни то ни се; ни богу свечка, ни черту кочерга

Translate these sentences.

The man is neither fish nor fowl; he votes Democrat or Republican according to which will do him the most good.

The movie is neither fish nor fowl; it is a funny love story.

UNIT 4

MODADUGU GUPTA

I. Words to know before you read

advise [əd´vɑiz] –советовать
approach [ə´prəʊtʃ] – подход
associate [ə´səʊʃi´eit] – сотрудник
association with [ə´səʊsi´eiʃn] – сотрудничество с
be notable [´nəʊtəbl]for – славиться (чем), отличаться
boost – увеличить, существенно повысить
breed (bred, bred) (*v*) – разводить; breed (*n*) – порода
cause [kɔ:z] – (*v*) вызывать что; быть причиной; привести к
common [´kɒmən] – обычный, распространенный
concede [kən´si:d] – допускать, неохотно соглашаться
convert [kɒn´vɜ:t] – превратить, переделывать, преобразовывать
decline [di´klain] – снижение, сокращение
double [dʌbl] – удваивать
dwindle [´dwindl] – сокращаться, уменьшаться, убывать
earn a doctorate – получить степень доктора философии
educate [´edjʊkeit] – просвещать, вести разъяснительную работу
enhance [in´hɑ:ns] – улучшать
experience [ik´spi(ə)riəns] – испытывать, переживать
fishery – рыбохозяйственная организация, рыболовный промысел
include [in´klu:d] – включать
integrate [´intigreit] – включать в состав
involvement [in´vɒlvmənt] – вовлечение, привлечение, приобщение
livelihood [´lɑivlihʊd] – средства к существованию, жизнедеятельность
meet (met, met) a need – удовлетворять потребность
object to [ɒb´ʤekt] – возражать, не одобрять
overuse [ˌəʊvə´ju:s] – злоупотреблять, чрезмерно использовать
persuade [pə´sweid] – убеждать, склонять, уговаривать
pose hasard [´hæzəd] to smth. – представлять опасность
spread (spread, spread) [spred] – (*v*) распространять, (*n*) распространение
yield [ji:ld] – количество добытого или произведенного продукта

Task 1. Practise reading the following words. Learn them.

Pioneer [ˌpaiəˊniə] – положить начало, быть инициатором; routine [ruːˊtiːn] – заведенный порядок, образ жизни, повседневность; technique [tekˊniːk] – рабочий прием, техника выполнения, методика; species [ˊspiːʃiːz] – вид (биологический); variety [vəˊraiəti] – вид, разнообразие; Asia [eiʒə] – Азия; decade [ˊdekeid] – десятилетие.

Task 2. Transale these word combinations into Russian.

1) Fisheries research institute, 2) food yields, 3) research associate, 4) assistant director general, 5) wild fish stock, 6) aquaculture methods, 7) aquaculture techniques, 8) food production, 9) fish production, 10) fresh water fish production, 11) fish farming, 12) fish farms, 13) fish feed, 14) fish harvests, 15) fish food, 16) farm wastes, 17) chicken manure, 18) water bodies, 19) fivefold increase, 20) health hazards.

II. Reading

Task 3. Read the text and answer the questions.

1. When did he get the World Food Prize?
2. What was he awarded the World Food Prize for?
3. What is his contribution to the development of aquaculture?

Modadugu Gupta (born Aug. 17, 1939) is an Indian scientist who boosted food yields in impoverished areas with innovative approaches to aquaculture.

Gupta earned a doctorate from the University of Calcutta and joined the Indian Council of Agricultural Research as a research associate. He later began a longtime association with the WorldFish Center, eventually serving as the organization's assistant director general. In the 1970s, at a time when intense harvesting by commercial fishing fleets had caused a serious decline in the world's wild fish stock, Gupta began introducing his aquaculture methods to poor farmers in India, demonstrating to them how they could easily integrate aquaculture into their routines. Freshwater fish production in the country soon more than doubled.

Gupta subsequently became a leading figure in the so-called Blue Revolution, the expansion of fish farming that was credited with improving the nutrition and enhancing the livelihoods of the rural poor through the spread of techniques that could significantly boost food production. Many of these techniques had been pioneered by Gupta. They included breeding species of carp that are adaptable to a variety of harsh environments, using common farm wastes such as weeds and chicken manure as fish food, and converting flooded fields and other seasonal water bodies into places to grow fish. Some areas of South and Southeast Asia where Gupta had worked with local farmers experienced as much as fivefold increases in fish harvests.

From 1986 to 1995 Gupta worked with the Bangladesh Fisheries Research Institute. His efforts in Bangladesh were notable for his involvement of rural women, who traditionally were limited to working inside the home. With the help of local nongovernmental organizations, Gupta persuaded many women to start small fish farms in their areas. He also helped spread aquaculture in Laos, Thailand, and Vietnam.

Some critics objected to Gupta's work on the basis that fish farming posed environmental as well as health hazards. Gupta conceded that some farmers overused fish feed and fertilizer, but he said that the solution was to educate these farmers in proper aquaculture techniques. He also insisted that aquaculture was meeting a crucial need as the world's wild fish stock dwindled. Gupta saw great potential for aquaculture in Africa, and by 2006 he was advising a number of countries there. For his decades of effort and research in aquaculture, Gupta was awarded the international World Food Prize in October 2005.

Notes

Calcutta [kal′kʌtə] – г. Калькутта

Indian Council of Agricultural Research – Индийский совет по научным исследованиям в области сельского хозяйства.

III. Comprehension check

Task 4. Read the text again and find the English equivalents of the following word combinations.

1) Бедные районы, 2) инновационный подход к аквакультуре, 3) длительное сотрудничество, 4) интенсивный вылов, 5) рыбопромысловые суда, 6) сильное (внушающее опасение) сокращение рыбных ресурсов, 7) бедные фермеры, 8) местные фермеры, 9) ведущий деятель (главная фигура), 10) так называемая Голубая революция, 11) неблагоприятные условия окружающей среды, 12) обычные сельскохозяйственные отходы, 13) затопляемые поля, 14) сезонные водные объекты, 15) сельские женщины, 16) неправительственные организации, 17) надлежащие методы рыбоводства, 18) опасность для окружающей среды, 19) жизненно важная необходимость.

Task 5. Answer the questions.

1) What country is Modadugu Gupta from?
2) Where did he obtain his doctorate degree?
3) Where did he work after graduating from the university?
4) When did he begin introducing his aquaculture methods? Why?
5) What were the results of his work with poor farmers in India?
6) Why is Modadugu Gupta considered to be a leading figure in the so-called Blue Revolution?
7) What are the aquaculture techniques pioneered by Gupta?
8) What countries did Gupta help to spread aquaculture in?
9) What in particular did he do in Bangladesh?
10) Why did some people raise objections to Gupta's work?
11) How in his opinion the problem should be solved?

IV. Vocabulary building

Task 6. Fill in the gaps with the words and phrases from the box.

• *developed* • *enhance* • *awarded* • *poor women* •
• *ceremony* • *other countries* • *production* • *fish farming* •
• *environmental damage* • *fisheries research institute* •

…

Indian gets World Food Prize

An Indian scientist, Dr Modadugu Vijay Gupta, has been 1) _____ the $ 250,000 World Food Prize for his work to 2) _____ nutrition for over one million people, mostly very 3) _____.

Dr Gupta's name was announced by the World Food Prize Foundation at a 4) _____ at the US State Department at Washington DC.

Dr Gupta was till his retirement the Assistant Director General at WorldFish, an international 5) _____.

Through Dr Gupta's dedicated and sustained efforts in Bangladesh, Laos and 6) _____ in Southeast Asia, he made small-scale aquaculture a viable means for over one million very poor farmers and women to improve their family's nutrition and well-being.

As a result of Dr Gupta's efforts, freshwater fish 7) _____ has risen dramatically in these countries by as much as three to five times. He 8) _____ unique methods of 9) _____ , requiring little cost while causing no 10) _____ .

Task 7. Choose the correct alternative for each sentence.

1. Dr. Modadugu Gupta was named the 2005 World Food Prize Laureate for his exceptional achievement in enriching the diets and lives of the world's most (*impoverished* / *prosperous*) families.

2. His promotion of aquaculture has (*prevented* / *contributed to*) the economic and social empowerment ([ɪm´pɑʊəmənt] – расширение возможностей) of men and women in poor and rural areas.

3. Dr Gupta taught poor and landless people to recycle (*farm wastes* / *fertilisers*) such as rice bran, weeds, and manure to support and grow larger fish stock.

4. He advocated the polyculture technique of (*enhancing* / *raising*) multiple species of fish in one pond habitat.

5. The carp varieties he (*advised* / *introduced*) in Vietnam currently make up 30 to 40 percent of all freshwater fish production.

6. Dr. Gupta's technologies (*overused* / *boosted*) Bangladesh's fish yields from 304 kilograms per hectare to over 2,500 kilograms per hectare in less than a year.

7. Asia's poorest fish farmers can now provide (*nutrition* / *experience*) for their families with enough fish

Task 8. Match the beginning and the end of the sentences.

1) They don't have enough food to meet	a) a health hazard to them or their children.
2) Gupta persuaded many women to start	b) a serious decline in the world's wild fish stock.
3) He was awarded the World Food Prize	c) food production.
4) Commercial fishing fleets caused	d) for his exceptional achievements in aquaculture.

5) They have a right to know if contaminants pose	e) small fish farms in their areas.
6) Farmers' organizations have used their profits to boost	f) their needs.

Task 9. Read the interview with Dr Modadugu Gupta. Match the questions with the answers.

INTERVIEW WITH MODADUGU VIJAY GUPTA

A pioneer of Southeast Asia's blue revolution, this fisheries scientist has won the '05 World Food Prize

1) Tell us about the work that got you the prize.
2) Is fish really the poor peoples' food or their livelihood?
3) Since many Indians are vegetarian, aquaculture is yet to catch on in a big way...
4) Are we doing well in exports?
5) Who are the leaders in Asia?
6) How bad is the over-exploitation of fish?
7) Is fish farming harmful to the environment?
8) Fish varieties like hilsa are endangered?
9) Isn't fish healthier than meat?
10) Do you eat fish?

A) My wife is a vegetarian, so I eat fish when I'm away from home.

B) We have good potential, especially in shrimp.

C) It's on doubling fish production using low-cost inputs like compost, weeds, etc; technologies for culturing fish in seasonal ponds, roadside canals in Bangladesh; research on fast-growing strains of fish.

D) Over-exploitation and changes in habitat have caused a sharp fall in hilsa population

E) China, Thailand and Taiwan, besides India.

F) Our per capita consumption is about 4 kg/year (global average is 15 kg). Still, India is the second largest producer (one million tonnes) after China.

G) If done properly, it isn't. Environment-friendly aquaculture is the slogan of the decade.

H) Fish gives 50–80 per cent of animal protein intake to the poor. It's also their livelihood. Declining catches are leading to malnutrition.

I) Fish stocks all over have reached their maximum sustainable yields. India is no exception. Going back to normal will take time.

J) Fish is rich in a number of vitamins. People all over the world are moving from red meat to fish.

(Source: https://www.outlookindia.com/magazine/story/modadugu-vijay-gupta/227896)

WORD FORMATION

Префикс **over-** является продуктивным и служит для образования глаголов, существительных и прилагательных. С его помощью часто выражается идея '*чрезмерности, большого количества того, что выражено основой*', сравн. следующие примеры:

overnutrition (*n*) – переедание;
overfishing (*n*) – чрезмерный вылов рыбы;
overactive (*adj*) – сверхактивный;
overmature (*adj*) – перезревший, переспелый;
overuse (*v*) – злоупотреблять, чрезмерно использовать;
overfish (*v*) – истощать рыбные запасы.

Task 10. Think of the English variant of the words in brackets (choose from the words in the box) and then translate sentences into Russian.

overproduces	overeat	overwork	overgrown	overloaded
overdrink	overdeveloped	overqualified	overlived	oversmoke

1) They didn't hire her because she was (*слишком высокой квалификации*) for the job. 2) Depression is often caused by the cumulative effects of stress and (*переутомлением*). 3) The weeds have (*заполонили*) the garden. 4) Many of us (*слишком много едят, пьют*), and (*курят*). 5) The kind of agricultural system that now predominates in the (*наиболее развитых*) countries. 6) The bus was (*перегружен*) with tourists and their luggage. 7) The country (*производит слишком много*) cars. 8) He (*пережил*) his wife.

V. Grammar revision – Comparisons

A) Comparative and Superlative Adjectives

Adjective	Comparative	Superlative
Short adjectives		
small	small**er**	the small**est**
nice	nic**er**	the nic**est**
big	bi**gger**	the bi**ggest**
busy	bus**ier**	the bus**iest**

Long adjectives		
boring expensive	**more / less** boring **more / less** expensive	**the most / least** boring **the most / least** expensive
Irregular adjectives		
good bad much / many little far	better worse more less farther / further	the best the worst the most the least the farthest / the furthest

Task 11. Give the correct comparative and superlative forms of the adjectives. Translate them into Russian.

a) polite, lazy, funny, good, friendly, clever, careful, interesting, thin, fat;
b) small, old, short, large, poor, rich, helpful, bad, serious, easy;
c) beautiful, long, happy, little, strong, big, tall, fast, far, light;
d) expensive, difficult, pretty, bad, many, stupid, new, efficient, little, good;
e) bright, tiny, nice, sporty, young, bad, dangerous, exciting, good, far;
f) great, few, high, many, low, comfortable, cold, noisy, ugly, bad;
g) quick, hot, sunny, popular, deep, narrow, sunny, good, little, big.

B) Types of Comparison

as + adjective + **as** **not so/ as** + adjective + **as**	Ted is ***as tall as*** Jim. Тед *такой же высокий, как* и Джим. Kate ***isn't so clever as*** her sister (is). Кети *не так умна, как* ее сестра.
comparative form + **than**	Tina is ***shorter than*** Pam. Тина *ниже ростом, чем* Пэм. This chair is ***more comfortable than*** that one. Этот стул *менее удобный, чем* тот.
the + superlative form + **of/in**	Peter is ***the smartest of*** all my students. Петр *самый толковый из* моих студентов. It is ***the most expensive restaurant in*** our town. Это самый дорогой ресторан в нашем городе.
the + comparative, **the** + comparative	***The earlier*** you leave, ***the earlier*** you'll be back. *Чем раньше* вы уйдете, *тем раньше* вы вернетесь. ***The more reliable***, ***the more expensive*** a car is. *Чем надежнее* машина, *тем она дороже*.
Comparative + comparative	The story ***is becoming more and more interesting***. Рассказ *становится все более и более интересным*. He walked ***faster and faster***. Он шел все *быстрее и быстрее*.
twice (three times) as…**as**…	Their house is ***twice as*** big ***as*** ours. Их дом *в два раза больше, чем* наш.

Task 12. Translate these sentences into Russian paying attention to the words in italics.

1) The world's wild fisheries become *more and more exhausted.* 2) In 2016 Bangladesh's farmers produced 2.2m tonnes of fish. That is *more than* its fishermen caught in the wild, and *more than* fish farmers produced in any other country except China, India, Indonesia and Vietnam. The domestic farmed-fish industry has doubled in size since 2008 and is *19 times bigger than* it was in 1984. 3) Aquaculture is probably *the world's fastest growing* form of food production. 4) *The oldest fish-farming systems* were developed in eastern Asia. 5) China is without a doubt *the world's largest producer* of farmed fish. 6) Aquaculture requires *about twice as much labour per acre as rice farming*. 7) As people *get richer,* they eat *more fish*. 8) Salmon is now the third *most popular* seafood in America. 9) The use of antibiotics in Norwegian aquaculture is *less than 0.5*% of what it was ten years ago. 10) Bangladeshi fish farmers increasingly use medicines and floating fish feed, which is *less wasteful* than the sinking kind.

Task 13. Complete the instructions with *more, the most, less, the least.*

How to save money?

Here are some guidelines how to save money:

Bus fares usually cost (1) _____ than train fares. So always take the bus. When you go to a restaurant, always choose (2) _____ expensive dish on the menu, otherwise you will always pay (3) _____ than necessary for a good meal. Spend (4) _____ time taking a shower so that you don't use (5) _____ hot water than you need. Make an effort to save (6) _____ money at every opportunity. Do (7) _____ you can. It's (8) ._____. you can do.

Task 14. Complete the sentences using the correct <u>comparative</u> form of the words below.

good clever patient sensitive bad funny

1) My new teacher makes me laugh. He's much _____than my last teacher. 2) Maisie's _____than most people. She really cares about other people's feelings. 3) Harry's _____than the other students. He got 100% in all his exams. 4) Maria's _____ at French than everybody else because she lived in Paris for a year. 5) I'm_____ than all my friends at sport. I'm always on the losing side. 6) My sister's much _____than I am. I get annoyed with people very quickly.

Task 15. Write the second sentence using the prompts, the correct superlative form and the verb be.

*Example: He **is the most talented** artist in our school.*

1) His work is great, he/talented artist in our school 2) The phone is cheap, it/expensive one in the shop 3) Cindy and her brother are very sensible, they/practical people I know 4) These are comedies, this one/funny film I've seen 5) I enjoyed my birthday, it/good one I've had 6) Jack isn't very friendly, he/sociable boy in the class

Task 16. Choose the correct word to complete the text. Find all the cases of comparison forms and constructions. Translate them into Russian.

If you were Costis Mitsotakis, you might consider yourself the world's unluckiest man. Costis was the only person in his village not to buy a ticket in the Spanish Christmas lottery. When they won first prize, everyone except Costis received a share of the total prize of nearly £600 million, so he was the [1]**poorest / most poor** person in his village that Christmas. But there are other contenders. For example, US park ranger Roy Sullivan was even unluckier [2]**as / than** Costis. He was struck by lightning seven times in his lifetime – the world record! However, that's nothing like as bad as Britain's John Lyne, who is perhaps the [3]**most / more** unfortunate of all. At eighteen months old, he accidentally drank disinfectant and had to have his stomach pumped. And the older he got, the worse things became. He's been run over, nearly drowned and had a car crash. John's life has been more accident-filled than you would think possible. But he doesn't think he's unlucky. As far as he's concerned, most of his accidents could have ended a lot more seriously, so he may actually be the world's luckiest man!

Task 17. Complete the sentences with the comparative or superlative form of the adjectives.

e.g. Shopping is *the most boring* (boring) activity in the world!

1) Who is _____ (fast) runner in the team? 2) This is _____ (big) cinema in our town. 3) Judy is a _____ (good) dancer than her brother. 4) This bag is _____ (expensive) one in the shop. 5) Mum is _____ (organised) than Dad. 6) Sue is _____ (sporty) than Tom. 7) You aren't good at music, but I'm _____ (bad) than you.

Task 18. Complete these sentences with the comparative or superlative form of an appropriate adjective from the list. You can use one of the words twice.

bad clever expensive fat good heavy high superstitious

1) She's the _____ person I've ever met. This morning, on the way to college, she refused to walk under a ladder. 2) My suitcase is _____ than yours. I can hardly lift mine. 3) That's the _____ car we've looked at so far. We couldn't possibly afford to buy it. 4) I can see much _____ now that I've cleaned my glasses. 5) I'm _____ than I was this time last year – I must go on a diet. 6) There's no doubt that she's the _____ student in the class. She always gets the _____ marks in tests. 7) I hope the weather doesn't get _____ we're going on holiday on Saturday. 8) That was the _____ film I've seen in a long time – I thought it was even _____ than this year's Oscar winner.

Learn some fish idioms!

***not the only fish in the sea –** найдутся и другие, на нем/ней свет клином не сошелся (*букв.* не единственная рыба в море)

Translate these sentences.

He said he could find other girls – she was not the only fish in the sea.

I'm pretty disappointed that I didn't get the job, but I'm trying to remind myself it's not the only fish in the sea.

***goldfish bowl** (*n.*), (*slang*), (*informal*) – аквариум для золотых рыбок; отсутствие изолированности, уединения; как на ладони; все время на людях; всюду души; как в аквариуме

Translate these sentences.

It's like living in a goldfish bowl.

Joe's office is a goldfish bowl, that's why I didn't let him kiss me there.

I feel like I'm in a goldfish bowl working at this new company, with all their security cameras posted everywhere.

***queer fish** (*n.*) – чудак, странный тип, чудила; человек с причудами

Translate these sentences.

Uncle Algernon dresses in heavy furs in the summer and short-sleeved shirts in the winter. No wonder everyone considers him a queer fish.

UNIT 5

POND CULTURE

I. Words to know before you read

a number of – ряд, некоторое количество
advantage [əd´vɑ:ntidʒ] – преимущество, плюс;
~ disadvantage – недостаток, минус
aerate [´e(ə)reit] – насыщать воздухом или кислородом
affect [ə´fect] – воздействовать (на что-л.), влиять на…
amount [ə´mɑʊnt] – количество
available (for) [ə´veil(ə)bl] – наличный, доступный, свободный
beyond [bi´jɒnd] one's control – не в чьих-л. силах, неподвластный кому
capacity [kə´pæsiti] – вместимость, объем, мощность, способность
catch (caught, caught) – (вы)ловить, поймать
compressed air – сжатый воздух
concern [kən´sɜ:n] – (*v*) касаться, иметь отношение; (*n*) предмет беспокойства, проблема, забота
convert [kɒn´vɜ:t] – обращать, превратить, трансформировать
dependent on – зависящий от
depletion [di´pli:ʃ(ə)n] – истощение (запасов), опустошение
determine [di´tɜ:min] – устанавливать, обусловливать, определять
die [dai] – умирать; die-off – вымирание
drain [drein] – выпускать , отводить (воду), осушать до дна
egret [´i:grit] – белая цапля
eliminate [i´limineit] – устранять, уничтожать
enough [i´nʌf] – достаточно
exhaustion [ig´zɔ:stʃ(ə)n] – исчерпание, истощение, обеднение (чего)
feed – корм; feed (fed, fed) on smth. – питаться чем, кормить
fence – забор
fingerlings [´fiŋgəliŋ] – фингерлинг (подросшая молодь рыб), сеголеток
fish density – плотность косяка рыб (число рыб на кубометр)
flush out – очищать напором жидкости, промывать или вымывать (сильной струей воды)
fresh water – пресная вода
growth nutrient – питательное вещество, необходимое для роста
heron [´herən] – цапля
in turn – в свою очередь
increase [in´kri:s] – увеличивать

irrigation ditch – арык, оросительная канава
juvenile [ˊʤu:vənail] fish – рыбная молодь, мальки рыб
large-scale marketing – реализация продукции в крупных масштабах
lead [li:d] (led, led) to – приводить к (чему)
market – (*v*) продавать, сбывать; (*n*) рынок (сбыта)
market size – (*рыб.*) товарный размер
natural source [sɔ:s]– естественный (природный) источник
net – сеть
otter [ɒtə] – выдра
overhead netting – накладные (верхние) сети
paddle wheel [ˊpædlwi:l]– водоподъемное колесо, колесо с лопастями
pollution [pəˊlu:ʃən] – загрязнение
pond culture – прудовое хозяйство, прудовое рыбоводство
predation [priˊdeiʃ(ə)n] – хищничество, хищническое истребление
processing [ˊprəʊsesiŋ] – переработка
release [riˊli:s] – высвобождать, выпускать, сбрасывать
requirement [riˊkwɑiəmənt] – требование, потребность
ruin [ˊru:in] – разрушать, уничтожать, губить
same [seim] – тот самый, тот же самый
supply [səˊplɑi] – (*v*) снабжать, поставлять; (*n*) снабжение, поставка
viable [ˊvɑiəb(ə)l] – жизнеспособный, разумный
waste [weist] – отходы

Task 1. Practise reading the following words and phrases. Learn them.

algae [ˊældʒi:] – водоросли; pelagic algae [peˊlæʤik ˊældʒi] – пелагические водоросли; algal bloom [ˊælgəl ˊblu:m] – цветение воды, вызванное массовым развитием водорослей; ammonia [əˊməʊniə] – аммоний, аммиак; benthic [ˊbenθik] animals – бентосные (донные, придонные) животные; crustaceans [krʌˊsteiʃənz] – ракообразные; mollusk [ˊmɑ:ləsk] – моллюск; nitrates [ˊnaitr(e)its] – нитраты; nitrites [ˊnaitraits] – нитриты; oxygen [ˊɒksiʤən] – кислород; phytoplankton [ˊfaitəʊˌplɑŋ(k)t(ə)n] – фитопланктон, растительный планктон; zooplankton [ˊzu:ə(ʊ)ˌplɑŋ(k)t(ə)n] – зоопланктон; digest [daiˊʤest] – переваривать, усваивать.

Task 2. Translate the word combinations into Russian.

a) *amount*: amount of water, amount of oxygen, amount of fish, amount of waste;

b) *predation*: bird predation, predation from birds and animals, to control predation;

c) *requirements*: low labor requirements, low energy requirements;

d) *the same*: at the same time, in the same area;

e) *fish*: to raise fish, juvenile fish, fish density, loss of fish, harvesting of the fish, marketing of the fish, large quantities of fish, fish farm, fish farmer, a constant supply of fish;

f) *net*: to use large nets, overhead netting;

g) *market*: to reach market size, large-scale marketing, marketing of the fish, marketing infrastructure;

h) *waste*: to digest waste, to eliminate waste, natural processes for waste elimination, release waste into the pond, to flush out wastes, toxic waste, waste processing cascade, amount of waste generated, to remove the wastes;

i) *pond*: the size of the pond, pond culture, pond environment, introduce fresh water to the pond, aerate the pond;

j) *algae*: pelagic algae, algal blooms, die-off of the algae;

k) *oxygen*: amount of oxygen, add oxygen to the water, increase amount of oxygen in the water, oxygen available for the fish, depletion of the oxygen.

