中国商业高等职业教育研究会统编
21世纪高等教育系列教材（粮食工程专业）

粮食工程专业英语

总主编　毛新成
主　编　孙卫东

西南交通大学出版社
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内容提要

本书是面向粮食工程专业高职生的国内第一本《粮食工程专业英语》教材。本教材充分体现了与《粮食工程教学计划及教学大纲》的一致性以及职教性、教学等级性、现实性与前瞻性。

全书共由16个单元组成。第1单元介绍食品的主要成分及其营养作用；第2单元介绍小麦的籽粒结构及每一个组成部分的含量；第3单元介绍粮食储藏的历史、意义及相关运输工具；第4单元介绍水分对于粮食储藏的重要影响及各种粮食作物的安全水分；第5单元介绍制粉工艺；第6单元介绍一种制粉设备——对辊磨粉机；第7单元概述中国的粮食形势及中国对世界粮食市场的影响；第8单元介绍一种现代粮食交易工具——粮食期货；第9单元介绍转基因工程对于粮食生产的影响；第10单元介绍饲料配方的意义及配制过程；第11单元介绍饲料的混合及制粒工艺；第12单元介绍大米加工工艺；第13单元介绍衡量各种粮食劣变的指标；第14单元介绍粮食输送的各种设备及其运输特点；第15单元介绍粮食粉碎设备的分类及工作原理；第16单元介绍对未来世界粮食加工行业的一种展望。

本书主要针对高中后三年制高职和初中后五年制高职的学生编写，同时也可供粮食工程人员和粮食贸易人员参考之用。

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中国商业高等职业教育研究会教材建设委员会

编写说明

近年来，随着我国国民经济的突飞猛进，高等职业教育也得以迅速发展。如今，高职教育已成为我国高等教育的一个重要分支。虽然高职教育的目标及其地位已得到社会各界的明确肯定，但由于其发展的时间较短，许多模式仍在探索之中，其中教材建设就是一个突出的问题。

目前，中国商业高等职业教育发展迅猛，但相应的商业高职教材却未形成完整的体系。由于商业高职教育教材缺乏，导致许多商业高职院校只能选用本科或大专层次的教材。尽管目前已经出版了一些匆匆编写的教材，但往往都是本科教材的压缩，未能真正体现高职教育的特点。据此，中国商业高等职业教育研究会根据高职教育的目标和特点，于2002年研究制定了14个专业的教学计划，并于2003年制定了8个专业共95门主干课的教学大纲。从2004年起，中国商业高等职业教育研究会开始组织编写“财务会计”、“市场营销”、“旅游管理”、“电子商务”、“计算机应用”和“粮食工程”六个专业共56门主干课教材(现已陆续出版)。编写这一系列商业高职教材的总体要求是：①教材应充分体现高职教育的特点，以职业岗位要求的专业知识和业务能力来决定课程内容，着重理论的实际应用，不过分强调理论的系统性、完整性；②着重对与职业岗位相关的知识和业务水平进行培养，并加强课程实训；③同时，教材编写中应注意中职与高职的差别与衔接，以及与高等教育和中等职业教育的差别。该批教材的编写人员，均是从教多年、具有丰富教学经验和专业知识的教师，以及工作多年具有丰富实践经验和专业知识的技术人员，从而保证了该批商业高职教材具有相当的专业水准，内容丰富，知识全面、新颖。经审定，该批教材不仅可作为商业高职院校教材，也可作为相关职业培训教材，并可供相关技术人员参考。

该系列商业高职教材出版后，我们殷切希望各高职院校在使用过程中不断提出宝贵意见，以使教材日臻完善，进一步适应高等职业教育人才培养的需要。

中国商业高等职业教育研究会

2006年3月

前　言

众所周知，我国加入WTO后，随着我国经济与全球经济一体化进程的加速，我国经济已经融入了世界经济的大潮，并已成为世界经济的一支重要力量。但是，我们必须承认，我国与西方经济强国的差距还很大，为了缩短这种差距，我国不仅要主动地参与国际竞争，而且在竞争中，要谦虚谨慎，戒骄戒躁，不断地学习竞争对手的成功经验，充分发挥我们的“后发优势”。然而要实现这一目标，不懂外语显然不行。外语是我们及时获取国外信息资料、迎头追赶先进国家的通行证，外语是我们与别国进行信息交流和商业合作的沟通媒介，也是我们更加积极主动地应对国际竞争的一种工具。

对于我国粮食工程人员来说，英语的重要性非常突出。在世界众多的语种里，英语最具强势特征，英语是世界上最为流行的语言。目前，我国的粮食加工业正面对前所未有的发展机遇，一批具有先进的生产、技术、管理、经营等能力的跨国粮油企业正陆续登陆我国，而我国也有一批具有创新精神的粮油加工企业开始走出国门，但在这种“与狼共舞”的竞争与合作中，我国粮油加工业也遇到了不少严峻的挑战。例如，怎样更快地了解、掌握国外先进的技术与设备？怎样更好地了解国际竞争游戏规则？怎样从容地应对各种贸易壁垒和技术壁垒？如此等等，都需要我国粮油加工企业与国外企业进行密切地接触、交流、谈判、合作，而在这些活动中，英语作为一种最主要的交流媒介，必不可少。

为了向我国粮食加工业输送企业急需的既懂专业又懂英语的合格人才，在中国商业高等职业教育研究会的指导和组织下，我们编写了这本面向粮食工程高职生的国内第一本《粮食工程专业英语》教材。在编写过程中，教材严格遵循《粮食工程专业高职教学计划》和《粮食工程专业英语编写大纲》，充分体现了与计划及大纲的一致性以及