II. Reading

Task 3. Read the text and answer the questions.

1. What factors determine the amount of fish that any given pond can produce?
2. What are the advantages of pond culture?
3. What are the disadvantages of pond culture?

The simplest system for raising fish is in ponds or irrigation ditches. Juvenile fish or fingerlings are put into a pond and fed until they reach market size. The fish are caught, either by draining the pond or by using large nets. Food can be from natural sources–commonly zooplankton feeding on pelagic algae, or benthic animals, such crustaceans and mollusks. Tilapia species feed directly on phytoplankton, making higher production possible.

There are a number of factors that determine the amount of fish that any given pond can produce. The first is the size of the pond, which determines

the amount of water available for the fish, which in turn determines the amount of oxygen available for the fish. If there are too many fish in the pond, there will not be enough oxygen, and the fish will become stressed and begin to die. Another factor is the capacity of the pond to digest waste from the fish and the uneaten feed. The waste that is toxic to fish is mostly in the form of ammonia, nitrites, and nitrates.

The pond environment provides natural ways to eliminate waste. For example, in one waste processing cascade, the initiating bacteria convert available ammonia to available nitrites, which a second bacteria converts to the available nitrates that plants and algae consume as a growth nutrient. The viable density of fish in a pond is determined by the balance between the amount of waste generated and natural processes for waste elimination. If the fish release too much waste into the pond, the natural processes cannot keep up and the fish will become stressed.

Fish density can be increased if fresh water can be introduced to the pond to flush out wastes or if the pond can be aerated, either with compressed air or mechanically by using paddle wheels. Adding oxygen to the water not only increases the amount of oxygen in the water available for the fish, it also improves the processes involved in removing the wastes.

Another factor affecting pond culture is predation from birds such as egrets and herons, and animals such as raccoons, otters, and even bears in some areas. If the pond is small, fences and *overhead netting* can control predation. When ponds are large, however, predation is very problematic. In some cases, farms have been ruined by bird predation.

Another concern is algal blooms, which can lead to an exhaustion of nutrients, followed by a die-off of the algae, depletion of the oxygen, and pollution of the water, leading to a loss of fish.

Advantages of pond culture include its simplicity, and relatively low labor requirements (apart from the harvesting of the fish). It also has low energy requirements. A major disadvantage is that the farm operation is more dependent on weather and other natural factors that are beyond the farmer's control. Another disadvantage concerns the marketing of the fish. Generally, ponds are only harvested when most of the fish are at market size. This means the farmer has many fish to market at the same time, requiring a market that can absorb large quantities of fish at a time and still give a good price to the farmer. Usually this means there is a need for some kind of pro-

cessing and large-scale marketing, with several fish farms in the same area to provide the processing plant with a constant supply of fish. If this kind of marketing infrastructure is not available, then it is difficult for the fish farmer.

III. Comprehension check

Task 4. Answer the questions about the text.

1) How long are fish kept in a pond?
2) What methods are used to catch fish in the pond?
3) What do fish feed on in pond culture?
4) Why do fish sometimes begin to die?
5) How is waste generated in the pond?
6) Why is waste elimination important for raising fish?
7) How can waste be eliminated?
8) How can pond fish be protected from predators?
9) Why are algal blooms dangerous for fish?
10) What problems can a fish farmer face when ponds are harvested?

Task 5. Match the halves of the following sentences.

1) Juvenile fish are fed	a) are toxic to fish.
2) Ammonia, nitrites and nitrates	b) as a growth nutrient.
3) There are natural processes	c) can control predation.
4) Plants and algae consume nitrates	d) for waste elimination.
5) Fresh water can be introduced to the pond	e) lead to a loss of fish
	f) to flush out wastes.
6) Fences and overhead netting	g) until they reach market size.
7) Depletion of oxygen and pollution of the water	

IV. Vocabulary building

Task 6. Divide the words and phrases in the box into the groups indicated below.

draining the pond mollusks ammonia egrets low labour requirements fences raccoons nitrites bears simplicity dependence on weather and other natural factors crustaceans using large nets otters nitrates low energy requirements need for large-scale marketing overhead netting uneaten feed herons

1) Benthic animals (2): …
2) Wastes (4): …
3) Natural predators (5): …
4) Ways to control predation (2): …
5) Methods of fish harvesting (2): …
6) Advantages of pond culture (3): …
7) Disadvantages of pond culture (2): …

Task 7. Which of these words can go together? Join them. Consult the vocabulary list and the text if necessary.

1) to digest	a) fish
2) to drain	b) large nets
3) to use	c) plankton
4) to feed on	d) predation
5) to become	e) stressed
6) to raise	f) the pond
7) to control	g) waste

WORD FORMATION

Task 8. Find the words in the text with the same root as the words in the table and translate them.

verb	noun
1) to eliminate	
2) to produce	
3) to exhaust	
4) to deplete	
5) to pollute	
6) to lose	
7) to simplify	

Now choose the proper word (verb or noun) from the table above to translate the words in brackets. Pay attention to the grammar.

1) Algal blooms can cause (*истощение*) of the oxygen. 2) Modern fishing practices threaten (*истощить*) the fishing grounds of our nations. 3) Agriculture, through the use of fertilizers and pesticides, contributes to the lake (*загрязнение*). 4) Rapid growth in human activities with the development of tourism industry, irrigation, water eutrophication and pollution seem to be important causes for (*потере*) of fish stocks and biodiversity degradation. 5) One of the benefits of pond culture is its (*простота*).

6) We have (*исчерпали*) the food supplies. 7) My yoga instructor told me to (*устранить*) all sources of stress from my life. 8) The pond environment provides natural ways of waste (*устранения*). 10) Modern agriculture (*производство*) is highly dependent on large amounts of petroleum. 11) The raising of cattle and sheep is also important, and Kazakhstan (*производит*) much wool and meat.

V. Grammar revision – The Present Simple vs. The Present Continuous

A) The Present Simple Tense

Affirmative (+)	**Negative (–)**	**Interrogative (?)**
I read	I **don't** read	**Do** I read?
You read	You **don't** read	**Do** you read?
He / She read**s**	He / She **doesn't read**	**Does** he / she **read**?
We read	We **don't** read	**Do** we read?
You read	You **don't** read	**Do** you read?
They read	They **don't** read	**Do** they read?

The Present Simple Tense is often used with the following adverbial phrases and adverbs of frequency:

always – всегда
often – часто
frequently – часто
every day /week – каждый день / каждую неделю
usually – обычно
sometimes – иногда
seldom – редко
rarely – редко
never – никогда
on Sunday(s) – в воскресенье / по воскресеньям
three times a month – три раза в месяц
twice a week – дважды в неделю
from time to time – время от времени

Task 9. Use the correct Present Simple form of the verb in brackets.

The Walkers (1) _____ (*live*) in the city of Cambridge where Oliver (2) _____ (*work*) in the City Council. When Oliver is at work one Tuesday morning, the secretary (3) _____ (*enter*) his office and (4) _____ (*inform*) him that the Mayor (5) _____ (*want*) a meeting with him personally in two day's time.

This (6)_____ (*make*) Oliver very nervous. He (7)_____ (*not think*) it's good news.

"(8)_____ you _____ (*know*) what the meeting is about?" he (9)_____ (*ask*) the secretary. She (10)_____ (*not know*). So Oliver (11)_____ (*have*) to wait and see.

Task 10. Rewrite each present simple sentence as affirmative (+), negative (–) or question (?).

e.g. My dad repairs old cars.(–) – *My dad doesn't repair old cars*.

1) Do your parents speak English? (+) 2) Sarah studies geography. (?) 3) Does Richard live in London? (–) 4) Mr Baker doesn't watch the news on TV.(+) 5) Those children don't do enough homework. (?) 6) My brother drinks fruit juice at breakfast. (–)

Task 11. Expand the following into sentences in order to make true statement with *doesn't* or *don't* where necessary.

1 water / boil / at 100 ºC – *'Water boils at 100 °C.*
2 rice / grow / on trees – *Rice doesn't grow on trees.*
3 chicks / hatch / from eggs
4 kangaroos / live / in Spain
5 plants / need / water to grow
6 rain / fall / from clouds
7 astronauts / travel / in submarines
8 cows / lay / eggs
9 pandas / live / in Italy
10 elephants / eat / meat
11 fish / walk / on land
12 the sun / set / in the east
13 bees / give milk
14 caterpillars / turn / into butterflies
15 wool / come / from sheep

B) The Present Continuous Tense

Affirmative (+)	**Negative (–)**	**Interrogative (?)**
I am reading	I **am not** reading	**Am** I reading ?
You are reading	You **are not** reading	**Are** you reading?
He / She is read**ing**	He / She **is not reading**	**Is** he / she **reading**?
We are reading	We **are not** reading	**Are** we reading?
You are reading	You **are not** reading	**Are** you reading?
They are reading	They **are not** reading	**Are** they reading?

The Present Continuous is often used with the following time expressions and phrases:

now – сейчас
at the moment – в настоящий момент
at present – сейчас, в настоящее время
these days – сейчас, сегодня, в современном мире
still – все еще, по прежнему
nowadays – в наше время, в наши дни
today – сегодня
tonight – сегодня вечером
Look! – Смотри!
Listen! – Послушай!
Don't make noise! – Не шумите!

Task 12. Complete the sentences with the Present Continuous of the verbs in brackets.

1) Please turn off the television. I_____ (try) to study for an exam. 2) We _____ (go) to bed early every day this week. 3) Sorry, I can't hear you. Someone _____ (make) a lot of noise. 4) David's in the kitchen. He _____ (get) dinner ready, so come into the garden and have a drink. 5) They aren't here at the moment. They _____ (have) lunch I think. 6) He _____ (do) a lot of training for the marathon. 7) ___ someone _____ (live) in that house? 8) That ice cream looks delicious. I _____ (die) to try some!

Task 13. Choose the correct options.

1) I'm leaving the office *now* / *often* so I'll be home in twenty minutes.
2) *Currently* / *Once a year* we celebrate Independence Day.
3) What are you doing *today* / *often*?
4) Where does Rowena come from *now* / *originally*?
5) They aren't answering the phone *right now / always.*
6) We visit the gardens in the park *always* / *every weekend.*
7) You need to get a new passport *every* / *once* five years.
8) We visit my grandparents *always* / *once a week.*

Task 14. Complete the article about an internet businessman. Use the *present simple* or *present continuous forms* of the verbs in brackets.

A day in the life of Simon Nixon of **www.moneysupermarket.com**

I normally [1]_____ (get up) at seven o'clock, but this week I [2]_____ (start) work earlier because it's a busy period. I [3]_____ (usually arrive) at work by nine and I[4]_____.(check) my emails. Today, I [5]_____. (work) on reports on our websites because these tell me how many people [6]_____. (currently visit) our websites. For example, we [7]_____ (have) about six million visitors every month and this number [8]_____ (increase). We [9]_____ (also make) a lot of improvements to our sites at the moment. The internet business is very competitive and it [10]_____.(get) harder to stay at the top.

Task 15. Read the text and put the verbs in brackets into the *present simple* or the *present continuous*.

Michael McIntosh *is* (be) a politician. He 1) ___ (be) a very busy man.

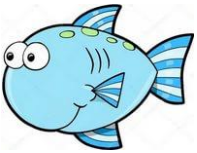
Every morning, he 2)_____ (leave) home at 8 o'clock, and 3)_____ (go) to his office. He 4)_____ (usually/have) meetings until lunchtime, and in the afternoon, he 5)_____ (often/visit) the people of Madewell. He really 6) _____ (enjoy) talking to people.

At the moment, he and his team 7) _____ (organise) his election campaign. There are elections in June and he 8) _____ (hope) to persuade lots of people to vote for him.

Next month, he 9) _____ (go) to London to meet the Prime Minister. They 10) _____ (have) a meeting to discuss future plans for Madewell.

Learn some fish idioms!

* **have other fish to fry** (*informal*) – иметь другие дела, иметь дела поважнее, (*букв*. иметь другую рыбу для жаренья)



Translate these sentences.

They wanted John to be the secretary, but he had other fish to fry.

Mary was invited to the party but she refused because she had other fish to fry.

UNIT 6

CAGE CULTURE

I. Words to know before you read

absorb [əb´zɔ:b] – поглощать, впитывать, абсорбировать
acceptable [ək´septəbl] – приемлемый, допустимый
achieve [ə´tʃi:v] – достигать, добиться (чего)
allow for [ə´laʊ] – создавать возможность, допускать, позволять
body of water (water body) – водоем, водный объект
cage [keiʤ] – садок (для рыбы)
cage culture – садковое рыбоводство
confine [kən´fain] – ограничивать, заключать в…
cultivate [´kʌltiveit] – выращивать, разводить
density [´densiti] – плотность, густота, скопление, кучность
determine [di´tɜ:min] – определить, решить, установить
digest [dai´ʤest] – (*зд.*) перерабатывать
estuary [´estʃʊ(ə)ri] – устье реки
expectation [ˌekspek´teiʃ(ə)n] – ожидание, надежда, расчет
floods [flʌdz] – наводнения, паводок, половодье
grower [´grəʊə] – (*зд.*) производитель, фермер
growth potential – возможности дальнейшего развития
harvest [´ha:vist] – (*n*) вылов, добыча; (*v*) вылавливать
labor (labour BrE) [´leibə] – рабочая сила, рабочие
maintain [mein´tein] – поддерживать, сохранять
market – (*v*) продавать, сбывать
occur [ə´kɜ:] – случаться, происходить, возникать, появляться
pass to – переходить к.., поступать в…
place – (*v*) поместить, расположить
profitable [´prɔfitəb(ə)l] – рентабельный, выгодный
proper [´prɔpə] – надлежащий, правильный, должный
provide [prə´vaid] – обеспечить, гарантировать, позволять
provide protection from – обеспечить защиту от
receive [ri´si:v] – принимать
remove [ri´mu:v] – очищать, устранить, удалить
several [´sev(ə)rəl] – несколько
vulnerable [´vʌln(ə)rəb(ə)l] – легко повреждаемый, незащищенный

Task 1. Practise reading the following words and phrases. Learn them.

Aquatic organisms [ə´kwætik ´ɔ:gəniz(ə)mz] – водные организмы; natural process [´nætʃ(ə)rəl ´prəʊsəs] – естественный процесс; the number of – число, количество (чего); amount of [ə´maʊnt] – величина, количество, содержание (чего); quality [´kwɔliti] – качество; quantity [´kwɒntiti] – количество, величина; multiple [´mʌltip(ə)l] harvests – (*зд.*) многократный вылов; have control over – осуществлять контроль над; production [prə´dʌkʃ(ə)n] – производительность; command a better price – продаваться по более высокой цене; in some cases – в отдельных случаях, в ряде случаев; marketing options [´ɒpʃ(ə)nz] – варианты сбыта продукции.

Task 2. Match the words with their meaning, then translate the sentences below paying attention to the words in italics.

1) still	a) в свою очередь
2) too	b) всё еще
3) whether [´weðə]	c) слишком
4) so long as	d) ли
5) however [haʊ´evə]	e) обычно, как правило, в общем
6) in turn	f) однако
7) therefore [´ðeəfɔ:]	g) поэтому
8) generally [´ʤen(ə)rəli]	h) при условии, что; пока; если

1) According to the UN, billions of people *still* live without an address. 2) The problem of pollution always occurs when *too* many fish are put in *too* little water, *whether* it is in a pond or a cage or several cages placed together in a larger water body. 3) *So long as* the proper balance is maintained, *however*, pollution is not a problem. 4) The farmer may be able to market his fish to local restaurants or fresh fish markets and *therefore* be able to command a better price for his fish. 5) This *in turn* limits the growth potential of the farm.

II. Reading

Task 3. Read the text and answer the questions.

1. What water bodies can cages be placed?
2. Why does the problem of pollution always occur in cage culture?
3. What is the main task of the grower in cage-based aquaculture?

Cage-based aquaculture cultivates aquatic organisms by confining them in a cage within a body of water, which could be a pond, a river, or an estuary.

In cage culture, the waste from the organisms and food they don't eat is passed to the receiving body of water with the expectation that natural processes will remove the waste from the water. In such systems, the grower needs achieve a balance between the density of aquatic organisms in each cage and the number of cages in the body of water and the amount of waste the body of water can absorb and still maintain acceptable water quality. The problem of pollution always occurs when too many fish are put in too little water, whether it is in a pond or a cage or several cages placed together in a larger water body. So long as the proper balance is maintained, however, pollution is not a problem. The farmer must then determine if that balance will provide enough production to be profitable.

An advantage of the cage culture is that the farmer has more control over the fish and multiple harvests are possible with less labor. This allows for more marketing options when smaller quantities of fish are harvested over longer periods of time. For example, the farmer may be able to market his fish to local restaurants or fresh fish markets and therefore be able to command a better price for his fish. Another advantage is that the cages generally provide protection from most predators.

The major disadvantage of pond culture is that the amount of fish the farm can produce is limited by the amount of waste the receiving water can absorb and digest. This in turn limits the growth potential of the farm. Another

disadvantage is that the cages are vulnerable to storms, floods, and in some cases, winter ice.

III. Comprehension check

Task 4. Answer the questions about the text.

What are the advantages of cage culture?
What are the disadvantages of cage culture?

Task 5. Match the halves of the sentences.

1) In cage culture fish cages are placed	a) are water bodies.
2) Ponds, rivers, estuaries	b) from most predators.
3) The waste from the organisms and food they don't eat	c) has more control over the fish.
4) Natural processes can remove	d) in a body of water.
5) The problem of pollution always occurs	e) is passed to the receiving body of water.
6) In cage-based aquaculture the farmer	f) storms, floods, and winter ice.
7) The cages generally provide protection	g) the waste from the water.
8) Cages are vulnerable to	h) when too many fish are put into too little water.

IV. Vocabulary building

Task 6. Match the word combinations with their Russian equivalents.

1) complete diet	a) водопой для скота
2) manufactured diet	b) дополнительный доход
3) practical experience	c) естественный корм
4) existing pond	d) любительское рыболовство
5) supplemental income	e) опыт практической работы
6) financial investment	f) полноценный рацион
7) stock watering	g) искусственный рацион
8) recreational fishing	h) растворенный кислород
9) dissolved oxygen	i) уже существующий пруд
10) natural food	j) финансовые инвестиции

Task 7. Fill in the gaps with the appropriate words from the list above.

1) Caged fish will get no natural food and so depend on the _____ for all essential nutrition.

2) A farmer could try producing fish in an _____ or other water body with minimal financial or environmental risk

3) Localized water quality problems, particularly low _____ , are common in cage culture.

4) Growing fish in cages can be a means for landowners with existing ponds to produce fish for _____ .

5) The confinement of fish in cages should not hinder other uses of the water resource, such as _____ , boating, swimming, irrigation or livestock watering.

6) In cases where the fish has limited or no access to other nutrient sources, such as in heavily stocked pond cultures or in artificial culture systems (cages, raceways and the like), all of the essential nutrients must be provided in the prepared diet in adequate quantities. Such _____ are being used more frequently in catfish culture ponds because fish density has been steadily increasing in recent years and dietary deficiencies such as the broken backs syndrome have been observed in pond culture.

Task 8. Fill in the gaps with words or phrases from the box.

water quality	interested	predators	cages	disease	lakes
fishing	investment	income	harvesting	aquaculture	natural food

Growing Fish in Cages

Many landowners who are 1)_____ in aquaculture may not have the financial and physical resources or the practical experience to start a large-scale aquaculture operation. Growing fish in 2)_____ can be a means for landowners with existing ponds to produce fish for supplemental 3)_____ and to gain experience in aquaculture. Cage culture is an intensive form of 4)_____ that has its own set of advantages and disadvantages that should be carefully considered before making an investment.

The advantages of cage culture.

- Many water resources can potentially be used, including ponds, 5)_____, strip pits, rivers, and streams.
- Cage culture requires a relatively small financial 6)_____.
- Feeding, sampling, observation, and 7) _____ are all comparatively simple.

• The pond or water resource can still be used for other activities like stock watering or recreational 8) _____.

Disadvantages of cage culture.

• The fish are crowded in cages, and there is a relatively high incidence of 9) _____ that can spread rapidly.

• There can be localized poor 10) _____, such as low dissolved oxygen, in and around cages.

• Caged fish do not have access to 11) _____, so a nutritionally complete diet is required.

• Cages can be attractive to 12) _____, vandals, and poachers.

WORD FORMATION

Прилагательные с суффиксом -able (-ible), напр., *acceptable (приемлемый, допустимый), profitable (прибыльный), vulnerable (уязвимый),* имеют широкое распространение в современном английском языке. Суффикс -able (-ible) в современном английском языке обладает исключительной продуктивностью. С его помощью прилагательные образуются от глаголов и существительных.

Task 9. Read the words in the first column. Match them with the related words in the second column. Translate the adjectives into Russian. Pay attention to their suffixes.

1) value	a) valuable
2) break	b) reasonable
3) convert	c) breakable
4) reason	d) favourable
5) forget	e) fashionable
6) avail	f) agreeable
7) wash	g) available
8) fashion	h) washable
9) agree	i) convertible
10) favour	j) (un)forgettable

Task 10. Fill in the gaps with the right adjectives from Task 9.

1) The gloves are machine _____. Stuffed toys that cannot be washed should be removed or replaced with _____ toys.

2) Windows, for example, are very _____ , but I wouldn't fancy living in a world without them.

3) I have a real weakness for _____ clothes.

4) A smart appearance makes a _____ impression at an interview. The disease spreads quickly under _____ conditions.

5) The only _____ explanation seems to be that the pod is from some extinct species of plant.

6) A visit to Morocco is a truly _____ experience.

7) Highly _____fish species have been discovered in the seas around the coast of Vietnam. Most commercially _____ species of fish are being ruthlessly over-exploited.

8) A sum of 400 million roubles a year must be paid in _____ currencies. Ice is _____ into water.

9) What food is _____ is frequently contaminated because of pollution and unhygienic conditions. Fish are the most resource-efficient animal protein _____ to humankind, aside from insects.

10) He's a very _____ young man.

V. Grammar revision – The Past Simple

Time expressions used with the Past Simple:

yesterday – вчера
then – тогда
just now – только что, сию минуту, только сейчас
the day before yesterday – позавчера
the other day – на днях (о прошлом)
last night / week / month / year / century – вчера вечером / на прошлой неделе / в прошлом году / в прошлом веке
two days / a week ago – два дня / неделю назад
in 1980 – в 1980 году

A) The Past Simple of regular verbs is formed by adding -ed.

Affirmative (+)	Negative (–)	Interrogative (?)
I stayed	I did not (didn't) stay	Did I stay?
You stayed	You didn't stay	Did you stay?
He/she/it stayed	He/she/it didn't stay	Did he/she/it stay?
We stayed	We didn't stay	Did we stay?
You stayed	You didn't stay	Did you stay?
They stayed	They didn't stay	Did they stay?

Task 11. Write the Past Simple of the following verbs.

a) open, love, plan, empty, regret, quarrel, try, die, cry, fry, smoke;
b) arrive, close, help, want, hurry, look, watch, clean, cook, play;
c) regret, rob, visit, add, push, start, live, end, wait, count, like;

d) travel, tidy, laugh, finish, kiss, post, change, open, walk, revise;
e) ask, answer, translate, talk, last, smile, pollute, invite, form, return.

Task 12. Transform the sentences according to the model.

Model: *We discuss a lot of issues at our English lessons / yesterday. —*
*We **discussed** a lot of issues at our English lesson **yesterday**.*

1. I usually walk to the Academy / yesterday. 2. He regularly answers my letters / last week. 3. The shop opens at nine / last year. 4. We always stay at this hotel / three years ago. 5. My working day lasts four hours / last year. 6. My brother always returns home from work at six / yesterday. 7. The Smiths live in Cambridge / in 2005. 8. The students always revise their grammar rules before every test / last term. 9. I often translate articles from English into Russian / the other day. 10. He travels abroad every summer / last summer. 11. They usually finish their work at five / yesterday. 12. He plays chess very well / as a child. 13. He wants to talk to you / yesterday. 14. You often lie to me / when I asked you about it. 15. She always smiles at me / when she saw me.

B) Irregular verbs have a special past form.

Affirmative (+)	Negative (–)	Interrogative (?)
I went	I did not (didn't) go	Did I go?
You went	You didn't go	Did you go?
He/she/it went	He/she/it didn't go	Did he/she/it go?
We went	We didn't go	Did we go?
You went	You didn't go	Did you go?
They went	They didn't go	Did they go?

Task 13. Look at the list of irregular verbs at the end of the book and write the Past Simple of the following verbs.

a) be, come, become, have, take, steal, forget, drink, put, make, can;
b) cut, find, run, tell, begin, do, leave, shine, hear, write, say, feel;
c) get, see, hold, meet, catch, teach, bring, pay, be, make, spread;
d) break, grow, buy, build, choose, cost, drive, eat, fall, feed, breed;
e) fly, do, freeze, go, give, hide, keep, know, lead, swim, take.

Task 14. Fill in the gaps with the Past Simple of the correct verbs from the list.

put up cook go make take collect drink meet speak play feel sing

Last weekend I 1) *went* camping with my friends. We 2)___ tents and

sleeping bags. Three of us 3) ___ the tents while the others 4) ___ wood and 5) ___ a fire. We 6) ___ potatoes and 7) ___ Coke. In the evening, Tom 8) ___ the guitar and everybody 9)___ songs. We 10) ___ some French tourists and 11) ___ to them in French. At about midnight, we all 12) ___ sleepy, so we 13) ____ to bed.

Task 15. Rewrite these sentences as special questions.

1) We went for a walk in the evening yesterday.
When *did you go for a walk yesterday*?
2) My friend visited Westminster Abbey in July. *What* _____ ?
3) My mother baked two cakes for my birthday party. *How many*_____*?*
4) I am reading an adventure story now. *What kind of*_____ ?
5) My teacher told us about London last month. *What* _____ *?*
6) Nick is fond of travelling. *What* _____ *?*
7) They have got a country house not far from St. Petersburg. *Where* ____ ?
8) My sister goes to school five times a week. *How often* _____ ?

Task 16. Put the verbs in brackets in the correct tense.

1) He often *brings* (bring) me flowers. 2) _____ (you / meet) Paul yesterday? 3) Father _____ (work) in the garden now. 4) What _____ (you / do) at the moment? 5) Mr Jones _____ (paint) his house last month. 6) She _____ (go) to school on foot every day. 7) It_____ (be) hot yesterday. 8) The baby _____ (not / sleep) now. 9) He never _____ (drive) fast. 10) She _____ (leave) Paris in 1987.

Task 17. Complete the dialogues with the Past Simple of the verbs in brackets.

1) **A:** I_____(phone) you yesterday evening, but you_____(not / be) home. _____your mother_____(tell) you?
B: No, she probably _____ (forget) all about it.
A: I also _____. (try) to call you on your mobile phone, but with no luck.
B: Actually, I_____(not / have) it with me. What ___ you____(want) to tell me?
A: I ___ (need) you to fix my laptop. Can you please come now to take a look?
B: OK, I'm coming in half an hour.

2) **A:** What ___ you ___ (do) yesterday afternoon?
B: Not much. I _____ (stay) home and ____ (relax) a bit. I_____ (do) some reading and_____ (sleep) for an hour or so.

A: I guess you _____ (need) some rest after all that work, didn't you?

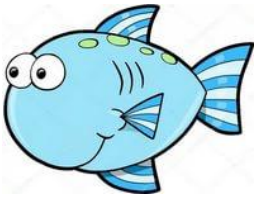
3) **A:** _____ the children_____ (have) a good time at the circus?
B: Yes, they_____ (say) it_____ (be) fantastic. They really _____ (love) the acrobats and the jugglers.

4) **A:** _____ you_____ (go) bowling on Friday evening?
. **B:** No, we___ (watch) a documentary at Stan's house but we____ (not / like) it all. We all ____ (find) it rather boring.

5) **A:** Where _____ the Walkers _____(spend) their holiday last summer?
B: They _____ (travel) to Peru. They _____ (visit) amazing sights and _____ (take) lots of photos.
A: Lucky them! I bet it _____ (be) a really exciting trip. I'd love to travel to Peru, too.

Learn some fish idioms!

* **fish or cut bait** – сделать выбор, не откладывая в долгий ящик; принять то или иное решение



Translate these sentences.

Jack couldn't decide whether to go to college or get a job, so his father told him to fish or cut bait.

Buy the kind of ice cream you want or give someone else in line a chance. Fish or cut bait!

* **fish in muddy / troubled waters –** стараться получить что-либо (выгоду, информацию) нечестным путем; «ловить рыбку в мутной воде»

Translate these sentences

I hate people fishing in troubled waters in order to gather information.

Frank is fishing in troubled waters by buying more shares of that company. They are supposed to be in financial difficulties. The company could make more money by selling armaments abroad, but they would be fishing in troubled waters.

UNIT 7

FLOW-THROUGH SYSTEM

I. Words to know before you read

allow for – создавать возможность для, позволять осуществить
as with – как и в случае с, по аналогии с
contaminate [kən´tæmineit] – загрязнять, портить
cost [kɒst] – стоимость
diverted river – река с измененным руслом, отклоненная река
downstream – нижнее течение реки, нисходящий поток
enter the system – поступать (входить) в систему
fish density – плотность косяка рыб (число рыб на кубометр)
flow rate – скорость струи, мощность потока
flow-through system – прямоточная система водоснабжения
flush out – вымывать, промывать, очищать струей жидкости
grade [greid] – (*зд.*) сортировать
handling – обращение с кем/чем, уход за кем/чем
involve [in´vɒlv] – включать в себя, предусматривать
maintain – сохранять, поддерживать, обеспечивать
marketing position – положение на рынке
movement [´mu:vmənt] – движение, перемещение
parasite [´pærəsait] – паразит
pump [pʌmp] – подавать воду насосом, накачивать насосом
purity [´pjʊ(ə)riti] – чистота, отсутствие примесей
raceway – проточный канал (для разведения рыбы), рыбоходный канал
raceway system – система каналов
receiving body of water – водоприемник
require [ri´kwaiə] – испытывать необходимость в, требовать
spring – родник, источник
stream [stri:m] – река, речка, ручей
sufficient [sə´fiʃ(ə)nt] – достаточный
tank – бассейн, резервуар
well – колодец
well water – вода из подземного источника, колодезная вода

Task 1. Practise reading the following words and phrases. Learn them.

Parasite [ˊpærəsait] – паразит; purity [ˊpjʊ(ə)riti] – чистота, отсутствие примесей; diverted [daiˊvɜ:tid] river – перехваченная (отклоненная) река; require [riˊkwaiə] – испытывать необходимость в чем-л., требовать; quality [ˊkwɒliti] – качество; instead of [inˊsted] – вместо, взамен; while [wail] – в то время как, пока; in many cases – во многих случаях.

Task 2. Translate into Russian the following word combinations.

a) flow-through system, cage system, well water, water purity, optimum fish density, flow rate, water quality;

b) simple system, sufficient amount, clean water, better control, major disadvantage, large amount, the receiving water, clean water, acceptable water quality;

c) movement of water, a series of raceways, downstream of diverted river, a sufficient amount of clean water, the cost of pumping, the large amount of water, the amount of waste.

II. Reading

Task 3. Read the text and answer the questions.

1. What are the benefits of the flow-through system?
2. What are the drawbacks of the flow-through system?

Raceways at a West Virginia fish hatchery

A flow-through system involves the movement of water through a series of raceways or tanks. The waste is flushed out of the system into a receiving body of water. In many cases, the raceways or tanks may simply be downstream of a diverted river or stream. This can be a simple system if there is a sufficient amount of clean water entering the system.

The raceways or tanks give better control of the feeding and allow for better handling of the fish. It also is easier to grade or sort the fish by size. As with the cage system, the raceways make it possible to harvest and market fish over a longer period of time, which improves the farmer's marketing position. Some farms have pumped well water instead of using streams

or springs. The advantage of pumping from wells is that water purity can be controlled more easily and there is less chance for disease and parasites contaminating the fish.

The major disadvantage of the flow-through system is the cost of pumping the large amount of water that is required. The optimum fish density for this system is limited by the flow rate of clean water and the amount of waste the receiving water can absorb while maintaining acceptable water quality.

Flow-through raceway system in Masis, Armenia

III. Comprehension check

Task 4. Read the text again and answer the questions.

1) How is the flow-through aquaculture system different from the pond and the cage culture?

2) How is the problem of waste solved in the flow-through system?

3) Why can the flow-through system improve the farmer's marketing position?

4) What is the advantage of pumping well water instead of stream or spring water?

5) What is the optimum fish density for the flow-through system limited by?

Task 5. Match the halves of the sentences.

1) A raceway farm for freshwater fin fish usually has	a) are commonly cultured in raceways.
2) Freshwater species such as trout, catfish and tilapia	b) built from polyester resin.
3) Water sources for raceway aquaculture operations are	c) can be removed by pumps.
4) Most raceways are made of	d) reinforced concrete.
5) Raceway tanks can also be	e) high to flush out metabolic wastes.
6) The water flow rate in a raceway system needs to be sufficiently	f) to provide the required level of water quality
	g) usually streams, springs, reservoirs or deep wells.

7) Solid wastes which accumulate at the raceway bottom	h) a dozen or more parallel raceway strips build alongside each other.
8) A continuous water flow-through is maintained	

IV. Vocabulary building

Task 6. Match the word combinations with their Russian equivalents.

1) flow-through system	a) армированный бетон, железобетон
2) receiving body of water	b) вода из подземного источника
3) diverted river	c) водоприемник
4) well water	d) источник водоснабжения / воды
5) water purity	e) качество воды
6) plastic liner /lining	f) ключевая / родниковая вода
7) flow rate	g) мощность потока, скорость струи
8) water quality	h) пластмассовое покрытие
9) fish hatchery	i) подача воды, водоснабжение
10) water supply	j) проточная система
11) water source	k) резервное / запасное водоснабжение
12) spring water	l) река с измененным руслом
13) backup water supply	m) рыбзавод, рыбный питомник
14) reinforced concrete	n) чистота воды

Task 7. Fill in the gaps with words and phrases from the box.

water quality aquaculture water sources strong flow raceway systems reinforced concrete water supply spring water plastic liners consists of

Raceway, also known as a **flow-through system**, is an artificial channel used in 1) _____ to culture aquatic organisms. 2) _____ are among the earliest methods used for inland aquaculture. A raceway usually 3)_____ rectangular basins or canals constructed of concrete and equipped with an inlet and outlet. A continuous water flow-through is maintained to provide the required level of 4) _____ , which allows animals to be cultured at higher densities within the raceway.

Freshwater species such as *trout*, *catfish* and *tilapia* are commonly cultured in raceways. Raceways are also used for some marine species which need a constant water flow, such as juvenile *salmon*, brackish water *sea bass* and *sea bream* and marine invertebrates such as *abalone* ([ˌæbəˈləʊni] – морское ушко).

The most important factor to consider when selecting a site for a raceway farm is the water supply. 5) _____ for raceway aquaculture operations are usually streams, springs, reservoirs or deep wells. *Trout* do best in 6)_____ because it keeps a constant temperature, while *catfish* need a 7)_____, about 80 litres per second for every 0.4 hectares of raceway. A backup water supply should be positioned so, if the 8) _____ or pump fails, it can flow by gravity into the start of the raceway.

Most raceways are made of 9) _____ , though some earthen raceways are also built. Earthen raceways with 10) _____ cost little and are easy to build, but cleaning and disinfecting them is difficult and plastic linings are fragile. Reinforced concrete is more expensive, but is durable and can be shaped in complex ways. Raceway tanks can also be built from polyester resin. These tanks have smooth walls, and are mobile and easy to service. However, their cost limits them to small sizes, under 5 cubic metres.

Task 8. Match the adjectives (A) with nouns (B) to make collocations used in the article above. Translate them into Russian.

A	B
1) artificial	a) basin
2) rectangular	b) channel
3) high	c) concrete
4) marine	d) density
5) brackish	e) factor
6) important	f) raceways
7) constant	g) species
8) earthen	h) temperature
9) reinforced	i) walls
10) smooth	j) water

Task 9. Read the paragraph below and find the English equivalents of the following words.

1) мальки рыбы (сформировавшиеся из личинок рыбки)
2) молодь рыб (от 2,5 см до размера годовичка)
3) рыба, ловимая с катера рыболовами-спортсменами
4) перевозить на грузовиках
5) кормовые гранулы
6) бетонный резервуар / бассейн
7) зарыблять

Classic fry farming

This is also called a "Flow through system" Trout and other sport fish are often raised from eggs to fry or fingerlings and then trucked to streams and released. Normally, the fry are raised in long, shallow concrete tanks, fed with fresh stream water. The fry receive commercial fish food in pellets. This method is pretty simple and has been used for many years to stock streams with sport fish.

WORD FORMATION

Конверсия – один из основных продуктивных способов пополнения словарного состава современного английского языка. При этом способе словообразования новое слово производится без изменения основной формы исходного слова и без применения каких-либо словообразовательных средств. Вопрос о том, какой частью речи является слово, решается на основе его формальных и синтаксических признаков, например: *water* – (*n*) вода; (*v*) поливать; (*adj*) водный.

Rice grows in *water*. – Рис растет в *воде*.

We need *to water* the lawn. – Нам нужно *полить* газон.

Opportunities for *water transport*, tourism, and trade will increase. – Возможности для (развития) *водного транспорта*, туризма и торговли возрастут.

Task 10. Translate the sentences into Russian paying attention to the words in italics.

1) Did you catch any *fish*? Dad really likes *to fish*. *A fish aquarium* can be a good choice for a hamster cage.

2) His father was in *trade*. The company *trades* in silk, tea, and other items. UK firms are operating in Korea under EU *free trade agreement*. A U.S. *trade delegation* arrived in Beijing for key talks over tariffs.

3) He will travel *by ship*. Coal *is shipped* by rail. The suppliers *ship* their product all over the world. He's just *a ship engineer*.

4) If your staff is happy then *the work* will be done easily. He hates *to work*. The foreigners on *work visas* are paid one-third less than the going US wage.

5) You refuse to *help* and then criticize me for not doing it right? He made many personal sacrifices to provide *help* to the city's homeless people.

6) *The market* is active. They plan *to market* the toy for children aged 2 to 6. *The market price* is very high right now.

7) When I happen *to catch* a fish I set it free at once, because I do fishing just for pleasure. Dad brought back his prize *catch*, a three-foot striped bass. Every retail chain in America has its *catch phrases* and slogans.

V. Grammar revision – The Present Perfect

Time words and expressions used with the Present Perfect:

How long (как долго) – *How long* have you known him?
for (в течение) – I've known him *for five years* / *for a long time*.
since (с) – I haven't talked to her *since* last Sunday.
lately/recently (недавно) – Have you seen any god films *lately/recently*?
already (уже) – We have *already* seen this film.
yet (еще не , уже) – We *haven't seen* this film *yet*. Has he left *yet*?
just (только что) – I have *just* phoned him.
always (всегда) – She has *always* loved animals.
ever (когда-либо) – Have you *ever* been abroad?
never (никогда) – She has *never* been abroad.
so far (пока, на данный момент) – I have sent 20 invitations *so far*.

Affirmative (+)	Negative (–)	Interrogative (?)
I have been	**I have not / haven't been**	**Have I been?**
You have been	**You have not / haven't been**	**Have you been?**
He/she/it has been	**He/she/it has not / hasn't been**	**Has he/she/it been?**
We have been	**We have not / haven't been**	**Have we been?**
You have been	**You have not / haven't been**	**Have you been?**
They have been	**They have not / haven't been**	**Have they been?**

Task 11. These verbs are irregular. Complete the table with the correct forms of the verbs.

Verb	The Past Simple (V_2)	Participle II (V_3)	Translation
cut			резать, рубить
put		put	
read		read [red]	
feel	felt		
bring	brought		
make			делать
build	built		
tell		told	
find	found		
hear	heard		слышать
see	saw		

Task 12. Make similar tables for the following verbs.

a) have, change, be, go, buy, get, invite, speak, say, save, sleep, smell;
b) take, open, become, drive, learn, start, be, fall, visit, break, wake;
c) rise, raise, be, receive, know, flow, cost, catch, sell, write, think ;
d) grow, feed, teach, increase, begin, steal, choose, come, draw, fly;
e) drink, eat, forget, freeze, give, leave, lend, meet, run, send, swim.

Task 13. Fill in the blanks with time expressions from the box.

so far how long just for since how long ago ….yet this week ago just now already

1.They got married a month *ago.*
2. He hasn't called us _____ .
3. I've had this car _____ a year
4. He has _____ left.
5. She's typed three letters _____ .
6.She's _____ cooked dinner
7. _____ have you been in Rome?
8. The boss came _____ .
9. Carol has been to the cinema twice _____ .
10. _____ did he move house?
11. I've studied Maths _____ 1991.
12. Peter has been here _____ 5 o'clock.

Task 14. Complete the sentences with the time words in brackets. Tick (√) the right position.

1) I have □ packed the things for our holiday □ . (*already*)
2) The manager hasn't □ arrived □ . (*yet*).
3) Mr Rain has □ called □ . (*just*).
4) Has Oliver □ paid the bill □ (*yet*)?
5) Jessica has □ written a postcard to Granny □ (*tonight*).
6) Have you □ been to Scotland □ (*ever*)?
7) They have □ swum in the ocean □ (*never*).
8) Have you □ bought any new records □ (*recently*)?
9) I haven't □ eaten anything □ (*today*).
10) Have you □ been at the theatre □ (*lately*)?

Task 15. Read the scenarios and choose the correct options.

1. Bruno invited Nina to the cinema to see a science fiction film he was interested in. Nina didn't go with him because she'd seen the film with her sister.

a Nina has already seen the film.
b Nina hasn't seen the film yet.

2. Greg wants to buy a new tablet but he doesn't have enough money for it.

a Greg hasn't saved the money yet.

b Greg has already saved the money.

3. I got a text from my brother asking me to phone our dad. But two minutes before I received the text, I was speaking to my dad on the phone!

a I've just spoken to my dad.

b I haven't spoken to my dad yet.

4. The assistant is offering us coffee but we'd both had one on our way to the meeting.

a We haven't had coffee yet.

b We've just had coffee.

5. Zoe got a new smartphone but it's still in the box. She says she'll open it tomorrow.

a Zoe has already used her new phone.

b Zoe hasn't used her new phone yet.

6. Liam ordered a new camera online. A week later he changed his mind and tried to cancel the order, but the company said it had been shipped a few days before.

a The camera has already been shipped.

b The camera has just been shipped

Task 16. Complete these sentences with the Present Perfect form of the verbs in parentheses and with since or for.

Skateboarding 1) *has been* popular 2) *for* more than 50 years. Skateboards 3) ___ (*to be*) around 4) ___ the 1930s. The first ones were simple wooden boxes on metal wheels. They 5) ___ (*to change*) a lot 6) ___ then!

The first skateboarding contest took place in California in 1963.7) ___ then, thousands of contests 8) ___ (*to take*) place all over the world.

In 1976, the first outdoor skate park opened in Florida. 9) ___ then, hundreds of parks 10) ___ (*to open*) in countries around the world.

Skateboarding can be dangerous. 11) ___ last year, more than 15,600 people in the United States alone 12) ___ (*to go*) to hospital emergency rooms because of injuries.

When he was seven years old, Jon Comer lost his right foot as a result of a car accident. But that didn't stop him.13) ___ then, he 14) ___ (*to become*) one of the IB best-known professional skateboarders in the world.

Tony Hawk 15) ___ professionally___ (*not to compete*) 16) ___ many years, but he is still the most famous and successful skateboarder in the world.

Task 17. **Put the verbs into the Present Simple, Present Perfect or Past Simple.**

Nigel Hurricane 1) *drives* (drive) racing cars. This year he 2) _____ (come) first in eight races so far and 3)_____ (win) the World Championship. He 4) _____ (learn) to drive in 1989 and 5) _____ (start) to race fast cars ten years later. He 6) _____ (earn) a lot of money and he 7) _____ (become) very famous. He now 8) _____ (live) in America. He 9) _____ (get) married three years ago and he 10) _____ (have) two children.

Task 18. Put the verbs in brackets into the Past Simple or Present Perfect.

I love winter sports. 1) *I've been* (be) ice-skating many times. When I was younger I 2) _____ (go) to an ice-rink with my school. I 3) _____ (fall) over a lot and I 4) _____ (can/not) skate very well, but I really 5) _____ (enjoy) it. Then last year I 6) _____ (visit) Austria and 7) _____ (skate) at an outdoor rink there. I 8) _____ (also/play) ice hockey. I 9) _____ (never/ski) though. I 10) _____ (go) on holiday to Switzerland last month to go skiing, but on the first day I 11) _____ (slip) on some ice and 12) _____ (break) my ankle, so I 13) _____ (can/not) ski at all.

Learn some fish idioms!

* **fish story –** безбожное вранье, небылица, выдумка, преувеличение, охотничьи рассказы

Translate these sentences.

He came up with some fish story about his winnings at the track.

You know how boys and men always have a fish story or two to tell.

UNIT 8

RECIRCULATING SYSTEM

I. Words to know before you read

amino acid composition – аминокислотный состав
animal husbandry – животноводство
approve [ə´pru:v] – одобрять, допускать к применению
at a constant rate – с постоянной скоростью
capital cost – капитальные затраты, капитальная стоимость
cause [kɔ:z] – быть причиной, вызывать, провоцировать
compressed air – сжатый воздух
confine [kən´fain] – ограничивать, локализовать
consume [kən´sju:m] – потреблять, съедать
contaminate [kən´tæmineit] – загрязнять, портить
drum filter – барабанный фильтр
dump – сбрасывать
durable [´dju(ə)rəbl] – износоустойчивый, с большим сроком службы
energy cost – затраты на энергоресурсы
fish lice [lais] – морские рыбьи вши, калигиды
gills [´gilz] – жабры
grading – сортировка
intensify [in´tensifai] – усиливать, активизировать
intestinal worm – глист, кишечный червь / гельминт
manage [´mænidʒ] – (*зд.*) регулировать, контролировать, управлять
mean (*v*) – значить, означать, подразумевать
means – средство / средства
pad filter – микросито
plastic beads [bi:dz] – пластмассовые шайбы
prevent – предотвратить
purge [´pɜ:dʒ] – очищать
recirculating (aquaculture) system (RAS) – установка замкнутого водоснабжения (УЗВ); замкнутая рыбоводная система
recirculation system – система замкнутого водоснабжения (УЗВ)
recycling system [ri´saikliŋ ´sistəm] – система рециркуляции
rotating screen – вращающееся сито
run the system – управлять системой
settling tank – резервуар-отстойник, осадочный бассейн
shredded plastic – пластмассовый заполнитель (измельченный пластик)

solid waste – твердые отходы
space – пространство
surface [ˊsɜ:fis] – поверхность
surface area – суммарная поверхность
treat fish disease – лечить болезни рыб
treat parasites / the water – подвергать обработке паразитов / воду
treatment – обработка, лечение
year round production – круглогодичное производство

Task 1. Practise reading the following words and phrases. Learn them.

oxygen [ˊɒksiʤən] – кислород;
liquid oxygen [ˊlikwidˊɒksiʤən] – жидкий кислород;
filter [ˊfiltə] – фильтр;
mechanical filter [miˊkænik(ə)lˊfiltə] – механический фильтр;
biological filter [ˊbaiəˊlɔʤik(ə)lˊfiltə] – биологический фильтр;
ammonia [əˊməʊniə] – аммиак;
nitrite [ˊnaitrait] – нитрит;
chemicals [ˊkemik(ə)lz] – химикаты;
bacteria [bækˊti(ə)riə] – бактерии, микробы;
protein [ˊprəʊti:n] – белок;
parasite [ˊpærəsait] – паразит;
fungi [ˊfʌŋgi] – грибок;
pathogens [ˊpæθəʤən] – болезнетворный организм, патоген;
protozoa [ˊprəʊtəˊzəʊə] – простейшие животные организмы, одноклеточные животные организмы, протозоа;
virus [ˊvai(ə)rəs] – вирус, возбудитель инфекционной болезни;
ultraviolet light [ˊʌltrəˊvaiəlitˊlait] – ультрафиолетовый свет;
ozone [ˊəʊzəʊn] – озон;
expertise [ˊekspɜ:ˊti:z] – специальные знания, профессионализм

Task 2. Match the English words with their Russian equivalents.

1) as well as	a) а не
2) because of	b) а также
3) in order to	c) из-за
4) rather than	d) с использованием, через посредство
5) via [ˊvaiə]	e) чтобы

Task 3. Fill in the gaps with the right words from Task 2.

1) I chose to learn German _____ French. 2) My flight was canceled _____ the storm. 3) Plants need light _____ survive. 4) Eliot wrote plays _____ poetry. 5) I sent a message to Kitty _____ her sister.

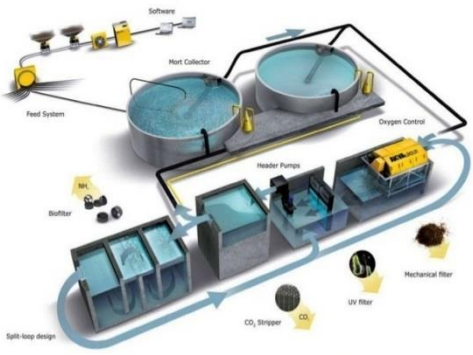
Task 4. Translate into Russian the following sentences from the text. Pay attention to the words in italics.

1) A recirculating system *means* that the aquatic organisms are grown in raceways or tanks and the waste is then removed from the water and the water *re-used*. 2) Other *means* to treat the water are being tried, including ultraviolet light and ozone. 3) The surface area is usually *shredded plastic*, *plastic rings*, or *plastic beads*. 4) *Plastic* is usually used because it is *durable* and can be cleaned and *re-used*. 5) *The more surface area, the more bacteria* and *the more bacteria, the more waste* that can be removed.

II. Reading

Task 5. Read the text quickly and find the following. Use a dictionary to check any words you don't know.

1) two problems common to the pond, cage and flow-through systems;
2) two methods of adding oxygen to the water;
3) two types of filters used in recirculating systems;
4) two chemicals that are particularly toxic to fish;
5) five things the farmer can manage better in recirculating systems.



Recirculating Aquaculture System (RAS)

Two problems common to the pond, cage, and flow-through systems are that they all require a large amount of clean water, and the environment must absorb a large amount of waste. Since the 1960s, much research and experimentation has been done on recirculating systems.

A recirculating system means that the aquatic organisms are grown in race-

ways or tanks and the waste is then removed from the water and the water re-used. Oxygen is added to the water at a constant rate by using compressed air or liquid oxygen, or via other methods. The recycling system uses natural processes to remove the waste, but confines and intensifies the processes in order to get more waste removed in less time and using less space. Mechanical filters such as settling tanks, pad filters, or rotating screens called drum filters remove the solid waste. Another type of filter is the biological filter. This filter removes ammonia and nitrite from the water, which come from the fish body waste. These two chemicals are particularly toxic to fish. The filter uses bacteria to digest the ammonia and nitrite, with the bacteria growing on surfaces inside the filter. The surface area is critical to the efficiency of the filter. The more surface area, the more bacteria and the more bacteria, the more waste that can be removed. The surface area is usually shredded plastic, plastic rings, or plastic beads. Plastic is usually used because it is durable and can be cleaned and re-used.

The major advantage in this system is that large numbers of aquatic organisms can be raised in very little space and using a small amount of water. Another advantage is that the farmer can manage the organisms, the water quality, the water temperature, the feed rations, and the grading much more closely, especially if the tanks are in a building. This allows the farmer to plan for year round production, which is a strong marketing advantage. It also solves the predation problem and weather related problems. The problem of waste removal is easier to manage with a closed system. The waste can be totally removed from the system and spread on land as fertilizer, rather than dumped into a receiving body of water.

A major disadvantage to recirculation systems is the capital cost to construct the system. A system that can produce 100,000 pounds of fish a year can cost up to US$500,000, not including the land or buildings. Another major problem is the energy cost to run the system, as well as the higher cost of fish food, which must contain a much higher level of protein (up to 60 percent) than, for example, cattle food, and a balanced amino acid composition as well.

A third area of concern is disease and parasites because of the ease in which pathogens can invade the fish body (e.g. by the gills). Once a system is infected, it is very difficult to purge the system. Most chemicals that will kill bacteria, viruses, and parasites will also kill fish, or will contaminate them and cause a problem when they are consumed. Salt can be effective in treating parasites in freshwater fish and there are a few other chemicals that are approved for use in treating fish disease. The best way is to prevent an infection by keeping the tanks and equipment clean and by being careful about introducing new organisms from other farms into the system. Other means to treat the water are being tried, including ultraviolet light and ozone. These treatments can be effective, but they are very expensive. This type of aquaculture requires tight monitoring and a high level of expertise.

III. Comprehension check

Task 6. Read the article again and answer the questions.

1. What does a recirculating system (RAS) mean?
2. How is waste removed from RAS?
3. What kind of waste is removed with the help of mechanical filters?
4. What kind of waste does biological filter remove?
5. Why is surface area of the biological filter critical to the efficiency of the filter?
6. Why is shredded plastic used in the biological filter?
7. What is the major advantage of RAS?
8. What kinds of problems are solved in RAS?
9. What are the disadvantages of recirculating systems?
10. Why is risk of infections much higher in RAS?
11. What can cause infections in RAS?
12. Why is it difficult to purge the system if it is infected?
13. What can be used to treat parasites in freshwater fish?
14. What is the best way to prevent an infection in RAS?
15. What other means of water treatment can be effective in RAS?

Task 7. Decide if the statements are true (T) or false (F)?

1. Mechanical filters remove ammonia and nitrite from the water.
2. Shredded plastic is used in the biological filter.
3. Recirculation aquaculture system requires a large amount of water.
4. The waste from the recirculating system can be used as fertilizer.
5. Recirculating systems are much more expensive to construct than pond, cage or flow-through systems.

6. Fish food for RAS system must contain more than 50% of protein.

7. The risk of infections by parasites is much higher in animal husbandry than in recirculation systems.

IV. Vocabulary building

Task 8. Read the text again and find the English equivalents for the following collocations.

1) Чистая вода; 2) исследовательские и экспериментальные работы; 3) сжатый воздух; 4) равномерно, с постоянной скоростью; 5) пластмассовые кольца; 6) пластмассовые шайбы; 7) большое количество водных организмов; 8) кормовой рацион; 9) проблема с хищниками; 10) удаление отходов; 11) пресноводная рыба; 12) строгий контроль; 13) высокий уровень профессионализма.

Task 9. Translate into Russian.

1) Fish body; 2) fish body waste; 3) solid waste; 4) toxic to fish; 5) efficiency of the filter; 6) very little space; 7) a small amount of water; 8) water quality; 9) water temperature; 10) weather related problems; 11) a closed system; 12) fish food; 13) cattle food; 14) fish density; 15) animal husbandry; 16) fish disease.

Task 10. Choose the right alternative.

1) Recirculation Aquaculture System are *indoor / outdoor* land-based fish farms. 2) The mechanical filtration removes *solids / viruses and parasites* efficiently. 3) The biofilter helps remove metabolic-by products like *intestinal worms / ammonia*. 4) The purpose of the water processing is to remove waste and add *nitrite / oxygen* before it is re-used in the tanks. 5) The water in the tanks is renewed *frequently / rarely*; usually every few hours. 6) Recirculating Aquaculture Systems are *closed /open* systems. 7) When fish densities are high, the risk of infections by parasites is *much higher /lower* than in animal husbandry. 8) Such methods of water treatment as ultraviolet light and ozone are *rather cheap / very expensive*. 9) A major *advantage / disadvantage* to recirculation systems is the capital cost to construct the system. 10) The problem of waste removal is *easier / more difficult* to handle with a closed system. 11) *Protein / Salt* can be effective in treating parasites in freshwater. 12) Ammonia and nitrite are *toxic / non-toxic* to fish.

Task 11. Fill in the gaps with the words from the box.

waste materials	raceway systems	traditional method
uneaten feed	controlled environment	grown in RAS
rears	clean water	fast growth	farm fish

RAS DEFINED

Recirculating aquaculture systems (RAS) represent a new and unique way to 1) _____. Instead of the 2) _____ of growing fish outdoors in open ponds and raceways, this system 3) _____ fish at high densities , in indoor tanks with a 4) _____ . Recirculating systems filter and clean the water for recycling back through fish culture tanks. New water is added to the tanks only to make up for splash out and evaporation and for that used to flush out 5) _____ . In contrast, many 6) _____ used to grow trout are termed "open" or "flow through" systems because all the water makes only one pass through the tank and then is discarded. Fish 7) _____ must be supplied with all the conditions necessary for the fish to remain healthy and grow. They need a continuous supply of 8) _____ at a temperature and dissolved oxygen content that is optimum for growth. A filtering (biofilter) system is necessary to purify the water and remove or detoxify harmful waste products and 9) _____. The fish must be fed a nutritionally-complete feed on a daily basis to encourage 10) _____ and high survival.

WORD FORMATION

Глаголы в современном английском языке образуются от основ существительных и прилагательных с помощью следующих суффиксов и префиксов:

a) **-ise (-ize),** e.g. *apology – apologize /ise* (извиняться), *memory – memorize / ise* (запомиать), *legal – legalize / ise* (легализовать);

b) **-ify (-fy)**, e.g. *just – justify* (оправдывать), *simple – simplify* (упрощать), *glory – glorify* (прославлять);

c) **-ate**, e.g. *active – activate* (активировать), *regular – regulate* (регулировать), *vaccine – vaccinate* (делать прививку);

d) **-en**, e.g. *deep – deepen* (углублять), *sharp – sharpen* (заострять), *threat – threaten* (угрожать);

e) **en-** , e.g. *large – enlarge* (увеличивать), *rich – enrich* (обогащать);

Task 12. Find in the texts of this unit the necessary derivatives to complete the table.

Verb	Noun	Adjective	Adverb
?	intensity	intensive	intensively
?	purity	pure	purely
?	toxin toxicity	?	toxically
systemize	?	systemic systematic systematical	systematically
?	contamination contaminant	contaminated contaminating	–
?	courage	courageous	courageously

Task 13. Fill in the gaps with the right words from the table above.

1) We _____ the water by boiling it.

2) Avocado helps our liver _____ and does an amazing job at removing toxins from our body.

3) Warm weather _____ plant growth. We want to _____ students to read more.

4) They produce lots of toxins, called mycotoxins, which can _____ our food.

5) It may _____ the conflict between them.

6) The question here was how we can _____ all this information and give it to the player.

V. Grammar revision – The Passive Voice

Formation of the Passive Voice

Be + V_3 (=Participle II)

	Active Voice	Passive Voice
Simple	**I ask.** – Я спрашиваю. **He asks.** – Он спрашивает. **They ask .**– Они спрашивают. **He asked.** – Он спросил. **We asked.** – Мы спросили. **They will ask.** – Они спросят.	**I am asked.** – Меня спрашивают. **He is asked.** – Его спрашивают. **They are asked.** – Их спрашивают. **He was asked.** – Его спросили / спрашивали. **We were asked.** – Нас спросили. **They will be asked.** – Их спросят .

Continuous	**It is building.** – Он строит. **They are building.** – Они строят. **It was building.** – Он строил. **They were building.** – Они строили.	**It is being built.**– Он строится. **They are being built.** – Они строятся. **It was being built.** – Он строился. **They were being built.** – Они строились. / Их строили.
Perfect	**I have shown.** – Я уже показал. **He has shown.** – Он уже показал. **They have shown.** **I had shown.** **They had shown.** **They will have shown.**	**I have been shown.** – Мне уже показали. **He has been shown.** – Ему уже показали. **They have been shown.** – Им уже показали. **I had been shown.** **They had been shown.** **They will have been shown.** – Им покажут.
Modals + Infinitive	**He has to deliver the letters.** Он вынужден доставлять письма. **He may deliver the letters.** Он может доставлять письма. **He must deliver the letters.** Он должен доставлять письма.	**The letters have to be delivered.** Письма приходится доставлять. **The letters may be delivered.** Письма могут доставляться. **The letters must be delivered.** Письма должны доставляться.

Task 14. Match the verbs in italics (A) with the tenses (B).

A	B
1) Various drugs *are* regularly *used* in aquaculture to prevent diseases and increase production.	
2) A record volume of antibiotics *was registered* in 2014.	Present Simple Passive
3) Environmental impact of large salmon farms *has been studied* extensively.	
4) The fish that *are* currently *being farmed*, albeit on a small scale for research purposes, *are marketed.*	Past Simple Passive
5) In modern times polyculture *is being recognised* as key to sustainable aquaculture.	Future Simple Passive
6) The stage *is being set* for an aquacultural revolution.	
7) The quality of the water *should be* constantly *monitored and adjusted* for **pH** and numerous other factors, including oxygen content.	Present Continuous Passive

8) Many types of freshwater fin fish *are raised* in pond systems.	Present Perfect Passive
9) Norway, a country celebrated for its seafood, is currently in the process of building Europe's first underwater restaurant. The entrance to the restaurant *will be located* three meters above the sea level.	Modal + Passive Infinitive
10) Cod fry do not have large yolks that they can live off in the early days of their lives. They *must be fed*, and fed correctly, almost as soon as they *have been hatched.*	

Task 15. Identify the tenses in the sentences below. Translate the sentences into Russian.

1) Excessive use of antibiotics is observed in Chilean aquaculture of salmon. Salmonidae[1] is not endemic[2] to this country, they are exotic fish brought from other regions and they are bred in small cages with a high density. 900,000 tonnes of salmon are farmed in Chilean fjords, located close to each other, so there is a high probability of infection between different fishponds.

2) The state leases[3] water areas for a period of 25 years with the possibility of extension[4]. At present, 1,412 such areas are being leased in Chile, although not all of them operate simultaneously[5]. Salmon breeding farms are located on these sites.

3) The salmon stocks[6] have been ravaged[7] by algae belonging to the *Chrysochromulina* family. While wild salmon are less affected by the bloom[8] as they are free to swim to less smitten[9] areas. A similar mass death of salmon was experienced in 1991.

4) Europe's first underwater restaurant, opened in Norway, is called "Under", which also means "wonder" in Norwegian. In the restaurant a large dining area that sits about 40 guests is walled by a gigantic transparent[10] window to the ocean. Artificial lights will be used to guide the fish and their prey near the viewing window. Seals[11] are not being encouraged near the restaurant as they tend to scare away[12] the fish. Fish will be on the menu, as will seabirds, and wild sheep that have grazed the archipelago nearby will also be prepared for the evening meals.

5) Most seafood production currently in aquaculture is carried out in protected bays and inshore waters. The Negev Desert in Israel has a rainfall of <100mm per annum and seems an unlikely place to find aquaculture, however, since the early 1980s fish have been farmed here.

6) In Florida, Ocean Boy Farms claims to be able to produce a marine shrimp that does not pollute the environment. Their inland shrimp farm uses another fish, the tilapia, to mop up[13] the shrimps' waste. A similar technique is being tried[14] by a farm at Mikhmoret, Israel.

Notes

[1] Salmonidae – лососевые
[2] endemic [en´demic] – эндемичный, аборигенный, местный
[3] lease [li:s] – сдавать в аренду
[4] extension – продление
[5] simultaneously [sim(ə)l´teiniəsli] – одновременно
[6] stock – запас
[7] ravage [´rævidʒ] – разорять, опустошать
[8] bloom [blu:m] – цветение (водорослей)
[9] smitten [smit(ə)n] – пораженный, загрязненный
[10] transparent [træs´pærənt] – прозрачный, светопроницаемый
[11] seal [si:l] – тюлень
[12] scare away – отпугнуть, распугать
[13] mop up – ликвидировать, уничтожать
[14] try [trai] – испытывать, испробовать

Task 16. Rewrite these sentences in the Passive. Start each sentence with the underlined word.

A

1) Kenya produces Arabic coffee. – *Arabic coffee **is produced** in Kenya*.
2) Small farmers grow most of the coffee beans.
3) Whole families pick the ripe beans.
4) The factories process and dry the beans.

B

5) They built the bridge in 1996. – *The bridge **was built** in 1996*.
6) A famous journalist wrote this book.
7) They took the injured people to hospital.

C

8) They will deliver the letter tomorrow. – *The letter **will be delivered** tomorrow*.
9) They will redecorate the room soon.
10) They will sell the tickets on the day of the performance.

D

11) They have cancelled our train. – *Our train **has been cancelled**.*
12) Someone has broken the window.
13) They have increased petrol prices.

Task 17. Put the words in brackets in order to form questions.

Example: Where is my bicycle? It is gone. – (stolen / it / been / has?)
– *Has it been stolen?*

1. There was a fight at the disco last night. – (*injured / anybody / was*?)
2. Last night somebody broke into our shop. – (*anything / was / taken*?)

3. This hotel is rather expensive. – (*breakfast / is / included*?)
4. Have you heard the terrible news? The president is dead! – (*he /killed /has / been*?)
5. The room looks different. – (*it / been / has / redecorated*?)

Task 18. Put the verbs in brackets into the correct Active or Passive tense.

Tea **1**) *is made* (make) from the leaves of the tea plant. At first it **2**) _____ (use) as a medicine, but it **3**) _____ (become) an everyday drink in the 3rd century AD. First, the leaves **4**) _____ (pick) from the plant and they are spread onto a cloth. They **5**) _____ (leave) there for up to twenty hours. Next, the leaves are rolled up until they **6**) _____ (break) into small pieces. Finally, the leaves **7**) _____ (dry). The tea **8**) _____ (pack) into containers and sent to different countries. It **9**) _____ (sell) to customers as loose leaves, as tea bags and as instant tea. To make tea, we **10**) _____ (boil) water and **11**) _____ (pour) it over the dry tea in a teapot. This **12**) _____ (leave) for three to five minutes. We can then add milk, lemon or sugar. In Britain, it was the custom to serve tea in the afternoons with sandwiches and cakes This custom **13**) _____ (start) by the Duchess of Bedford around 1840. Today people **14**) _____ (drink) tea all over the world.

Learn some fish idioms!

***small fry –** 1) дети, ребятишки; 2) мелкая сошка, мелкота, мелюзга

Translate these sentences

This show is not suitable for small fry.

She was one of the youngest members in the Dance Club after all, small fry and unimportant.

***like shooting fish in a barrel –** проще пареной репы, проще простого

Translate these sentences.

Setting up a computer nowadays is like shooting fish in a barrel.

The chess competition was like shooting fish in a barrel. It was very easy to win.

UNIT 9

AQUAPONICS

I. Words to know before you read

acid [ˊæsid] – кислота
bases – (*зд.*) щелочи
biofilm [ˊbaiəʊˊfilm] – биопленка
break (broke, broken) down – расщеплять (вещество)
by-product [ˊbai˛prɒdəkt] – продукт пищеварения, побочный продукт
capture [ˊkæptʃə] – захватывать, улавливать
combine [kəmˊbain] – объединять, сочетать
conventional [kənˊvenʃ(ə)nəl] – обычный, традиционный
convert [kənˊvɜːt] – превращать
crayfish [ˊkreiˊfiʃ] – рак, речной рак, лангуст
creature [ˊkriːtʃə] – создание, творение, живое существо
depend on [diˊpend] – зависеть от (чего)
detached [diˊtætʃt] – отдельный, оторванный, отделенный
effluent [ˊefluənt] – сток, жидкие отходы
eliminate the need for – устранить необходимость в (чем)
essential [iˊsenʃ(ə)l] – необходимый
excess [ikˊses] – излишний, избыточный
excretion [iksˊkriːʃ(ə)n] – выделения, экскременты
feed (fed, fed) I – кормить
feed (fed, fed) II – подавать, снабжать, накачивать
fine [ˊfain] – мелкий
fixed film – фиксированная пленка
live [laiv] – живой
maintain [meinˊtein] – поддерживать, сохранять
nitrification [ˊnaitrifiˊkeiʃ(ə)n] – нитрификация (биохимическое окисление азота аммония до нитратов анаэробными бактериями)
nitrifying (nitrification) bacteria – азотовыделяющие / нитрифицирующие бактерии
nutrient [ˊnjutriənt] – питательное вещество
oxygenation [ɔkˊsiʤəˊneiʃ(ə)n] – обогащение / насыщение кислородом
particulate [pɑːˊtikjʊlət] – частица
prawn [prɔːn] – креветка
prevent from [priˊvənt] – препятствовать, мешать
pump [pʌmp] – накачивать, нагнетать

rearing tank – выростной бассейн / резервуар
refer to [ri´fɜ:] – (*зд.*) означать
responsible for – ответственный за
result from – получаться в результате, быть результатом (чего)
separate [´sep(ə)rit] – отдельный
settle out – выпадать в осадок, осаждаться, осаждать
settling basin – отстойник, отстойной бассейн
snail [sneil] – улитка
sophistication [sə´fisti´keiʃ(ə)n] – сложность
sump [sʌmp] – водосборный колодец, отстойник
supporting medium [sə´pɔ:tiŋ´mi:diəm] – подложка, опорная среда, поддерживающая среда
usable [´ju:zəb(ə)l] – пригодный для использования

Task 1. Match the English and Russian adverbs.

initially usually subsequently primarily directly successfully

1) Ketchup is (*в основном, главным образом*) made from tomatoes. 2) My friend (*сначала*) wanted to go to medical school. 3) She (*впоследствии*) went to the University of Chester and studied Commercial Music Production. 4) The girl was sitting (*прямо*) opposite him. 5) Women (*обычно*) live longer than men. 6) They (*успешно*) avoided each other for days.

Task 2. Practise reading the following international words. Give their Russian equivalents.

Aquaponics [ˈækwəˈpɒnɪks]; hydroponics [´haidrə(ʊ)´pɒniks]; aquatic [ə´kwætik]; symbiotic [ˌsimbi´ɒtic]; to accumulate [ə´kju:mjuleit]; toxicity [tɒk´sisiti]; nitrite [´naitrait]; nitrate [´naitr(e)it]; to neutralize [´nju:trəlaiz]; to utilize [´ju:tilaiz]; gravel [´grævəl]; biofiltration [´baiəʊ´filtreiʃ(ə)n]; oxygenation [ɔk´sidʒə´neiʃ(ə)n].

Task 3. Translate the following collocations.

1) Conventional aquaculture, 2) normal aquaculture, 3) aquatic animals, 4) aquatic creatures, 5) aquatic effluents, 6) symbiotic environment, 7) uneaten feed, 8) high concentration, 9) closed-system recirculation, 10) effluent-rich water, 11) solid wastes, 12) fine particulates, 13) detached biofilms, 14) excess nutrients, 15) separate biofilter, 16) several components, 17) typical components, 18) live components.

II. Reading

Task 4. Read the text quickly and answer the questions.

1. What two parts does the aquaponics system usually consist of?
2. What makes it possible for the aquaponics systems to do without a separate biofilter?
3. What live components does successful work of the aquaponics system depend on?

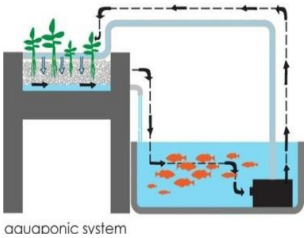
Aquaponics refers to any system that combines conventional aquaculture (raising aquatic animals such as snails, fish, crayfish or prawns in tanks) with hydroponics (cultivating plants in water) in a symbiotic environment. In normal aquaculture, excretions from the animals being raised can accumulate in the water, increasing toxicity. In an aquaponic system, water from an aquaculture system is fed to a hydroponic system where the by-products are broken down by nitrifying bacteria initially into nitrites and subsequently into nitrates that are utilized by the plants as nutrients. Then, the water is recirculated back to the aquaculture system.

Aquaponics consists of two main parts, with the aquaculture part for raising aquatic animals and the hydroponics part for growing plants. Aquatic effluents, resulting from uneaten feed or raising animals like fish, accumulate in water due to the closed-system recirculation of most aquaculture systems. The effluent-rich water becomes toxic to the aquatic animal in high concentrations but this contains nutrients essential for plant growth. Although consisting primarily of these two parts, aquaponics systems are usually grouped into several components or subsystems responsible for the effective removal of solid wastes, for adding bases to neutralize acids, or for maintaining water oxygenation. Typical components include:

- *Rearing tank*: the tanks for raising and feeding the fish;
- *Settling basin*: a unit for catching uneaten food and detached biofilms, and for settling out fine particulates;
- *Biofilter*: a place where the nitrification bacteria can grow and convert ammonia into nitrates, which are usable by the plants;

• *Hydroponics subsystem*: the portion of the system where plants are grown by absorbing excess nutrients from the water;

• *Sump*: the lowest point in the system where the water flows to and from which it is pumped back to the rearing tanks.


aquaponic system

Depending on the sophistication and cost of the aquaponics system, the units for solids removal, biofiltration, and/or the hydroponics subsystem may be combined into one unit or subsystem, which prevents the water from flowing directly from the aquaculture part of the system to the hydroponics part. By utilizing gravel or sand as plant supporting medium, solids are captured and the medium has enough surface area for fixed-film nitrification. The ability to combine biofiltration and hydroponics allows for aquaponic system in many cases to eliminate the need for an expensive, separate biofilter.

An aquaponic system depends on different live components to work successfully. The three main live components are plants, fish (or other aquatic creatures) and bacteria.

III. Comprehension check

Task 5. Decide if the statements are true (T) or false (F)?

1) Conventional aquaculture refers to cultivating plants in water.
2) Snails, fish, crayfish and prawns are aquatic animals.
3) Water in aquaculture systems becomes toxic because of excretions from the animals and due to uneaten feed.
4) Effluent-rich water is toxic to the plants cultivated in the hydroponics system.
5) Plants grown in the hydroponics system absorb excess nutrients from the water.
6) Gravel or sand are often used as plant-supporting medium.

Task 6. Read the article again and answer the questions.

1. What accumulates in the water of the aquaculture system?
2. Where is the water from the aquaculture system fed to?
3. What happens to the toxic substances in the hydroponic system?
4. What live components help to break down the by-products?
5. What do the plants utilize as nutrients?

6. Why do aquatic effluents accumulate in water?

7. What makes the effluent-rich water dangerous to the aquatic animals?

8. Why is effluent-rich water good for plant growth?

9. In what part of the aquaponic system is the fish raised and fed?

10. What units of the aquaponic system are responsible for the effective removal of solid wastes?

11. In what component of the aquaponic system is ammonia converted into nitrates?

12. What is the basic function of the sump?

13. What role does gravel (or sand) play in the aquaponic system?

14. What is the advantage of combining biofiltration and hydroponics?

IV. Vocabulary building

Task 7. Find the synonyms from the article to the words and phrases below.

1) Traditional, 2) rearing 3) reservoir, basin, 4) growing, 5) surroundings, 6) faeces, 7) collect, 8) harmfulness, 9) poisonous, 10) elimination, eradication, 11) complexity.

Task 8. Match the halves of the sentences.

1) Aquaponic systems combine	a) plants in one closed-loop system.
2) Aquaponics provides a solution	b) are converted by denitrifying bacteria.
3) The fish grown in a freshwater tank secrete wastes	c) as a biofilter for the fish waste water.
4) These waste compounds can be used	d) as an organic fertilizer for plants.
5) The nutrients, largely in the form of ammonia,	e) recirculating aquaculture and hydroponics.
6) The hydroponic bed and its crops serve	f) through urine and through their gills into their surrounding tank water.
7) Aquaponics allows for the growth of fish and	g) to the main issues these two systems face.

Task 9. Translate the following collocations.

1) Growing method**,** 2) rainbow trout, 3) food production, 4) mineral-enriched water, 5) plant farming, 6) recirculating system, 7) plant nutrition, 8) aquaculture effluent, 9) waste metabolites, 10) direct uptake, 11) horticulture farming, 12) back garden.

Task 10. Fill in the gaps with the words and phrases from the box.

traditional	rainbow trout	growing method	plant farming	per cent
chemicals	bees	food production	nitrification	plant nutrition

GREENS FED ON RAINBOW WASTE

Hydroponics, as the name suggests, is a 1)_____ based on use of mineral-enriched water, whereas aquaponics takes matters a step further, bringing together fish and 2) _____ in one recirculating system.

At Bioaqua Farm at Blackford in Somerset – the largest integrated aquaponic farm in Europe – vegetables are grown and 3) _____ reared together in organic symbiosis, without 4) _____or pesticides, but with the help of 5) _____ and worms.

The fish provide most of the 6) _____, by way of aquaculture effluent. In turn, fish waste metabolites are removed by 7) _____ and direct uptake by plants, with the suitably treated water then flowing back to the fish. In all, it is claimed this virtuous circle of reciprocity requires up to 95 8) _____ less water than 9) _____ horticulture farming.

For sustainable 10) _____ and agriculture, the aquaponics ecosystem principles also appear attractively scalable, from back gardens to commercial facilities.

WORD FORMATION

Словосложение – важное средство пополнения словарного состава английского языка. Сложное слово (a compound word) состоит из двух или более полнозначных основ, которые могут употребляться в языке самостоятельно, как свободные формы: *handshake* (hand+shake) – рукопожатие, *dustproof* (dust+proof) – пыленепроницаемый.

Сложные слова в английском языке могут писаться слитно, через дефис или раздельно: *headmaster*, *head-master*, *head master*. Таким способом могут быть образованы все части речи: существительные (*bedroom* – спальня, *birthday* – день рождения, *by-products* – побочные продукты, отходы), глаголы (*blackmail* – шантажировать, *broadcast* – транслировать), прилагательные (*effluent-rich* – насыщенный жидкими отходами, *mineral-rich* – богатый минералами), наречия (*nowhere* – нигде), местоимения (*everyone* – все, *nothing* – ничего.)

Task 11. Read and translate the following compound nouns.

1) Heart attack, 2) greenhouse effect, 3) luxury goods, 3) pedestrian crossing, 4) contact lens, 5) package holiday, 6) food poisoning, 7) mother

tongue, 8) birth control, 9) roadworks, 10) human rights, 11) arms race, 12) alarm clock, 13) pocket money, 14) hay fever, 15) blood donor, 16) blood pressure, 17) data processing, 18) generation gap, 19) sunglasses, 20) labour force, 21) windscreen wiper, 22) brain drain.

Task 12. Match the words on the left with their definitions on the right.

1) a baby sitter	a) your first language
2) a traffic jam	b) money you pay on your salary
3) a box office	c) an office where you buy tickets for trains
4) mother tongue	d) an office where you buy tickets for cinemas
5) income tax	e) a person who patrols streets to make sure you are not parked in the wrong place illegally
6) handcuffs	f) a knife for opening tins
7) greenhouse effect	g) a person who looks after children when their parents are out
8) ticket office	h) a long line of cars which move slowly because the road is busy
9) a traffic warden	i) it is caused by hair sprays and old fridges
10) a tin opener	j) every policeman has them

V. Grammar revision – Infinitive & Infinitive Constructions

A) Forms of the Infinitive

	Active Voice	Passive Voice
Indefinite	**to V** I'd like to write a letter. Я бы хотел написать письмо.	**to be + V_3** He wanted to be asked about it. – Он хотел, чтобы его спросили об этом.
Continuous	**to be + Ving** He pretended to be reading a letter. – Он делал вид, что читает письмо.	–
Perfect	**to have + V_3** He pretended to have written the letter. – Он сделал вид, что уже написал письмо.	**to have + been + V_3** He is happy to have been invited to the party. – Он рад, что его пригласили на вечер.
Perfect Continuous	**to have + been + Ving** He pretended to have been writing this letter all day. – Он притворился, что писал это письмо весь день.	–

Инфинитив в предложении может быть

a) *подлежащим*: *To understand* this author is not easy. (*Понять* этого автора нелегко.);

b) *обстоятельством цели и следствия*: He has gone to England (in order) *to perfect* his knowledge of English. (Он поехал в Англию *для того, чтобы совершенствовать* свои знания английского языка.);

c) *определением*: It was the first theatre *to be opened* in England. (Это был первый театр, *открытый / который был открыт /* в Англии.);

d) *дополнением*: We *arranged to meet* at six. (Мы *договорились встретиться* в шесть.);

e) может *входить как составная часть в сказуемое* – именное и глагольное: To help him *is to help* all of us. (*Помочь* ему – *значит помочь* всем нам.).

Task 13. Find the infinitive in the following sentences. Translate these sentences paying attention to the function of the infinitive.

1) The principal goal of aquaculture science is to develop systems by which aquatic organisms can be grown and harvested at high but sustainable rates. 2) Mariculture is the aquaculture variant in which seawater is used to cultivate desired aquatic life forms for harvest. 3) Another beauty of growing food in an aquaponics system is that it's impossible to cheat and use chemicals or synthetic fertilizers or pesticides. 4) Therefore this system is one of the most organic and natural ways to grow food. 5) The fish you choose to include in your tank will depend on whether you want to harvest the fish, or have ornamental freshwater fish. If you want to raise fish to eat, the most common choice is Tilapia. 6) The wastewater, for example, may be used to raise vegetables and other cash crops. 7) The cost to produce food from aquaculture is less than the cost of many forms of terrestrial food production, such as cattle and pork farms.

Remember: The bare infinitive (infinitive without '*to*') is used

a) after modal verbs (***can***, ***may***, ***must***, ***should***, etc.):
You ***must study*** hard. – Вы должны много заниматься.

b) after the verbs ***let*** , ***make, dare***:
They ***made*** him ***pay*** for the damage. – Они заставили его заплатить за ущерб. (But: He ***was made to pay*** for the damage.) ***Don't*** even ***dare think*** about it. – Не смей и думать об этом.

c) after the expressions ***would rather***, ***would sooner*** (предпочел бы, предпочитать), ***had better*** (лучше бы, следовало бы):

I ***would rather go*** home now. – Я бы охотнее пошел домой сейчас. You ***had better sign*** the contract. – Вам бы лучше подписать контракт.

Task 14. Insert '*to*' where necessary.

1) Geremy is learning ___ play the guitar, but he can't ___ play the piano. 2) We arranged ___ meet at six. I'm afraid I'm going ___ be late. May I ___ use your phone to make a call? 3) We didn't manage ___ find this tiny station. These nice people helped us ___ find the way. 4) Why don't you let me ___.help you, aunt Anne? I always help my mother ___ clean the house. 5) The schoolchildren wanted __ talk to the headmaster, but they didn't dare __ enter his office. 6) Jeremy couldn't ___ solve the problem, but he hoped that Jessica would be able .___ do it. 7) Maria's parents let her ___have a party, but they made her ___ tidy the living room up after the party.

Task 15. Paraphrase the following as in the example.

Example: He has a lot of books which he can read.
He has a lot of ***books to read***.

1) I would like to offer you the dress which you can buy. 2) Have you chosen the project of the house which you will build? 3) Is there something which you can show us? 4) Here is a man who will do this work. 5) Could you give me a book which I can read? 6) Jack's brought us a new film which we can see. 7) They have a lot of work which they must finish in time. 8) She has a little time in which she will tell you everything. 9) Here is an interesting physical process which we can study. 10) Mother bought a lot of fruit which we can eat. 11) You can put on the coat which will warm you. 12) Our teacher gives us many rules which we must learn. 13) Can you give me a pen which I can write with? 14) Here are some proposals which we have to discuss. 15) Has she typed the documents which I will sign?

Task 16. Paraphrase the following as in the example.

Example: He is so busy that he can't answer your call.
He is ***too busy to answer*** your call.

1) She is so weak that she can't go out. 2) They will be so busy that they will not meet you at the station. 3) This cat is so fat that it can't catch a mouse. 4) The game was so boring that we didn't want to play it. 5) The weather is so hot that we will not leave the house. 6) That bar was so dirty

that nobody wanted to eat there. 7) The water is so cold that I don't want to swim in the river. 8) He is so stupid that he can't learn a single thing. 9) She had very little money and she couldn't buy that dress. 10) Her dress is so dirty that she can't wash it up.

B) The Complex Object

После следующих глаголов и выражений инфинитив употребляется с частицей **to**: ***to want, I'd like, to expect, to know, to like, to hate***, etc.

На русский язык Complex Object, как правило, переводится дополнительным придаточным предложением с союзами *что*, *чтобы*, *как*,

e.g.: I want **you to close** the window. – *Я* хочу, чтобы ты закрыл окно.; He expects **us not to be late**. – Он предполагает (ожидает), что мы не опоздаем.; I like **her to sing**. – Мне нравится, как она поет.

Task 17. Transform the sentences according to the pattern suggested.

Model: You must wait for me / want. – I *want you to wait for me*.
You shouldn't do it / want. – I *don't want you to do it.*

1) He should be more careful in future / expect. 2) You ought to follow the doctor's advice / would like. 3) Your daughter should practice more / would like 4) They must obey the rules / expect. 5) Why don't you try on this fur coat? / would like. 6) You shouldn't overwork / want. 7) You mustn't ruin your life / want. 8) The students should rehearse the play again / would like. 9) Sally must rewrite the introductory part / want. 10) You should give them a helping hand / expect.

Task 18. Transform the sentences according to the pattern suggested.

Model: This village shouldn't be lost. We don't want it.
We *don't want this village to be lost.*

1) These photographs must be printed today. I expect it. 2) Michael mustn't be considered a coward. I don't want it. 3) The hotel must be booked well in advance. I expect it. 4) The criminal must be sent to prison. I expect it. 5) Mike should be promoted. I want it. 6) This mistake mustn't be repeated in future. I don't want it. 7) The furniture must be delivered on Wednesday. I expect it. 8) She mustn't be so heavily made up. I don't want it. 9) They should be treated with respect. I want it. 10) This accident mustn't be forgotten. I don't want it.

C) The Complex Subject

При переводе предложений с конструкцией the Complex Subject

сказуемое выносится перед подлежащим и переводится неопределенно-личной формой глагола типа ***говорят, известно, сообщается, обнаружено*** и т. д., а сама конструкция переводится придаточным предложением с союзом ***что*** или ***чтобы***. Именная часть сложного подлежащего переводится подлежащим придаточного предложения, а инфинитив – сказуемым.

В конструкции the Complex Subject глаголы употребляются в страдательном и в действительном залоге:

Группы глаголов	**Примеры употребления**
Глаголы физического восприятии: ***see. hear, feel, notice, watch, observe***, etc.	This mail ***was seen to break*** the window. ***Видели, как*** этот человек разбил окно.
Глаголы умственной деятельности: ***know, think, believe, consider, regard, expect, suppose, mean, presume, intend***, etc.	The British ***are considered to be*** rather conservative. ***Считается, что*** британцы довольно консервативны.
Глаголы сообщения, утверждения: ***say, tell, report, announce***, etc.	She ***is said to be*** very beautiful. ***Говорят, что*** она очень красива.
Глаголы обнаружения: ***find, show, demonstrate,*** etc.	This phenomenon ***has been found to have*** a frequent occurrence. ***Обнаружено, что*** это явление часто встречается.
Глаголы причинности: ***cause, make, let, permit, allow, request, prove***, etc.	Goat's milk ***was proved to be*** good for eyes. ***Доказано, что*** козье молоко полезно для зрения.
Следующие глаголы употребляются в этой конструкции **в действительном залоге**: ***seem, appear, turn out, happen***, etc.	The water ***seems to be*** *boiling*. ***Кажется,*** вода кипит.
Complex Subject употребляется со словосочетаниями ***be likely/unlikely,*** ***be sure/certain,*** ***be possible/impossible***, etc.	They ***are likely to come*** soon. ***Вероятно,*** они скоро придут. He ***is sure to be asked*** about it. Его, ***наверняка***, об этом спросят.

Task 19. Paraphrase the sentences using the Complex Subject.

Model: *It is said that John* is living in London.
John is said to be living in London.

1) It is known that this resort is very popular with tourists. 2) It is known that this drug relieves pain. 3) It is expected that the new government will

combat inflation. 4) It is feared that this epidemic is spreading. 5) It is supposed that you will obey the rules. 6) It is generally considered that this child is a genius. 7) It was declared that the two countries were at war. 8) It is considered that this method is safe. 9) It is supposed that this movie star is staying at the Hilton. 10) It is expected that the airline will negotiate the new contract with the union.

Task 20. Paraphrase the sentences using the Complex Subject with the Perfect Infinitive.

Model: *It is said that he* has died. — ***He is said to have died***

l) It is said that Andrew has been married five times. 2) It is known that Mr. Luton has lived a hard life. 3) It is believed that this civilization perished more than 10,000 years ago. 4) It is feared that all the missing climbers died of hypothermia. 5) It is said that this exhibition was a great success. 6) It was rumored that the millionaire had squandered all his money. 7) It was thought that the Minister had had a heart attack. 8) It is rumored that they have elected a new president of the company. 9) It is known that the architect has given up the project. 10) It is known that the initiative group has collected more than 10,000 signatures.

Learn some fish idioms!

***smell fishy –** выглядеть подозрительно, не вызывать доверия

Translate these sentences.

His explanation definitely smells fishy; my guess is that he's lying.
Something about the deal smelled fishy.

***fish for –** напрашиваться на (приглашение, комплимент); выуживать (секреты, информацию)

Translate these sentences.

Jerry was always fishing for an invitation to Bob's house.
Personally, if I have time, I like to fish for as much information as possible.

UNIT 10

WHAT'S WRONG WITH FISH FARMS?

I. Words to know before you read

avoid – избегать, избежать
carnivorous [kaː´niv(ə)rəs] – плотоядный, хищный
catch on – быстро улавливать смысл, прекрасно осознавать
cause [kɔːz] – быть причиной, вызывать
confinement [kən´fainmənt] – содержание в закрытом помещении / в ограниченном пространстве
contamination – загрязнение
environmentally acceptable – экологически приемлемый, допустимый с экологической точки зрения
escape [i´skeip] – убегать, уходить
exploitation [´ekspləi´teiʃ(ə)n] – использование в своих интересах, эксплуатация
factory farm – агропромышленная ферма
fail – потерпеть провал, не удаться
farmed fish – искусственно выращенная рыба
feeder fish – живой корм
fishery [´fiʃəri] – рыболовный промысел, рыболовство, рыбоводство
fishmeal – рыбная мука
floating [´fləʊtiŋ] – плавающий
food pellets – гранулированный корм
force – заставлять
from a … standpoint – с …. точки зрения
GMOs = genetically modified organisms – генетически модифицированные организмы
go vegan [´viːgən] – стать вегетарианцем
grain – зерно
immediate [i´midiət] – мгновенный, незамедлительный
inefficiency [´ini´fiʃ(ə)nsi] – неэффективность, бесполезность
inherent [in´hi(ə)rənt] – изначальный, неизбежный, характерный
interbreed – скрещиваться
it takes – требуется, нужно
magnify [´mægnifai] – увеличивать
make a mess – мусорить, производить беспорядок
regarding [ri´gaːdiŋ] – относительно, касательно, что касается

regardless of – независимо от, вне зависимости от
runoff – сток, отходы
sentient [ˊsenʃ(ə)nt] – наделенный чувствами, ощущающий, сознающий
solution. [səˊluːʃ(ə)n] – решение
state – (*v*) заявить, заявлять, утверждать
strain – напряжение
take into account – принимать во внимание
terrific – ужасающий, потрясающий, колоссальный
tremendous [triˊmendəs] – огромный, гигантский
vast [vaːst] – огромный, громадный
wild fishery – вылов диких рыбных ресурсов
wild-caught fish – промысловая рыба; рыба, выловленная в природной среде

Task 1. Translate the following collocations.

1) Inherent inefficiency of animal agriculture, 2) wild-caught feeder fish, 3) ocean-caught fish, 4) tremendous amount of highly concentrated protein pellets, 5) vast amounts of wild-caught fish, 6) take strain off wild fisheries, 7) vegetarian farmed fish, 8) carnivorous farmed fish, 9) plant foods, 10) plant protein, 11) a variety of environmental problems, 12) confinement system, 13) immediate contamination, 14) drinking water, 15) marine life, 16) marine ecosystem, 17) from an environmental standpoint.

Task 2. **Match the words with their meaning, then translate the sentences below paying attention to the words in italics**.

1) while	a) вместо
2) just as	b) все еще
3) regarding	c) главным образом, в основном
4) mostly	d) из-за, вследствие, по причине
5) however	e) или… или
6) still	f) независимо от
7) only when	g) однако
8) instead of	h) относительно; что касается
9) regardless of	i) пока; в то время, как
10) either… or…	j) потому что, так как
11) in order to	k) такой же… как
12) the same … as	l) только когда
13) because	m) точно так же, как
14) because of	n) чтобы

1) They met *while* they were in college. *While some believe that* fish farming is the solution to overfishing, they *do not take into account* the inherent inefficiency of animal agriculture. 2) In a relationship, *just as it takes* two to tango, *it takes* two to heal. 3) We have interesting information *regarding fish farms*. 4) Green teas are *mostly* from China or Japan. 5) *However,* eating vegetarian farmed fish looks environmentally acceptable *only when compared* to eating carnivorous farmed fish. 6) Do you *still* have Julie's phone number? 7) Could I have tuna *instead of* ham? 8) Everyone has a right to a job, *regardless of* their race, sex, or colour. 9) These vegetables can be eaten *either* raw *or* lightly cooked. 10) Plants need light *in order to* survive. 11) Your idea is *the same as* his. Breadfruit has *the same* texture *as* bread. 12) *Because* fish are sentient, they have a right to be free from human use and exploitation. 13) The job is attractive *because of* the pay.

II. Reading

Task 3. Read the text quickly and answer the questions.

1. What makes fish farms similar to factory farms?
2. Why are fish farms called ‘floating pig farms’?
3. What environmental problems do aquatic factory farms cause?

Fish farms are aquatic factory farms

While some believe that fish farming is the solution to overfishing, they do not take into account the inherent inefficiency of animal agriculture. Just as it takes 12 pounds of grain to produce a pound of beef, it takes 70 wild-caught feeder fish to produce one salmon on a fish farm. Time magazine[1] reports that it takes 4.5 kg of ocean-caught fish to produce 1 kg of fishmeal that is fed to a fish on a fish farm.

Floating Pig Farms

Regarding fish farms, Daniel Pauly, professor of fisheries at the University of British Columbia[2] in Vancouver[3] states, "They're like floating pig farms . . . They consume a tremendous amount of highly concentrated protein pellets and they make a terrific mess." Rosamond L. Naylor, an agricultural economist at Stanford's Center for Environmental Science and Policy[4] explains about aquaculture, “We are not taking strain off wild fisheries. We are adding to it.”

Vegetarian Fish

Some people are catching on, and recommending that consumers choose farmed fish who are mostly vegetarian, to avoid the inefficiency of feeding wild-caught fish to farmed fish. Scientists are even trying to develop (mostly) vegetarian food pellets to feed to carnivorous fish on fish farms. However, eating vegetarian farmed fish looks environmentally acceptable only when compared to eating carnivorous farmed fish. There is still the inherent inefficiency of feeding soy, corn or other plant foods to animals, instead of using that plant protein to feed people directly.

Waste, Disease, and GMOs

Regardless of whether the farmed fish are eating fish or grain, there is still a variety of environmental problems because the fish are raised in confinement systems that allow waste and water to flow in and out with the oceans and rivers in which they are located. While fish farms cause many of the same problems as factory farms on land – waste, pesticides, antibiotics, parasites and disease – the issues are magnified because of the immediate contamination of the surrounding ocean water.

There is also the problem of farmed fish escaping into the wild when nets fail. Some of these farmed fish are genetically modified, which forces us to ask what happens when they escape and either compete with or interbreed with wild populations.

Eating land animals also causes problems for marine life. Vast amounts of wild-caught fish are being fed to livestock on land, mostly pigs and chickens, in order to produce meat and eggs for human consumption. Runoff and waste from factory farms kill fish and other marine life and contaminate our drinking water.

Because fish are sentient, they have a right to be free from human use and exploitation. From an environmental standpoint, the best way to protect fish, marine ecosystems and all ecosystems is to go vegan.

Notes

[1]**Time magazine** – американский еженедельный журнал со штаб-квартирой в Нью-Йорке

[2]**University of British Columbia** – Университет провинции Британская Колумбия (Канада)

[3]**Vancouver** [væn´ku:və] – г. Ванкувер (пров. Британская Колумбия, Канада)

[4]**Stanford** – город и разговорное название Стэнфордского университета; Stanford's Center for Environmental Science and Policy – НИЦ изучения окружающей среды Стэнфордского университета (США)

III. Comprehension check

Task 4. Decide if the statements are true (T) or false (F)?

1. According to some scientists, fish farms place huge strain on wild fisheries.
2. Plant protein is used to create food pellets for carnivorous fish on fish farms.
3. Confinement systems for raising fish don't let waste and runoff flow into the oceans and rivers.
4. Fish farms contaminate the surrounding ocean water.
5. Farmed fish never escape into the wild.

Task 5. Read the text again and answer the questions

1. How many wild-caught feeder fish does it take to produce one salmon?
2. What feed is used on a fish farm to raise fish?
3. *How many kilograms of ocean-caught fish does it take to produce 1 kg* of this feed?
4. What do fish farms have in common with pig farms?
5. Why do scientists develop vegetarian food pellets to feed carnivorous fish on fish farms?
6. What kind of environmental problems are characteristic of fish farms?
7. Why are environmental problems caused by fish farms even more disturbing than those caused by factory farms on land?
8. Why can fish raised in confinement systems escape into the wild?
9. Why are fish escaping from fish farms dangerous for wild populations?
10. Why do land-based animal farms cause problems for marine life?

IV. Vocabulary building

Task 6. Match the words with their definitions.

1) feed	a) answer to a problem
2) feeder fish	b) certain type of inexpensive fish commonly fed as live prey to captive animals such as sharks or turtles
3) fishmeal	c) food given to animals
4) pellets	d) ground dried fish used mainly for livestock feed
5) solution	e) small, compressed, hard chunks of matter

Task 7. Fill in the gaps with one of the words from Task 7.

1. There's no _____ to this problem. 2. Hundreds of women-headed households received chickens and poultry _____. 3. Several fast-growing and hardy species are commonly sold and used as _____. 4. _____ is a commercial product mostly made from fish that are not generally used for human consumption; a small portion is made from the bones and offal left over from processing fish used for human consumption, while the larger percentage is manufactured from wild-caught, small marine fish. 5. Raised in freshwater tanks and weaned on to fishmeal _____, fry are transferred to earth ponds or gravel raceways fed by rivers.

Task 8. Match the synonyms.

1) raise	a) awful
2) tremendous	b) captivity
3) terrific	c) farm animals
4) mess	d) fish farm
5) pellets	e) granules
6) fishery	f) litter
7) waste	g) pollution
8) contamination	h) rear
9) confinement	i) refuse
10) livestock	j) vast

Task 9. Find in the text the English equivalents of the following words and word combinations.

1) Чрезмерный вылов рыбы; 2) животноводство; 3) рыбное хозяйство; 4) рыбоводство / рыболовство; 5) свиноферма; 6) лосось; 7) потреблять; 8) белковые гранулы; 9) кормовые гранулы, гранулированный корм; 10) хищная рыба; 11) скот, живность; 12) потребление человеком, употребление в пищу людям; 13) стоки и отходы от агропромышленных ферм; 14) питьевая вода.

Task 10. Put each word into the correct blank.

1) ***resources*** **/** ***contributes***

Aquaculture should be a mechanism that _____to the preservation of global fishery _____.

2) ***natural*** **/** ***human*** **/** ***safe***

Fish caught in_____ habitats may not be _____ for _____ consumption.

3) ***flourish / escape / contaminate***

If farmed fish species _____ from their enclosures, there is a heightened risk that sea lice and other parasites that _____ in fish farm environments will _____ wild fish populations.

4) ***populations / pathogens***

The antibiotics used on fish farms to control_____ and parasites also can be introduced by escaped fish into natural fish _____ .

5) ***species / concerns***

Genetic modification (GM) of aquatic _____ is a further aquaculture issue that raises environmental _____ .

6) ***destroy / escape***

Critics assert that breeding between GM species that _____ from salmon farms into natural habitats could _____ wild salmon populations.

7) ***habitats / nutrients***

Intensive aquaculture practices tend to remove large amounts of _____ from aquatic _____ from relatively small areas in short periods.

8) ***nutrients / practices / periods / habitats***

Intensive aquaculture _____ tend to remove large amounts of _____ from aquatic _____ from relatively small areas in short _____.

9) ***balance / waste / volume***

The large _____ of fish _____ generated by fish farms also tends to upset the optimal ecological _____ in the locale.

10) ***species / production / fishmeal***

The vast majority of aquaculture _____ on the global scale involves omnivorous _____ such as carp, catfish, and tilapia), which can be raised on feeds using very little or no _____.

Task 11. Find the odd word in each line. Use the dictionary if necessary.

1) wild	omnivorous	vegetarian	carnivorous
2) waste	runoff	effluent	issues
3) fishmeal	feed	rivers	nutrients
4) enclosure	confinement	cage	plant
5) escape	raise	rear	grow
6) tank	problem	basin	reservoir
7) salmon	tilapia	livestock	carp
8) population	production	consumption	destroy
9) pathogens	parasites	viruses	amounts

WORD FORMATION

Task 12. Find in the texts of this unit the necessary derivatives to complete the table.

Verb	Noun (who?)	Noun (what?)	Adjective
solve	–	?	solvable
–	–	?	effective
?	producer	production	productive
?	–	addition	added
?		explanation	explainable
?	–	recommendation	recommended
?	consumer	?	consumable
?	?	?	contaminated
?	competitor	competition	competitive
populate	–	?	populated
exploit	exploiter	?	exploitable

Task 13. Choose the correct word.

1. The term blue revolution refers to the remarkable emergence of aquaculture as an important and highly (*produce, producer, production, productive*) agricultural activity

2. Many species of freshwater and marine organisms are being cultivated as highly productive and nutritious crops for (*consume, consumer, consumption, consumable*) by humans.

3. Strange creatures (*populate, population, populated*) the ocean depths.

4. Even licensed fishing has a major effect on the fish *(populate, population, populated*) in the river.

5. Small businesses have to (*compete, competitor, competition, competitive*) on equal terms with large organisations.

6. She left the room without (*explain, explanation, explainable*).

7. We must (*exploit, exploiter, exploitation*) the resources we are given wisely.

8. There is no obvious (*solve, solution, solvable*) to the problem.

9. The price does not include tax (*add, addition, added*) on.

10. Concerns about water quality are most commonly related to its microbial (*contaminate, contaminator, contamination, contaminated*).

11. Aspirin is (*efficiency, inefficiency, effective, ineffective*) in controlling headaches.

V. Grammar revision – Gerund vs. Infinitive

Герундий (gerund) – это неличная форма глагола, обладающая свойствами глагола и существительного. В русском языке нет аналогичной грамматической формы, поэтому на русский язык герундий может переводиться существительным, инфинитивом или придаточным предложением.

Tense	Active Voice	Passive Voice
Indefinite	**V + ing / doing** I enjoy **telling** jokes. Мне нравится **рассказывать** шутки.	**Being + V_3 / being done** I enjoy **being told** jokes. Мне нравится, когда **мне рассказывают** шутки.
Perfect	**Having + V_3 / having done** I'm proud of **having won** this prize. Я горжусь тем, что **выиграл** этот приз.	**having been + V_3 / having been done** I am proud of **having been awarded** this prize. Я горжусь тем, что **меня наградили** этим призом.

А) Запомните глаголы и фразы, после которых употребляется либо только герундий, либо только инфинитив.

Verb + gerund	Verb + infinitive
admit – допускать, признавать	afford – позволить себе
appreciate – ценить, понимать	agree – соглашаться
avoid – избегать	appear – казаться, оказаться
be worth – стоит (делать что-то)	arrange – устроить, организовать
burst out – разразиться (плачем, смехом)	ask – спросить, спрашивать
can't help – не мочь не делать чего-то	attempt – пытаться
can't stand – не выносить (кого / чего)	be glad/pleased/ able/surprised etc –
consider – считать, рассматривать	рад / доволен / способен / удивлен
delay – задерживать, откладывать	choose – выбирать
deny – отрицать	decide – решить
discuss – обсуждать	expect – ожидать, рассчитывать
dislike – не нравиться	fail – не смочь сделать
enjoy – наслаждаться, получать удовольствие от чего, любить что-то	happen – случаться
	help – помогать
fancy – нравиться, любить	hope – надеяться
feel like – испытывать желание, быть склонным делать что-то	intend – намереваться
	learn – выучить, узнать
finish – кончать, заканчивать	manage – суметь, ухитриться
forgive – прощать	offer – предлагать
give up – отказываться, бросать делать	prepare – приготовить
imagine – вообразить, представить себе	plan – планировать
involve – вовлекать, предполагать	pretend – притворяться

keep – продолжать делать mention – упоминать, ссылаться mind – возражать, быть против miss – скучать, пропустить postpone (put off) – откладывать practise – тренироваться resist – сопротивляться, противиться risk – рисковать spend time – проводить время suggest – предлагать be/get used to – быть / стать привычным к look forward to – с нетерпением ждать object to – возражать, протестовать how/what about – как насчет… it's no good/use – не годится / нет смысла делать что-то there is no point in – нет смысла what's the point/use of..? – в чем смысл..? be worth doing – стоит делать что-то	promise – обещать refuse – отказываться seem – казаться want – хотеть wish – желать would like/prefer – хотел бы / предпочел бы used to do smth – раньше (бывало, когда-то) делал что-то; имел обыкновение делать что-то

Task 14. Study the following examples. Translate the sentences.

1) Do you mind opening the door? 2) She kept laughing. 3) Avoid walking alone in the dark. 4) He denies robbing the bank. 5) Just imagine spending a holiday there. 6) I couldn't help laughing. 7) I don't feel like talking. 8) The exhibition is worth visiting. 9) It was no use speaking with him. 10) What's the use of arguing? 11) He is used to getting up late. 12) I hate his manner of speaking. 13) How much time do you spend doing your homework every day? 14) I don't mind going on business trips. 15) He is busy reading.

Task 15. Complete the sentences with the correct form of the verbs in brackets.

1. We've decided _____ (buy) a 3D printer. 2. Instead of _____ (do) our own housework, in the future robots will do it for us. 3. I use my mobile _____ (text) or _____ (surf) the Internet, but never for calls any more. 4. I miss _____ (receive) letters by post. _____ (get) an email is not nearly as exciting. 5. I haven't got a dishwasher. Do you mind _____ (wash) the dishes by hand? 6. It's easy _____ (spend) lots of time looking at screens, but it could end up _____ (hurt) your eyes. 7. I don't know how you can expect _____ (do) so much work in so little time! 8. Do you ever get tired of _____ (sit) at a desk all day? 9. I've got lots of exciting things _____ (tell) you! 10. My favourite pastime is _____ (play) video games on my computer. 11. I'm going to the library _____ (do) my Chemistry homework. 12. It's dangerous _____ (give) out personal data and information on the Internet.

Task 16. Put the verbs in brackets into the Infinitive or -ing form.

My neighbour, Mr Mason, loves 1) *spending* (spend) time in his garden. He would rather 2)_____ (work) outside than stay indoors, even when it is snowing! Early in the morning, you can 3) _____ (see) Mr Mason 4) _____ (eat) breakfast in his garden, and late at night he is there again, with a cup of cocoa in his hand. I'd like 5) _____ (help) sometimes when there is lots of work to do, but Mr Mason prefers 6) _____ (do) everything himself. He doesn't mind 7) _____ (get) cold and wet in the winter, and his wife says it's no use 8) _____ (try) to make him wear a waterproof jacket because he hates 9) _____ (wear) them! Mr Mason says he will go on 10) _____ (garden) until he is too old 11)_____ (do) it!

Task 17. Put the verbs in brackets into the infinitive or -ing form.

My mother is an amazing woman. She is 87 years old and she still enjoys 1) *going out* (go out) for a walk every day. She doesn't mind 2) _____ (do) all her housework and she's glad 3) _____ (help) her elderly neighbours when they can't 4)_____ (go) to the shops. She's too old 5) _____ (dig) the garden any more – she stopped 6)_____ (do) that last year – but she's still healthy enough 7)_____ (mow) the grass! In the summer she still goes 8)_____ (swim) when it's warm and she lets her grandchildren 9) ____ (bury) her in the sand. She often says, "It's no good 10) _____ (be) alive if you don't enjoy yourself." I'd love 11) _____ (be) like my mother when I'm her age.

B) Запомните глаголы, после которых может употребляться как герундий, так и инфинитив, но со смысловым различием.

verb	+ doing	+ to do
remember **forget**	действие совершено: I remember meeting you last year. Я помню, что встречался с тобой в прошлом году. I'll never forget visiting this city. Я никогда не забуду, как я посещал этот город.	действие еще не совершено: I must remember to post this letter. Я должен не забыть отправить это письмо. I forgot to post this letter. Я забыл отправить это письмо.
regret	сожалеть о том, что уже случилось: I regret telling him this news. Я сожалею о том, что рассказал ему эту новость.	сожалеть о том, что хотите сказать: I regret to inform you that your plane will be delayed. Я с сожалением сообщаю вам, что ваш самолет задерживается.

stop	прекратить действие: Stop talking! Прекратите разговаривать.	остановиться, чтобы сделать что-то: We stopped to buy some sweets. Мы остановились, чтобы купить конфет.
try	попробовать сделать что-то для достижения цели: If you want to lose weight, try jogging. Если вы хотите похудеть, попробуйте бегать по утрам.	попытаться сделать что-то, прилагая усилие: I tried to move the table, but it was too heavy. Я попробовал сдвинуть стол, но он оказался очень тяжелым.
go on	продолжить действие: Go on reading! Продолжайте читать!	перейти к новому роду деятельности: I started by collecting pencils, but then I went on to collect stamps. Я начал коллекционировать карандаши, но затем перешел к собиранию марок.
need **want**	пассивное действие: The windows need (want) cleaning. Окна нуждаются в чистке. (Окна нужно помыть.)	активное действие: You need (want) to clean the windows. Тебе нужно помыть окна.
hate	отвращение: I hate going to the opera. Я терпеть не могу ходить в оперу	сожаление: I hate to trouble you. Мне жаль, что я вас побеспокоил.
mean	означать, значить Ordering online means registering with them. Делать заказ онлайн значит зарегистрироваться у них.	намереваться, иметь в виду I only meant to help you. Я лишь хотела помочь вам.

Task 18. Choose the correct alternative.

1. On the way from Brighton to London, we stopped *having/to have* a coffee and a rest.

2. My dad stopped *smoking/to smoke* almost 20 years ago.

3. I really regret *selling/to sell* my old car.

4. I regret *saying/to say* that we cannot offer you the job in our firm.

5. We'd better go back. I'm not sure if I remembered *locking/to lock* the front door.

6. It's your fault you missed the party. I can distinctly remember *telling/to tell* you it was on Friday at 8.

7. Ada left university and went on *to become/ becoming* a brilliant computer programmer.

8. She regrets *not to go/not going* to university.

9. I forgot *to book/booking* our tickets yesterday, so I'll do that now.

10. He went on *to look/looking* at his phone in the cinema even after the film had begun!

Task 19. Gerund or Infinitive? Fill in the correct form of the verb in brackets.

Mr Miller is talking to his best friend on the phone. Here is what he says: Are you sure I lent you some money last week? I don't remember (1) _____ (lend) you any.

And another thing. Did you remember (2) _____ (phone) your sister? You told me to remind you. When you see Mandy, remember (3) _____. (give) her my regards (передать привет), won't you? No, I haven't found my handbag, yet. I tell you, someone must have taken it . I clearly remember (4) _____. (leave) it by the window and now it has gone.

I hate (5) ._____ (look for) things, it makes me nervous. I hate (6) _____ (trouble) Mrs Steel with this problem, but I'll have to ask her to look in my office again.

Learn some fish idioms!

*__fish fry –__ пикник на берегу реки с жареньем рыбы

*__teach fish how to swim__ – смешно учить рыбу плавать; не учи учёного

Translate these sentences.

The guests at the fish fry caught and cooked their own fish.

Never offer to teach fish to swim.
I know that explaining (topic) to you, guys, is like teaching fish how to swim…

*__feed the fishes__ – 1) пойти на корм рыбам, утонуть; 2) страдать морской болезнью, страдать рвотой (вследствие морской болезни)

Translate these sentences.

The sea never affects me, but my unfortunate brother spent most of his time feeding the fishes.

If you can't swim it's only a matter of time till you feed the fishes!

READING BANK

Read the text and answer the questions:

Why is aquaculture called Blue Revolution?
What is the principal goal of aquaculture?

TEXT 1.

Blue Revolution (Aquaculture)

The term blue revolution refers to the remarkable emergence of aquaculture as an important and highly productive agricultural activity. Aquaculture refers to all forms of active culturing of aquatic animals and plants, occurring in marine, brackish, or fresh waters.

Aquaculture has long been practiced in China and other places in eastern Asia, where freshwater fish have been grown as food in managed ponds for thousands of years. In recent decades, however, the practice of aquaculture has spread around the world. Many species of freshwater and marine organisms are being cultivated as highly productive and nutritious crops for consumption by humans. The tremendous growth of aquaculture has been stimulated by knowledge that there are intrinsic limitations to the productivity of the wild, unmanaged aquatic ecosystems that humans have traditionally exploited as sources of fish, aquatic invertebrates, and seaweeds. Moreover, in a depressingly large number of cases, the usable productivity of natural aquatic ecosystems has been overexploited or otherwise degraded by humans, and the harvested yields have declined substantially.

In many cases, however, the productivity of valuable aquatic species can be greatly increased under managed conditions, and also by genetic selection for varieties having desirable traits, such as higher productivity. The principal goal of aquaculture science is to develop systems by which aquatic organisms can be grown and harvested at high but sustainable rates, while not causing unacceptable environmental damage.

Aquaculture production

Aquaculture accounted for over 40 million tons of global fish supplies in 2005. When aquatic plants are included, the figure goes up to 51.4 million tons. The countries of Asia contribute over 90 % of these figures. China, by itself, contributes more than 70 %. These amounts have far exceeded earlier years. For example, aquacultural activity in Asia was 16 million tons of production in 1995, compared with 1.5 million tons in Europe, 0.46 million tons in North America, and 0.60 million tons in the rest of the world. As of

2006, the top ten species of fish caught with aquaculture are (in order of total amount): carps and other cyprinids; oysters; miscellaneous marine mollusks; clams, cockles, and arkshells; salmons, trouts, and smelts; tilapias and other cichlids; mussels; miscellaneous marine crustaceans; shrimps and prawns; and scallops and pectens.

In comparison, the global supply of fish in 2004 was about 135 million tons. Thus, aquaculture contributes about 30 % to fish production worldwide. Clearly, aquaculture is an extremely large and rapidly growing enterprise.

(Source: The Gale Encyclopedia of Science. <http://www.encyclopedia.com >.

TEXT 2.

Read and translate the article.

The Future of Aquaculture

Aquaculture seems to be developing is two different ways.

One way is toward further development and spread of the large, highly technical farms capable of producing a million pounds of aquatic organisms each year. These farms specialize in cultivation and are able to process and market their own product. Although there is some debate about the quality of fish raised in such large systems, it is clear that these farms can produce ever larger volumes of fish. Globally, five companies own the great majority of these large farms.

The second trend is toward further spread and development of networks of smaller farms requiring less technology and therefore less capital investment than the factory fish farms. These smaller farms tend to market their product locally or in cooperation with other small farmers. These farms raise a greater diversity of crops and they integrate fish farming with the other crops. The wastewater, for example, may be used to raise vegetables and other cash crops. The small farms have to rely on pumped water and may have to build marshes where the water can be purified naturally before being pumped back into the tanks or ponds.

Much more work must be done in order to harmonize the intensive production of fish and the environment. Large-scale aquaculture is still a new and undeveloped industry when compared to terrestrial agriculture. Only a few species (some salmonoids, Pacific white shrimp, and possibly several species each of catfish, carp, and tilapia) are currently on their way to becoming true domesticated aquabuisiness species in the way that poultry, beef, and pork have long been. While the aquaculture industry is still only a

small way into the development curve, the inherent biological characteristics of aquatic animals bode well for the future contribution of aquatic farming to living standards and the environment.

Aquaculture has developed by trial and error for millennia, without causing the severe environmental impact so evident in the history of hunting and intensive agriculture. However, the art, science, and business of aquaculture is now at a crossroads. On the one hand, it offers great potential toward satisfying humanity's need for protein and helping economies of developing nations. However, its rapid growth and modernization also means that it may move toward intensive aquaculture, as we have seen in agriculture, with the potential for serious threats to aquatic systems. The quest for high profits could be accompanied by abuses, environmental and otherwise, which is why opposition is seen by some NGOs. It is important that well-balanced systems be developed that are sustainable. If done correctly, it offers a great potential to help humanity.

The importance of aquaculture was recognized in 2005 with the awarding of the $250,000 World Food Prize, considered the Nobel Prize of food and agriculture, to an Indian scientist, Modadugu Gupta, for his work in aquaculture. Gupta created an inexpensive and ecologically sustainable system of fish farming that can be done on a small scale, using ditches and seasonally flooded water holes or small ponds. These small ponds produced protein and income for more than one million families in Southeast Asia and Africa, increasing freshwater fish production in some countries by three to five times. Many of those utilizing these systems are poor women and landless farmers, raising as few as two hundred fish, sometimes in narrow ponds along roadways filled with water in the rainy season.

TEXT 3.

Read the text and answer the questions:

Why did Dr Borlaug decide to found The World Food Prize?

Experts in what areas have been awarded The World Food Prize over the past 30 years?

What is the purpose of the World Food Prize youth programs?

Dr. Borlaug & The World Food Prize

In 1970, he realized there should be a prestigious, international award given each year to honor the work of great agricultural scientists working to end hunger and improve the food supply.

In 1986, he founded The World Food Prize, an annual $250,000 award that he hoped would both highlight and inspire breakthrough achievements in improving the quality, quantity and availability of food in the world, and which is now often referred to as the "Nobel Prize for Food and Agriculture."

Dr. Borlaug imbued this foundation with his philosophy that confronting hunger and poverty can bring people together across even the widest political, religious, ethic, or diplomatic divides.

Over the past 30 years, The World Food Prize has been awarded to laureates from Bangladesh, Belgium, Brazil, Cape Verde, China, Cuba, Denmark, Ethiopia, Ghana, India, Israel, Mexico, Sierra Leone, Switzerland, Uganda, United Kingdom, the United Nations and the United States. They have been recognized for a wide array of work, in areas including soil and land; plant and animal science; food science and technology; nutrition; rural development; marketing; food processing and packaging; water and the environment; natural resource conservation; physical infrastructure; transportation and distribution; special or extraordinary feeding programs; social organization and poverty elimination; economics and finance; policy analysis; and public advocacy.

Dr. Borlaug also helped build the World Food Prize "Borlaug Dialogue" international symposium, which brings together the world's top minds each year to address cutting-edge issues in hunger and food security. He also developed the World Food Prize youth programs, which engage high school and college students in the fight to end hunger and introduces them to potential academic and career paths in agriculture and related fields.

Dr. Borlaug's statue in the U.S. Capitol is a great inspiration to scientists, leaders, and the next generation of hunger fighters around the world as we confront what World Food Prize President Amb. Kenneth M. Quinn calls "the single greatest challenge in human history: whether we can sustainably feed the 9 billion people who will be on our planet in the year 2050."

TEXT 4.

World Food Prize Goes To Nigerian Banker
29th June, 2017

The president of the African Development Bank, Akinwumi Adesina, has won the 2017 World Food Prize. Mr Adesina won the prize and $250,000. He got the award for his two decades of work in increasing food

production in Africa. He used his experience as a top banker to help agriculture in Africa. He helped to change many farming laws and made it easier for small farmers to get loans for their business. He also helped farmers to modernize their farms and the way they grow their crops. The World Food Prize Foundation President, Kenneth Quinn, said Mr. Adesina won the prize, "for driving change in African agriculture for over 25 years and improving food security for millions across the continent".

The World Food Prize was created by the 1970 Nobel Peace Prize winner Norman Borlaug. He is known as the father of the "green revolution". He helped to breed crops that produced more food and were stronger and more resistant against disease. His work helped to prevent famine in Asia in the 1960s. Mr Quinn said Adesina "grew up in poverty" in Africa and decided to do his best at school to get a good education. He got a Ph.D. in agricultural economics. He became a leader in African banking and was also Nigeria's Minister of Agriculture from 2011 to 2015. Quinn said Asedina used his background and experiences to, "lift millions of people out of poverty, especially farmers in rural Africa".

1. Decide if a-h below are true (T) or false (F).

a) The World Food Prize winner got $250,000.
b) The winner spent two decades helping to create more food in Africa.
c) The winner told farmers to stick to old ways of farming.
d) The winner improved food security for millions of Africans.
e) A Nobel Peace Prize winner created the World Food Prize.
f) Akinwumi Adesina created crops that were stronger against disease
g) Akinwumi Adesina helped to prevent famine in Africa in the 1960s.
h) Akinwumi Adesina was Nigeria's Minister of Agriculture in 2016

2. Comprehension questions

1. What development bank is Akinwumi Adesina the president of?
2. How much money did Akinwumi Adesina win?
3. For how many decades did Mr Adesina increase food production?
4. What did Akinwumi Adesina make it easier for farmers to get?
5. What did Akinwumi Adesina improve across the African continent?
6. What was the 1970 Nobel Peace Prize winner known as the father of?
7. When did stronger crops help to prevent famine in Asia?
8. What did Akinwumi Adesina get a degree in?
9. When was Akinwumi Adesina Nigeria's Minister of Agriculture?
10. How many people did Akinwumi Adesina's work lift out of poverty?

3. Synonym match: Match the following synonyms. The words in bold are from the news article.

1. award	a. bring up to date
2. increasing	b. stop
3. top	c. farming
4. modernize	d. expanding
5. agriculture	e. countryside
6. created	f. prize
7. breed	g. raise
8. prevent	h. reproduce
9. lift	i. leading
10. rural	j. developed

4. Phrase match: (**Sometimes more than one choice is possible**.)

1. Mr Adesina won the prize	a. against disease
2. made it easier for small farmers	b. the continent
3. the way they grow	c. of poverty
4. improving food	d. to get loans
5. millions across	e. famine in Asia
6. He is known as the father of	f. and $250,000
7. stronger and more resistant	g. security
8. His work helped to prevent	h. in agricultural economics
9. He got a Ph.D.	i. their crops
10. lift millions of people out	j. the "green revolution"

TEXT 5.

Polyculture

In some semi-intensive and extensive culture systems, such as ponds, the target species will share the environment with other related species, e.g. a target fish with other fish or a target shrimp with crabs. Depending on the degree of niche overlap, these other species may compete with the target species for food, habitat, etc. On the other hand, they may facilitate its growth and health through supporting activities, e.g. a detritivore removing benthic waste from the environment before it creates anoxic conditions in the lower water column.

Polyculture describes the deliberate culture together of complementary species, i.e. species occupying complementary niches, especially in regard to their food and feeding (Fig. 1). Polyculture increases production per unit area or volume of the pond by maximising the utilization of all nutritional

niches within the pond. A greater proportion of the primary production is utilised as the target species are linked to more of the food webs than a single species, resulting in increased productivity. They also have the effect of reducing the complexity of the food webs because they 'cover' a high proportion of primary production at its sources with their feeding. In these ways, polyculture systems may average fish production of ca. 3 t/ha/year in ponds in which there is heavy addition of manure fertiliser. With supplemental feeding there may be yields up to 16 000 kg/ha/year.

A new form of polyculture that is being researched is the use of effluent from, for example, marine shrimp ponds for the culture of complementary species. The effluent, rich in nutrients and sediment and potentially an environmental hazard, may be passed through further ponds containing animals or plants that extract the nutrients and sediment from the effluent. There may be bivalves, which filter the water of sediment, microalgae and some bacteria and macroalgae, which extract nutrients from the water, or even mangroves for the production of wood. The objective is not only to restore the quality of the effluent water, to the extent that it can be recycled into the aquaculture system, but also to produce a commercial crop from the effluent-treating organisms, e.g. using a bivalve of commercial value.

This developing form of polyculture differs from traditional polyculture in that the complementary species are isolated in different parts of the system.

Similar technology is also being utilized in some countries to 'upgrade' the quality of recycled water to increase its value as a resource in a cost-neutral fashion. Aquaculture recycled water, only previously usable for plantation watering, can be used for horticulture activities.

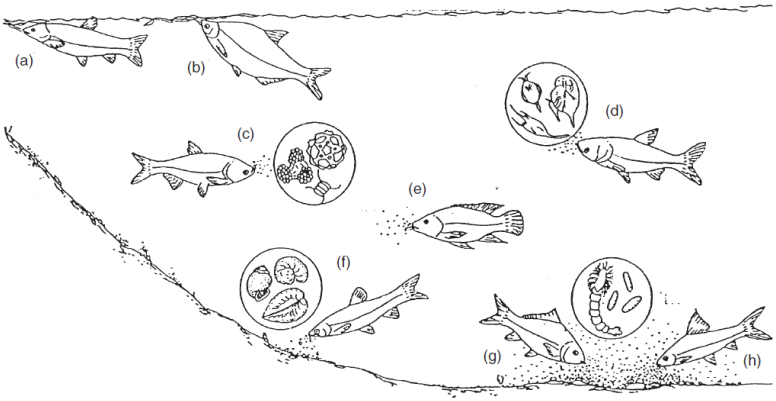


Fig. 1 Natural food resources utilised by major fish species cultivated in Chinese carp polyculture ponds. Grass carp (a) and wuchang fish (b) feed

upon terrestrial vegetation and aquatic macrophytes; silver carp (c) graze upon phytoplankton; bighead carp (d) consume zooplankton; tilapias (e) feed upon both kinds of plankton, green fodders and benthic organic matter; black carp (f) feed on molluscs; and common carp (g) and mud carp (h) consume benthic invertebrates and bottom detritus.

TEXT 6.

Read the text and answer the questions:

Why is fishmeal widely used not only in aquaculture but also in livestock feeds?

How is fishmeal made? What fish is used for fishmeal?

What are the challenges related to fishmeal production?

Fishmeal

Fishmeal is a high quality product widely used in aquaculture and in livestock feeds (especially pig-feed and chicken-feed), as well as horticulture to a limited extent. Feeding fishmeal to ruminants[1] was banned in 2001 in the wake of the Bovine Spongiform Encephalopathy (BSE)[2] scare, however it was reinstated in 2008, and there is some evidence that bovine fertility[3] is increased by its use. It has a wide range of very specific nutritional components, mainly proteins with a very rich amino acid compliment, oils, fibre[4], minerals and vitamins. It is simply made using both whole fish and trimmings[5] from food fish. These are cooked, pressed, dried and milled into a powder form. This product is highly digestible compared to plant-based proteins from, for example soyabeans that are also commonly used in feeds.

On an international basis, most fishmeal consists of small, bony pelagic fish, taken specifically for this purpose. In the EU only around a third falls into this category, the remainder consisting of food fish trimmings – however in the UK, France, Spain and Germany the proportion of trimmings used is much higher. In South America fishmeal is made mainly from anchovy[6] and horse mackerel[7], North America mainly from pollock[8] and menhaden[9], Scandinavia mainly herring[10], capelin[11], sand eel[12], sprat[13] and blue whiting[14], South Africa uses mainly the pilchard[15]. The rest of the world uses a wider variety of fish for their fishmeal. This is therefore a huge component of the world fishing industry.

These fish must be processed rapidly as the rate of decay is high, so many companies use factory ships for this purpose. Where processing occurs on land, very strict environmental monitoring is required as effluent from processing can raise the BOD to unacceptable levels.

There is already concern amongst the industry and the public at large about the health risks associated with pollutants accumulating in fish and shellfish tissues. As a result strict legislation exists in many countries to check quality control systems used by the industry with respect to fish entering the human food chain. However not all nations show the same concern with respect to fish used in fishmeal, though processing may well reduce any potential threat, very little data is available to indicate whether this has been fully analysed.

Coupling this with the simple fact that worldwide fish stocks are already in decline and that the demand for fish for fishmeal as well as for direct consumption is increasing to an unknown degree, perhaps it is time to start thinking about alternatives to supplement this important feed component.

Notes

[1] ruminants – жвачные животные
[2] Bovine Spongiform Encephalopathy (BSE) – губчатая энцефалопатия крупного рогатого скота, «коровье бешенство»
[3] bovine fertility – репродуктивная способность крупного рогатого скота
[4] fibre [ˊfaibə] – волокно
[5] trimmings – обрезки
[6] anchovy [ˊæntʃəvi] – анчоус
[7] horse mackerel – мерлуза, хек
[8] pollock [ˊpɔlək] – минтай, сайда
[9] menhaden [menˊheidən] – менхаден, американская сельдь
[10] herring [ˊheriŋ] – сельдь
[11] capelin [ˊkæp(ə)lm] – мойва
[12] sand eel – песчанка
[13] sprat – салака, тюлька
[14] blue whiting – путассу
[15] pilchard [ˊpiltʃəd] – сардина-пильчард

TEXT 7.

Read the text and answer the questions:

What kind of fish is nelma?
Why did Finland decide to farm nelma?

Other Fish to Fry: Finland to Farm Savory Russian Nelma
29.09.2016

The Nordic countries are renowned for their predilection for fish, such as salmon and trout. Today, Finland is considering the nelma, a Russian whitefish species, as a contender for replacing Norwegian salmon imports.

The nelma, a fish that is native to Arctic rivers throughout Russia's far north, from the Kola Peninsula to Chukotka, is a silver, migratory predator from the Salmonidae family and is well suited to being farmed, the Natural Resources Institute of Finland (Luke) claims. The first nelma spawn was

brought through quarantine from Russia to the Laukaa fishery about six years ago.

The nelma is great," Petri Heinimaa from Luke told Finnish state broadcaster Yle. "It's big, tastes good and is resilient to diseases," he added.

In nature, nelmas, also known as sheefish and inconnu, can grow up to 1.5 meters in length and weigh over 20 kilograms (44 pounds). The only drawback for industrial farming is that nelmas are slow growers and mature rather late. However, patience is rewarding, as the nelma is delicious as a salted fish, as well as both cold and hot-smoked, and would be a welcome addition to the menu of a gourmet restaurant. By Heinimaa's own admission, the high price may be well offset by the nelma's exquisite taste.

"Its tenderness, size and salmon-like greasiness are well worth the high price per kilogram," Heinimaa said.

At Laukaa, nelmas are farmed using whitefish breeding techniques.

"We've done very well with them," Heinimaa said. "All evidence points to the fact that the nelma is a safe import and may become new boon for the industry."

However, it may take a couple of years before the Finnish-bred nelmas reach grocery stores. At present, Finnish law makes it impossible to plant nelma in natural water areas. Permission might be granted, however, as soon as it has been demonstrated that the species does not harm or interfere with any others.

"In Russia the nelma has become more rare in nature, and is somewhat endangered," Risto Kannel from Luke told Yle. "The Russians tried to farm it there because it's a preferred dish. We want Finns to follow suit as well."

The Natural Resources Institute of Finland aims to deliver nelma spawn to independent fish farms, which number some 200 in Finland.

In the 1960s, Norway pioneered salmon aquaculture, which spread quickly to Scotland, Ireland, Iceland, the Faeroe Islands, Canada, the US, Russia and Denmark. Today, Norway remains Europe's largest supplier of farmed fish. In the first six months of 2016, Norway exported seafood worth 42.6 billion NOK ($5.2 billion).

(Source: https://sputniknews.com/business/201609291045822283-russian-fish-finland/)

TEXT 8.

1. Read the article quickly and find English equivalents of the following Russian words and phrases.

1) Смолт, серебрянка (скатывающийся с реки лосось); 2) лосось, готовый для продажи; 3) производство в небольшом объеме; 4) оборудовать; 5) хозяйственный субъект, бизнес-организация; 6) научно-исследовательский и учебный центр; 7) безотходная технология; 8) предприятие, производственный участок; 9) вмещать, включать; 10) собственные технологии повторного использования воды; 11) конверсия корма; 12) эксплуатационные расходы; 13) первостепенный, чрезвычайно важный; 14) производственные объекты; 15) вступать в действие.

Poles Show Potential of Salmon RAS
September 26, 2018

A Polish land based salmon farm has successfully grown several batches of harvest size fish since it was established two years ago.

Global Fish, based near Warsaw, has a 600-tonne capacity recirculation aquaculture system, producing fish from eggs to smolts and up to 5kg marketable salmon. It runs commercially, with a small-scale production for the local market.

The facility has been equipped with Israeli RAS technology from AquaMaof Aquaculture Technologies, which describes the Polish operation as partly an R&D and training centre.

David Hazut, CEO of AquaMaof, said: 'We see significant growth potential in the supply of recirculating aquaculture systems to salmon production companies.

'The investment in Poland will serve two main purposes: first, we are operating this facility as an R&D centre, collecting valuable information and analysing it, for further innovation in the RAS area. Secondly, it serves as a training facility for our customers' staff.'

Global Fish houses multiple RAS rearing units, with tank space ranging from 1–200 m^3, all under strict standard operating procedures, which maximise growth conditions for salmon.

AquaMaof said in a press release that its advanced Zero Discharge Technology utilises proprietary water reuse techniques. And efficient power consumption dramatically reduces the costs of energy.

No antibiotics and no chemicals are used in the process, allowing for the production of a healthy, natural product, said the company.

'Biosecurity is paramount, and complete environmental control ensures that salmon are grown in an environment which promotes the highest health and welfare status.'

Furthermore, an advanced feeding management system enables a reduction in the feed conversion ratio (FCR) and operational costs.

'We are extremely proud of the fact that in such short a time we were able to achieve very good results in growing smolts up to market size salmon, in terms of operation costs, FCR and, not less important, excellent taste and colour of the fish,' said Hazut.

'Apart from the Global Fish facility, we have several additional projects around the world in different stages, for smolt and harvest size salmon production facilities, implementing our proprietary technology, and we expect more projects to commence in the coming months.'

AquaMaof was chosen by Grieg NL to build the world's largest indoor salmon aquaculture facility in Newfoundland. And it is constructing the first RAS salmon farm in Spain.

The company has also established a salmon aquaculture business unit in Scotland, headed by Dr Andrew C Preston.

(Source: https://www.fishupdate.com/poles-show-potential-of-salmon-ras/)

2. Decide if the statements are true (T) or false (F).

1) Global Fish is an Israeli salmon farm.
2) It is built not far from the capital of Poland.
3) The farm is equipped with Norwegian RAS technology.
4) Antibiotics and chemicals are not used on the farm.
5) AquaMaof Aquaculture Technologies is building salmon production facilities in different countries.

3. Complete the sentences with the right words/phrases from the article.

1) Global Fish is a Polish _____.
2) It produces fish from eggs to smolts and up to _____ .
3) The farm sells its fish at the _____ .
4) The farm has been equipped with Israeli _____ .
5) Global Fish houses multiple _____.
6) Very good results on the farm are achieved thanks to advanced ____.
7) Zero Discharge Technology utilises _____ .

8) Efficient power consumption reduces ____.

9) Salmon are grown in an environment which promotes _____.

10) AquaMaof, an Israeli company, also has salmon aquaculture projects in _____, _____ and _____ .

TEXT 9.

Seven Benefits of Having an Aquaponics Garden at Home

The European Parliament research service recently listed aquaponics – the symbiotic cultivation of fish and plants – as one of the ten technologies that could change our lives, producing local food without any chemical fertilisers, writes Robert Woods. (*Robert Woods is the founder of FishKeeping World magazine*.)

Aquaponics is the combined process of aquaculture and soil-less plant growing. It is a sustainable method in which you can grow a full meal, in just one system. Plants and fish grow together symbiotically; fish waste is converted into nitrates, which the plants use as fertiliser, whilst the plants filter and clean the water for the fish.

An in-depth analysis carried out by the European Parliamentary Research Service listed aquaponics as one of the 'Ten technologies which could change our lives'.'

A recent 2018 article 'EU polices: New opportunities for aquaponics' took a closer look at which policies might need to be implemented as the EU develop laws and regulation on aquaponics as a sustainable method for growing food.

Until the EU reach a conclusion on how aquaponics should move forward in terms of commercial viability throughout Europe, for now, having your own garden aquaponics setup can help you to produce local food, ethically and sustainably.

Here are seven benefits to having your own aquaponics system in your garden at home.

Know the source of your food

Growing your own food gives you the added benefit that you'll know exactly where and how the food has been grown. You can select the plants you want to grow, and the fish you want to use in the tanks.

Some popular plants which are easy to grow in aquaponics setups include leafy greens, herbs, tomatoes, peppers and cucumbers.

The fish you choose to include in your tank will depend on whether you want to harvest the fish, or have ornamental freshwater fish. If you want to raise fish to eat, the most common choice is Tilapia.

Reduces food miles

More and more people are starting to question where their food is coming from and the local food movement is really growing as more people start to question the carbon footprint of food miles.

Most of the food available in supermarkets now has a considerable amount of air miles. It's likely the food will have been grown hundreds, maybe even thousands of miles away, and then flown into the local area.

With an aquaponics system, you can source the fish and plant seeds from a reputable source, and grow your own food right there in your back garden.

No chemicals

Another beauty of growing food in an aquaponics system is that it's impossible to cheat and use chemicals or synthetic fertilizers or pesticides.

Because one of the main components in this set up is live fish, if you add anything which could harm the fish to the system, you'll likely kill them and the whole setup won't work.

Therefore this system is one of the most organic and natural ways to grow food.

Uses less water than other food farming methods

Aquaponics uses up to 90 % less water than any other traditional agricultural methods.

This is because 95 % of the water is reused. The water works in a continuous closed loop system, passing through the plants which act as a filtration, cleaning the water.

This removes the need to have the carry out water changes as you would do with regular aquaculture, and also removes the need to water the plants.

Grow food in any sized space

As the world's population is growing, we need to find innovative ways to grow food in small places. Aquaponics fits this description.

Systems can be built vertically, horizontally, stacked on top of one another, pretty much any way to use the available space.

Whether you have a tiny backyard, or a large sprawling garden, you'll be able to design an aquaponics system which you can grow food in.

Sustainable food source

This method of growing food is sustainable for a number of different reasons. It uses less water than other methods because it can continuously recirculate the water. Soil is removed from the equation which means this system is possible to use in areas without nutrient rich soils, and without much water.

All the nutrients which the plants need come from the fish, so it's a completely natural fertilizing method. This system mimics the natural eco-

system, meaning the plants are grown organically, and the quality of the food is much better.

This method produces next to no waste. Any solids which are left over in the fish tanks can be used as natural fertilizers for soil based plants, or added to the compost pile. Any unharvested or damaged plants can be fed to the fish or composted.

Less time consuming than other agricultural methods

If you've always wanted to grow your own food, but have always been put off by the thought of how time-consuming it is, then aquaponics is a great alternative.

Aside from have to feed the fish daily, this system pretty much looks after itself. You won't have to water the plants, or turn any soil. An aquaponics set-up is self-sufficient.

(Source: https://www.euractiv.com/section/agriculture-food/opinion/seven-benefits-of-having-an-aquaponics-garden-at-home/)

TEXT 10.

Challenges of Aquaculture

Like other agriculture production, aquaculture must stand up to a rigorous evaluation of any environmental impact. For example, Salmon aquaculture has come under increasing scrutiny from environmental nongovernmental organizations (ENGOs). In Canada, salmon farming sites occupy a small portion of the coastal zone areas where they are located. The total area occupied by Canadian salmon farms in British Columbia and the Bay of Fundy in New Brunswick is less than 0.01 percent of the coastal area where these sites are located. Still, even though salmon farms occupy only a small percentage of the public waters, scientists have found a significant degradation of the areas where they exist, with lowered oxygen levels, replacement of native seaweeds with invasive seaweeds, increased algal blooms, reduction of wild species, and loss of nursery habitat for wild fish.

Many farmed fish species are carnivorous, meaning that other wild fish species must be harvested in order to maintain the fish farm. For example, herring are used to make salmon feed. Since herring are the backbone of the North Atlantic food chain, increased fishing pressure on their numbers is a serious threat to all other fish species, and other species such as seals, that depend on herring for food. It is argued that fish farms, far from removing the pressure on wild fish stocks, increase it. Others argue that it takes less fish (in the form of the fishmeal component of an aquaculture diet) to produce a unit of table fish through aquaculture than through the natural food web. Fisheries that are based on species lower on the trophic web (such as

many species used for fishmeal) are also more resistant to overfishing than typical table fish fisheries.

The fish farm industry is trying to decrease its reliance on fish for fish feed. The vast majority of aquaculture production on the global scale involves omnivorous species (such as carp, catfish, and tilapia), which can be raised on feeds using very little or no fishmeal. A portion of the fishmeal used in fish feeds for highly carnivorous species comes from the trimmings and discards of commercial species.

More studies are being done concerning shifts in feed composition using poultry and vegetable oils as substitutes for fish protein and oil. However this use of land-based feed ingredients results in a decrease of the Omega 3 fish oils in the farmed fish (although in some cases a 'washing out' of the terrestrial oils can be achieved with a short period of feeding with marine oils prior to harvest). The current reluctance to further reduce fishmeal and marine oils in the commercial diets of species such as the salmonids and shrimps is based not so much on technical difficulties as on consumer resistance to the taste and health qualities of vegetarian fish. In the long term, alternative sources of long-chain Omega 3 fatty acids (the most difficult ingredient to acquire from non-fish sources) may be developed from zooplankton or microalgal origins.

Other problems with aquaculture include the potential for increasing the spread of unwanted invasive species, as farmed species are often not native to the area in which they are being farmed. When these species escape, as tilapia has done in Florida due to flooding, they can compete with native species and damage ecosystems. Another problem is the spread of introduced parasites, pests, and diseases.

While the negative impacts of some aquaculture on the environment have been widely publicized, the positive environmental effects of aquaculture are often overlooked. For example, many aquacultured species are highly sensitive to water quality conditions and aquaculture farmers often notice the effects of pollution or reductions in water quality before other authorities. Aquaculture businesses have a vested interest in clean waterways, in that a reduction in water quality has a direct effect on their production rates and financial profitability. Appropriate aquacultural development can serve as 'canaries' for the health of waterways, with farms often conducting very regular and quite sophisticated monitoring of their aquatic environment.

(Source: http://www.newworldencyclopedia.org/)

GLOSSARY

A

a number of – ряд, некоторое количество
absorb [əb´zɔ:b] – поглощать, впитывать, абсорбировать
acceptable [ək´septəbl] – приемлемый, допустимый
accumulate [ə´kju:mjuleit] – накапливаться
achieve [ə´tʃi:v] – достигать, добиться (чего)
achievements [ə´tʃi:vmənts] – достижения, заслуги
acid [´æsid] – кислота; *fatty acids* – жирные кислоты
address an issue [´iʃu] – решать вопрос
advance [əd´vɑ:ns] – (*v*) продвигать, ускорять
advantage [əd´vɑ:ntidʒ] – преимущество, плюс
~ disadvantage – недостаток, минус
advise [əd´vɑiz] – советовать
aerate [´e(ə)reit] – насыщать воздухом или кислородом
affect [ə´fect] – воздействовать (на что-л.), влиять на…
algae [´ældʒi:] – водоросли
algal bloom [´ælgəl ´blu:m] – цветение воды, вызванное массовым развитием водорослей
allow for [ə´laʊ] – создавать возможность, допускать, позволять
also – также
amino acid composition – аминокислотный состав
ammonia [ə´məʊniə] – аммоний, аммиак
amount of [ə´maʊnt] – величина, количество, содержание (чего)
animal husbandry – животноводство
announce [ə´naʊns] – объявлять, заявлять
annually [´ænjʊəli] – ежегодно
approach [ə´prəʊtʃ] – подход
approve [ə´pru:v] – одобрять, допускать к применению
aquaponics [ˈækwəˈpɒnɪks] – аквапоника
aquarium [ə´kwe(ə)riəm] – аквариум
aquatic [ə´kwætik] – водный
aquatic organisms [ə´kwætik ´ɔ:gəniz(ə)mz] – водные организмы
arable land – пахотная земля
as well as – а также
as with – как и в случае с, по аналогии с
associate [ə´səʊʃi´eit] – сотрудник
association with [ə´səʊsi´eiʃn] – сотрудничество с

at a constant rate – с постоянной скоростью
at the same time – в то же самое время
availability [ə˛veilə´biliti] – наличие, доступность
available (for) [ə´veil(ə)bl] – наличный, доступный, свободный
avoid – избегать, избежать
award [ə´wɔ:d] – (*n*) награда, (*v*) награждать, присуждать премию
award ceremony – церемония награждения

B

backup water supply – резервное/запасное водоснабжение
bacteria [bæk´ti(ə)riə] – бактерии, микробы
bases – (*зд.*) щёлочи
bay – бухта, залив
be notable [´nəʊtəbl] for – славиться (чем), отличаться
because of – из-за
benthic [ˈbenθik] animals – бентосные (донные, придонные) животные
beyond [bi´jɒnd] one's control – не в чьих-л. силах, неподвластный кому
bighead – толстолобик
biofilm [ˈbaiəʊ´film] – биопленка
biofiltration [´baiəʊ´filtreiʃ(ə)n] – биофильтрация, очистка на биологических фильтрах
biological filter [´baiə´lɔʤik(ə)l´filtə] – биологический фильтр
biotechnology [˛baiəʊtek´nɒləʤi] – биотехнология
biotechnology products – биотехнологическая продукция
bloom [blu:m] – цветение (водорослей)
BOD (Biological Oxygen Demand) – биологическая потребность в кислороде, биохимическое потребление кислорода
body of water (water body) – водоём, водный объект
boost – увеличить, существенно повысить
both…and… – и…, и
brackish groundwater – солоноватая подземная вода
break (broke, broken) down – расщеплять (вещество)
breed – (*n*) порода
breed (bred, bred) – разводить
brownfield site – проектная площадка на освоенной территории
by-product [´bai˛prɒdəkt] – продукт пищеварения, побочный продукт

C

cage [keiʤ] – садок (для рыбы)

cage culture – садковое рыбоводство
capacity [kə´pæsiti] – вместимость, объем, мощность, способность
capital cost – капитальные затраты, капитальная стоимость
capture [´kæptʃə] – захватывать, улавливать
carnivorous [ka:´niv(ə)rəs] – плотоядный, хищный
carp – карп
catch (caught, caught) – (вы)ловить, поймать
catch on – быстро улавливать смысл, прекрасно осознавать
catfish – сом
cattle – крупный рогатый скот
cause [kɔ:z] – быть причиной, вызывать
challenge [´tʃælindʒ] – трудность, проблема
chemicals [´kemik(ə)lz] – химикаты
chief executive – президент фирмы
clam – съедобные морские моллюски
cod – треска
coincide [ˌkəʊin´said] with – совпадать с, приходиться на
combine [kəm´bain] – объединять, сочетать
command a better price – продаваться по более высокой цене
common [´kɒmən] – обычный, распространенный
compatible organisms – совместимые организмы
compete – конкурировать
complement each other – дополнять друг друга
complete diet – полноценный рацион
compressed air – сжатый воздух
concede [kən´si:d] – допускать, неохотно соглашаться
conceive [kən´si:v] – задумывать, замышлять
concern [kən´sɜ:n] – (*v*) касаться, иметь отношение; (*n*) предмет беспокойства, проблема, забота
concrete tank – бетонный резервуар/ бассейн
confine [kən´fain] – ограничивать, заключать в…; локализовать
confinement [kən´fainmənt] – содержание в закрытом помещении / в ограниченном пространстве
consume [kən´sju:m] – потреблять, съедать
contaminate [kən´tæmineit] – загрязнять, портить
contamination – загрязнение
contribution – вклад, содействие
contributor [kən´tribjutə] – жертвователь
conventional [kən´venʃ(ə)nəl] – обычный, традиционный

convert [kɒn´vɜ:t] – обращать, превратить, трансформировать; переделывать, преобразовывать
cost [kɒst] – стоимость
crayfish [´krei´fiʃ] – рак, речной рак, лангуст
creature [´kri:tʃə] – создание, творение, живое существо
crustaceans [krʌ´steiʃənz] – ракообразные
cultivate [´kʌltiveit] – выращивать, разводить
culture – выращивать
currently [´kʌrəntli] – теперь, в настоящее время, ныне

D

dairy – молочная ферма
dairy unit – молочный комплекс
damage [´dæmidʒ] – наносить ущерб, вредить
decade [´dekeid] – десятилетие
decline [di´klain] – снижение, сокращение
decompose – разлагать на составные части
decomposer – биоредуктор, редуцент; организм, разлагающий органические вещества
degradation [´degrə´deiʃ(ə)n] – ухудшение
density [´densiti] – плотность, густота, скопление, кучность
depend on [di´pend] – зависеть от (чего)
dependent on – зависящий от
depletion [di´pli:ʃ(ə)n] – истощение (запасов), опустошение
depression – впадина, низина, углубление
detached [di´tætʃt] – отдельный, оторванный, отделённый
determine [di´tɜ:min] – определить, решить, установить; обусловливать,
detritivore – илоед, детритофаг; организм, питающийся детритом
die [dai] – умирать
die-off – вымирание
diet [´daiət] – кормовой рацион
digest [´daidʒəst] – усваивать, переваривать; перерабатывать
dike – дамба, плотина, насыпь
directly – прямо
discard [dis´ka:d] – (*v*) сбрасывать, выбрасывать; (n) отходы, отбросы
disease [di´zi:z] – болезнь
dispose of – избавиться от (чего)
dissolved oxygen – растворенный кислород

diverted [dai´vɜ:tid] river – перехваченная (отклоненная) река; река с измененным руслом
double [dʌbl] – (*v*) удваивать
downstream – нижнее течение реки, нисходящий поток
drain [drein] – выпускать, отводить (воду), осушать до дна
drum filter – барабанный фильтр
dump – сбрасывать
durable [´dju(ə)rəbl] – износоустойчивый, с большим сроком службы
dwindle [´dwindl] – сокращаться, уменьшаться, убывать

E

earn a doctorate – получить степень доктора философии
economics [i:kə´nɒmiks] – экономика
eco-village development – строительство экологического поселения
educate [´edjʊkeit] – просвещать, вести разъяснительную работу
eel – угорь
effect [i´fect] – воздействие, влияние; *have an effect on …*
effluent [´efluənt] – сток, жидкие отходы
egret [´i:grit] – белая цапля
eliminate [i´limineit] – устранять, уничтожать
eliminate the need for – устранить необходимость в (чём)
emphasize [´emfəsaiz] – подчеркивать
enclosed system – замкнутая система
endemic [en´demic] – эндемичный, аборигенный, местный
energy cost – затраты на энергоресурсы
enhance [in´hɑ:ns] – улучшать
enough [i´nʌf] – достаточно
enter the system – поступать (входить) в систему
environment [in´vai(ə)rənmənt] – окружающая среда
environmentally acceptable – экологически приемлемый, допустимый с экологической точки зрения
escape [i´skeip] – убегать, уходить
essential [i´senʃ(ə)l] – необходимый
estuary [´estʃʊ(ə)ri] – устье реки
excess [ik´ses] – излишний, избыточный
excretion [iks´kri:ʃ(ə)n] – выделения, экскременты
exhaustion [ig´zɔ:stʃ(ə)n] – исчерпание, истощение, обеднение (чего)
existence [ig´zist(ə)ns] – существование
existing pond – уже существующий пруд

expand [ik´spænd] – расширять
expectation [ˌekspek´teiʃ(ə)n] – ожидание, надежда, расчет
experience [ik´spi(ə)riəns] – испытывать, переживать
expertise [´ekspɜ:´ti:z] – специальные знания, профессионализм
exploitation [´ekspləi´teiʃ(ə)n] – использование в своих интересах, эксплуатация
extension – продление

F

factory farm – агропромышленная ферма
fail – потерпеть провал, не удаться
farmed fish – искусственно выращенная рыба
favourably [´feiv(ə)rəbli] – одобрительно, хорошо
feed – корм; *feed composition* – состав корма
feed (fed, fed) I – кормить
feed (fed, fed) II – подавать, снабжать, накачивать
feed (fed, fed) **on** smth. II – питаться чем, кормить
feeder fish – живой корм
feeding niche [nitʃ] – пищевая ниша
fence – забор
fertilise – удобрять, вносить удобрения
field [fi:ld] – (*зд.*) область
filter [´filtə] – фильтр
financial investment – финансовые инвестиции
fine [´fain] – мелкий
fingerlings [´fiŋgəliŋ] – фингерлинг (подросшая молодь рыб), сеголеток; молодь рыб (от 2,5 см до размера годовичка)
fish density – плотность косяка рыб (число рыб на кубометр)
fish eggs – икра
fish farming – рыбоводство
fish hatchery – рыбзавод, рыбный питомник
fish lice [lais] – морские рыбьи вши, калигиды
fish-catch – улов рыбы
fishery – рыбохозяйственная организация, рыболовный промысел
fishmeal – рыбная мука
fixed film – фиксированная плёнка
floating [´fləʊtiŋ] – плавающий
floods [flʌdz] – наводнения, паводок, половодье
flow rate – мощность потока, скорость струи

flow-through system – проточная система; прямоточная система водоснабжения
flush out – вымывать, промывать, очищать струей жидкости; очищать напором жидкости, промывать или вымывать (сильной струей воды)
flushing – сбрасывание
food chain – система производства и сбыта продовольственной продукции; (*биол.*) цепь питания (*cf.* food web)
food pellets – гранулированный корм
food security – продовольственная безопасность
food supply – снабжение продовольствием
food web – пищевые связи (в биологическом сообществе)
force – заставлять
forestry – лесное хозяйство
former ambassador – бывший посол
found [faʊnd] – основать
frass – экскременты насекомых
fresh water – пресная вода
freshwater species of fish – пресноводные виды рыб
from a … standpoint – с … точки зрения
fry – мальки рыбы (сформировавшиеся из личинок рыбки)
fund [fʌnd] – (*n*) фонд, капитал; (*v*) финансировать, субсидировать
fungi [ˊfʌŋgi] – грибок;

G

gastrointestinal tract – пищеварительный тракт
generally [ˊʤen(ə)rəli] – обычно, как правило, в общем
gills [ˊgilz] –жабры
GMOs – genetically modified organisms – генетически модифицированные организмы
go vegan [ˊvi:gən] – стать вегетарианцем
grade [greid] – (*зд.*) сортировать
grading – сортировка
grain – зерно
gravel [ˊgrævəl] – гравий
grazer – организм, потребляющий растительную пищу
grower [ˊgrəʊə] – (*зд.*) производитель, фермер
growth nutrient – питательное вещество, необходимое для роста
growth potential – возможности дальнейшего развития

H

habitat – среда обитания
handling – обращение с кем/чем, уход за кем/чем
harbor – гавань, порт
harvest [ˊhɑ:vist] – (*n*) вылов, добыча; (*v*) вылавливать
hatchery fish – рыба, выращенная заводским способом
have control over – осуществлять контроль над
heron [ˊherən] – цапля
herring [ˊheriŋ] – сельдь, сельдевые
hold (held, held) – (*зд.*) проводить (мероприятие)
honour [ˊɒnə] – (*v*) чествовать; (*n*) почет, уважение, почести
however [haʊˊevə] – однако
human development – развитие человеческого общества
hunger [ˊhʌŋgə] – голод
hydroponics [ˊhaidrə(ʊ)ˊpɒniks] – гидропоника

I

idea [aiˊdiə] – идея
immediate [iˊmidiət] – мгновенный, незамедлительный
impact [ˊimpækt] – влияние, воздействие
importance [imˊpɔ:t(ə)ns] – важность, важная роль
in many cases – во многих случаях
in order to – чтобы
in some cases – в отдельных случаях, в ряде случаев
in this case – в этом случае
in turn – в свою очередь
include [inˊklu:d] – включать
including – включая
increase [inˊkri:s] – увеличивать
individual [ˌindiˊvidʒʊəl](*n*) – личность, индивидуум, отдельное лицо
inefficiency [ˊiniˊfiʃ(ə)nsi] – неэффективность, бесполезность
inherent [inˊhi(ə)rənt] – изначальный, неизбежный, характерный
initially – сначала
inshore – прибрежный, находящийся на берегу
inspire [inˊspaiə] – воодушевлять, стимулировать
instead of [inˊsted] – вместо, взамен
integrate [ˊintigreit] – включать в состав
intensify [inˊtensifai] – усиливать, активизировать
interbreed – скрещиваться

intestinal worm – глист, кишечный червь / гельминт
into the bargain – в придачу, помимо того, к тому же
invasive [in´veisiv] – инвазивный, чужеродный
invertebrate feeder – организм, питающийся беспозвоночными
involve [in´vɒlv] – включать в себя, предусматривать
involved in – связанный с
involvement [in´vɒlvmənt] – вовлечение, привлечение, приобщение
irrigation ditch – арык, оросительная канава
It is believed that – Полагают, что…
it takes – требуется, нужно

J (K)

juvenile [´ʤu:vənail] fish – рыбная молодь, мальки рыб

L

labor (labour BrE) [´leibə] – рабочая сила, рабочие
large-scale marketing – реализация продукции в крупных масштабах
laureate [´lɒriət] – лауреат
lead [li:d] (led, led) **to** – приводить к (чему)
leaf (*sg*)/leaves (*pl*) – лист / листья
lease [li:s] – сдавать в аренду
level – уровень
likewise – аналогично
link – звено, связь
liquid oxygen [´likwid´ɒksiʤən] – жидкий кислород
live [laiv] – живой
livelihood [´lɑivlihʊd] – средства к существованию, жизнедеятельность

M

magnify [´mægnifai] – увеличивать
maintain [mein´tein] – поддерживать, сохранять; обеспечивать
make a mess – мусорить, производить беспорядок
manage [´mæniʤ] – регулировать, контролировать, управлять; справиться с (чем), одолеть
management structure – управляющая структура
manmade system – искусственная система
manufactured diet – искусственный рацион
manufacturing [ˌmænju´fækt(ə)riŋ] – производство
manure – навоз

marine aquaculture – аквакультура в морских водах
market – (*v*) продавать, сбывать; (*n*) рынок (сбыта)
market size – (*рыб.*) товарный размер
marketing options [ˊɒpʃ(ə)nz] – варианты сбыта продукции
marketing position – положение на рынке
mean (*v*) – значить, означать, подразумевать
means (*n*) – способ, средство / средства
mechanical filter [miˊkænik(ə)lˊfiltə] – механический фильтр
meet a need – удовлетворять потребность
mollusk [ˊmɑ:ləsk] – моллюск
mop up – ликвидировать, уничтожать
mound – насыпь, холм, кочка
movement [ˊmu:vmənt] – движение, перемещение
mulberry tree – тутовое дерево
mullet [ˊmʌlit] – кефаль
multiple [ˊmʌltip(ə)l] harvests – (*зд.*) многократный вылов
mussel – мидия

N

native to – присущий, обитающий в
natural food – естественный корм
natural process [ˊnætʃ(ə)rəl ˊprəʊsəs] – естественный процесс
natural source [sɔ:s] – естественный (природный) источник
net – сеть
neutralize [ˊnju:trəlaiz] – нейтрализовать
nitrates [ˊnaitr(e)its] – нитраты
nitrification [ˊnaitrifiˊkeiʃ(ə)n] – нитрификация (биохимическое окисление азота аммония до нитратов анаэробными бактериями)
nitrification [ˊnaitrifiˊkeiʃ(ə)n] – нитрификация (биохимическое окисление азота аммония до нитратов анаэробными бактериями)
nitrifying (nitrification) bacteria – азотовыделяющие / нитрифицирующие бактерии
nitrifying (nitrification) bacteria – нитрифицирующие бактерии
nitrite [ˊnaitrait] – нитрит
Nobel Peace Prize – Нобелевская премия мира
nursery habitat – (*ихт.*) выростной участок
nutrient [ˊnjutriənt] – питательное вещество
nutrition [njuˊtriʃən] – питание, пища, питательность
nutritional [nju:ˊtriʃ(ə)nəl] – питательный

O

object to [ɒb´ʤekt] – возражать, не одобрять
occur [ə´kɜ:] – случаться, происходить, возникать, появляться
occupy [´ɔkjupai] – занимать (территорию)
officially [ə´fiʃəli] – официально
offshore – в направлении от берега к морю, в открытом море
oil – жир; *fish oil* – рыбий жир
organize [´ɔ:gənaiz] – организовать
ornamental fish – декоративная рыба
otter [ɒtə] – выдра
outdoor activity centre – центр активного отдыха
overhead netting – накладные (верхние) сети
overuse [ˌəʊvə´ju:s] – злоупотреблять, чрезмерно использовать
oxygen [´ɒksiʤən] – кислород
oxygenation [ɔk´siʤə´neiʃ(ə)n] – обогащение / насыщение кислородом
oxygenation [ɔk´siʤə´neiʃ(ə)n] – обогащение / насыщение кислородом
oyster – устрица
oyster reef – устричный риф
ozone [´əʊzəʊn] – озон

P

pad filter – микросито
paddle wheel [´pædlwi:l] – водоподъемное колесо, колесо с лопастями
paddy field –затопляемое рисовое поле (*also*: rice paddy)
parasite [´pærəsait] – паразит
partially [´pɑ:ʃ(ə)li] – частично
particulate [pɑ:´tikjʊlət] – частица
pass to – переходить к..., поступать в…
pathogens [´pæθəʤən] – болезнетворный организм, патоген
pelagic algae [pe´læʤik ´ælʤi] – пелагические водоросли
pellets – кормовые гранулы
perch [pɜ:tʃ] – окунь
persuade [pə´sweid] – убеждать, склонять, уговаривать
pharmaceutical [ˌfa:mə´sjutikəl] – фармацевтический
pharmaceutical products – фармацевтические препараты
philanthropist [fi´lænθrəpist] – филантроп, благотворитель
phytoplankton [´faitəʊˌplɑŋ(k)t(ə)n] – фитопланктон, растительный планктон;
pigsty [´pigstai] – свинарник

pioneer [ˌpaiəˊniə] – положить начало, быть инициатором
place – (*v*) поместить, расположить
plant species – виды растений
plastic beads [bi:dz] – пластмассовые шайбы
plastic liner/lining – пластмассовое покрытие
political leadership – политическое руководство
pollution [pəˊlu:ʃən] – загрязнение
pond culture – прудовое хозяйство, прудовое рыбоводство
pose hasard [ˊhæzəd] to smth. – представлять опасность
poverty alleviation [ˊpɔvəti əˌli:viˊeiʃn] – снижение уровня бедности
practical experience – опыт практической работы
prawn [prɔ:n] – креветка
prawn [prɔ:n] – креветка
predation [priˊdeiʃ(ə)n] – хищничество, хищническое истребление; истребление хищниками
prevent from [priˊvənt] – препятствовать, мешать; предотвратить
primarily [ˊpraim(ə)rəli] – главным образом
processing [ˊprəʊsesiŋ] – переработка
production [prəˊdʌkʃ(ə)n] – производительность
profitable [ˊprɔfitəb(ə)l] – рентабельный, выгодный
proper [ˊprɔpə] – надлежащий, правильный, должный
protein [ˊprəʊti:n] – белок;
protozoa [ˊprəʊtəˊzəʊə] – простейшие животные организмы, одноклеточные животные организмы, протозоа;
provide [prəˊvaid] – обеспечить, гарантировать, позволять
provide protection from – обеспечить защиту от
pump [pʌmp] – подавать воду насосом, накачивать насосом; накачивать, нагнетать
pupa(*sg*.) / pupae (*pl*) – куколка
purge [ˊpɜ:ʤ] – очищать
purify [ˊpjʊrifaɪ] – очищать
purity [ˊpjʊ(ə)riti] – чистота, отсутствие примесей;

Q

quality [ˊkwɔliti] – качество;
quantity [ˊkwɒntiti] – количество, величина;

R

raceway – проточный канал (для разведения рыбы), рыбоходный канал

raceway system – система каналов
railway station – железнодорожный вокзал
raise (fish) – выкармливать, разводить; выращивать (рыбу)
rather than – а не
ravage [ˊrævidʒ] – разорять, опустошать
rear – разводить, выращивать
rearing tank – выростной бассейн / резервуар
receive [riˊsi:v] – принимать
receiving body of water – водоприёмник
recirculating (aquaculture) system (RAS) – установка замкнутого водоснабжения (УЗВ); замкнутая рыбоводная система
recirculation system – система замкнутого водоснабжения (УЗВ)
recognize [ˊrekəgnaiz] – признавать
recreational fishing – любительское рыболовство
recycle [ri:ˊsaik(ə)l] – перерабатывать
recycling system [riˊsaikliŋ ˊsistəm] – система рециркуляции
reduce – уменьшать
refer to [riˊfɜ:]– относиться к; означать
regarding [riˊga:diŋ] – относительно, касательно, что касается
regardless of – независимо от, вне зависимости от
reinforced concrete – армированный бетон, железобетон
related to – связанный с, относящийся к
release [riˊli:s] – высвобождать, выпускать, сбрасывать
remove [riˊmu:v] – очищать, устранить, удалить
removal – устранение, удаление
replacement – замена
require [riˊkwaiə] – испытывать необходимость в, требовать
requirement [riˊkwɑiəmənt] – требование, потребность
responsible for – ответственный за
result from – получаться в результате, быть результатом (чего)
reuse – повторно применять
role model – пример для подражания
root – корень
rotating screen – вращающееся сито
routine [ru:ˊti:n] – заведенный порядок, образ жизни, повседневность
ruin [ˊru:in] – разрушать, уничтожать, губить
run (ran, run) – (*v*) (*зд.*) управлять
run the system – управлять системой
runoff – сток, отходы

S

salmon [ˊsæmən] – лосось
Salmonidae – лососёвые
same [seim] – тот самый, тот же самый
sawmill – лесопильный завод
scare away – отпугнуть, распугать
science [ˊsaiəns] – наука
scope [skəʊp] – масштаб, область действия, объём и содержание
scrutiny [ˊskru:tini] – внимательное рассмотрение, изучение; *come under scrutiny* – привлечь пристальное внимание, попасть в поле зрения
sea bass – окунь морской
sea bream – морской лещ
seal [si:l] – тюлень
senior management – высший руководящий состав
sentient [ˊsenʃ(ə)nt] – наделенный чувствами, ощущающий, сознающий
separate [ˊsep(ə)rit] – отдельный
settle out – выпадать в осадок, осаждаться, осаждать
settling basin – отстойник, отстойной бассейн
settling tank – резервуар-отстойник, осадочный бассейн
several [ˊsev(ə)rəl] – несколько
shellfish farming – разведение моллюсков
shredded plastic – пластмассовый заполнитель (измельченный пластик)
shrimp – креветка
simultaneously [sim(ə)lˊteiniəsli] – одновременно
sluice [slu:s] gate – шлюзные ворота, щитовой затвор (шлюза)
smitten [smit(ə)n] – пораженный, загрязненный
snail [sneil] – улитка
so long as – при условии, что; пока; если
solely [səʊlli] – исключительно, только, единственно
solid waste – твердые отходы
soluble – растворимый
solution. [səˊlu:ʃ(ə)n] – решение
sophistication [səˊfistiˊkeiʃ(ə)n] – сложность
space – пространство
species [ˊspi:ʃi:z] – вид (биологический)
sport fish – рыба, ловимая с катера рыболовами-спортсменами
spread (spread, spread) [spred] – (*v*) распространять, (*n*) распространение
spring – родник, источник
spring water – ключевая / родниковая вода

state – (*v*) заявить, заявлять, утверждать
still – всё еще; по-прежнему
stock – запас
stock restoration – восстановление запасов рыбы
stock streams – (*v*) зарыблять ручьи (реки)
stock watering – водопой для скота
strain – напряжение
stream [stri:m] – река, речка, ручей
subsequently – впоследствии
successfully – успешно
such as – такой как, такие как
sufficient [sə´fiʃ(ə)nt] – достаточный
sump [sʌmp] – водосборный колодец, отстойник
supplemental income – дополнительный доход
supply [sə´plɑi] – снабжение, поставка
supporting medium [sə´pɔ:tiŋ´mi:diəm] – подложка, опорная среда, поддерживающая среда
surface [´sɜ:fis] – поверхность
surface area – суммарная поверхность
sustainable [sə´stein(ə)bl] – экобезопасный, устойчивый
symbiotic [ˌsimbi´ɒtic] – симбиотический
symposium [sim´pəʊziəm] – симпозиум

T

table fish – съедобная рыба, промысловая рыба
take into account – принимать во внимание
tank – бассейн, резервуар
taro plant – таро, колоказия съедобная
technique [tek´ni:k] – рабочий прием, техника выполнения, методика;
technology [tek´nɒlədʒi] – технология
terrific – ужасающий, потрясающий, колоссальный
that is – то есть
the number of – число, количество (чего)
therefore [´ðeəfɔ:] – поэтому
threat [θret] – угроза
tilapia – тилапия
too – слишком
toxicity [tɒk´sisiti] – токсичность, ядовитость
transparent [træs´pærənt] – прозрачный, светопроницаемый

treat fish disease – лечить болезни рыб
treat parasites/the water – подвергать обработке паразитов/воду
treatment – обработка, лечение
tremendous [tri´mendəs] – огромный, гигантский
trimmings [´trimiŋz] – обрезь, отходы при обрезке
trophic web [´trɔfik, trəʊfik] – трофические/пищевые связи пищевая сеть
trout – форель
truck – перевозить на грузовиках
try [trai] – испытывать, испробовать

U

ultraviolet light [´ʌltrə´vaiəlit´lait] – ультрафиолетовый свет;
undigested [ˌʌnd(a)i´ʤestid] grain – непереваренное зерно
usable [´ju:zəb(ə)l] – пригодный для использования
utilize [´ju:tilaiz] – использовать, утилизировать

V

variety [və´raiəti] – вид, разнообразие
vast [va:st] – огромный, громадный
vegetable [´veʤ(i)təbl] – овощ
vested interest – кровный интерес, личная выгода
via [´vaiə] – с использованием, через посредство
viable [´vɑiəb(ə)l] – жизнеспособный, разумный
virus [´vai(ə)rəs] – вирус, возбудитель инфекционной болезни
vulnerable [´vʌln(ə)rəb(ə)l] – легко повреждаемый, незащищенный

W (X)

waste [weist] – отходы
water body – водоём
water column [´kɒləm] – водная толща
water environment – водная среда
water purity – чистота воды
water quality – качество воды
water source – источник водоснабжения/воды
water supply – подача воды, водоснабжение
well – колодец
well water – вода из подземного источника (скважины), колодезная вода
whether [´weðə] – ли

while [wail] – в то время как, пока;
wild fishery – вылов диких рыбных ресурсов
wild populations – популяции в дикой природе
wild-caught fish – промысловая рыба; рыба, выловленная в природной среде
World Food Prize – Всемирная продовольственная премия

Y

year round production – круглогодичное производство
yellowfish – усач, барбус, пунтиус
yellowtail – желтохвост
yield [ji:ld] – количество добытого или произведенного продукта

Z

zooplankton [ˊzu:ə(ʊ)ˌplɑŋ(k)t(ə)n] – зоопланктон

Irregular Verbs in the Past Tense and Past Participle

Infinitive / Present Tense	Past Tense (V_2)	Past Participle (V_3)	
be (am, are, is)	was, were	been	быть
bear	bore	born, borne	нести, носить
beat	beat	beat, beaten	бить, ударять
become	became	become	стать, становиться
begin	began	begun	начать, начинать
bend	bent	bent	гнуть, сгибать; наклоняться
bet	bet	bet	держать пари
bind	bound	bound	вязать, связывать
bleed	bled	bled	кровоточить
blow	blew	blown	дуть, веять
break	broke	broken	ломать, разбивать
breed	bred	bred	разводить, размножаться
bring	brought	brought	приносить, приводить
build	built	built	строить
burn	burned, burnt	burned, burnt	жечь, сжигать
buy	bought	bought	купить, покупать
can	could	–	мочь, смочь; уметь
catch	caught	caught	ловить, поймать, схватить
come	came	come	приходить, приезжать
choose	chose	chosen	выбирать, выбрать
come	came	come	приходить, приезжать
cost	cost	cost	стоить
creep	crept	crept	ползти, ползать
cut	cut	cut	резать
dig	dug	dug	копать, рыть, выкапывать
do	did	done	делать, сделать
draw	drew	drawn	тащить, волочить, тянуть
drink	drank	drunk	пить
drive	drove	driven	ездить, водить машину
eat	ate	eaten	есть, съесть
fall	fell	fallen	падать
feed	fed	fed	кормить, давать пищу
feel	felt	felt	чувствовать, ощущать
fight	fought	fought	бороться, сражаться, драться
find	found	found	найти, отыскивать
fly	flew	flown	летать
forget	forgot	forgot, forgotten	забывать, забыть
forgive	forgave	forgiven	простить, прощать
freeze	froze	frozen	замерзать, замораживать
get	got	got, gotten	получать, доставать

give	gave	given	давать, дать
go	went	gone	идти, ходить, ехать,
grow	grew	grown	расти, выращивать
hang	hung	hung	вешать, подвешивать
have, has	had	had	иметь
hear	heard	heard	слышать
hide	hid	hidden	прятать, спрятать
hit	hit	hit	ударять
hold	held	held	держать, удерживать
hurt	hurt	hurt	причинять боль
keep	kept	kept	держать, хранить
know	knew	known	знать
lay	laid	laid	класть, положить
lead	led	led	вести, показывать путь
leap	leaped, leapt	leaped, leapt	прыгать, скакать, пере-прыгивать
leave	left	left	покидать, оставлять, уходить
lend	lent	lent	давать взаймы
let	let	let	позволять
lie	lay	lain	лежать
light	lit, lighted	lit, lighted	светить, освещать, зажи-гать
lose	lost	lost	терять, потерять
make	made	made	делать, изготавливать
may	might	–	может, мочь, иметь воз-можность
mean	meant	meant	значить, иметь в виду
meet	met	met	встречать, знакомиться
pay	paid	paid	платить
put	put	put	класть, ставить, поме-щать
read	read	read	читать
ride	rode	ridden	ехать верхом
ring	rang	rung	звонить
rise	rose	risen	вставать, подниматься, расти
run	ran	run	бежать, бегать
say	said	said	говорить, сказать
see	saw	seen	видеть
sell	sold	sold	продавать
send	sent	sent	посылать, послать
set	set	set	ставить, помещать, класть, устанавливать
shake	shook	shaken	трясти
shine	shone	shone	светить, сиять, блистать
shoot	shot	shot	стрелять, выстрелить

show	showed	shown	показывать, показать
shut	shut	shut	закрывать, закрыть
sing	sang	sung	петь
sink	sank	sunk	тонуть, утопать; погружать
sit	sat	sat	сидеть
sleep	slept	slept	спать
smell	smelled, smelt	smelled, smelt	пахнуть; обонять, чувствовать запах
speak	spoke	spoken	говорить, разговаривать
speed	sped	sped	проноситься, превышать скорость
spend	spent	spent	тратить (деньги), проводить время
spread	spread	spread	распространять (ся)
spring	sprang	sprung	вскакивать, вскочить с места
stand	stood	stood	стоять
steal	stole	stolen	воровать, красть
stink	stank, stunk	stunk	вонять, смердеть
swear	swore	sworn	клясться, поклясться; ругать(ся)
swim	swam	swum	плавать
take	took	taken	брать, взять
teach	taught	taught	учить, преподавать, обучать
tear	tore	torn	рвать, разрывать
tell	told	told	рассказывать, говорить, сообщать
think	thought	thought	думать
throw	threw	thrown	бросать, кидать, швырять
understand	understood	understood	понимать, понять
wake	woke	woken	просыпаться, будить
wear	wore	worn	быть одетым, носить одежду
win	won	won	выиграть, победить
write	wrote	written	писать, написать

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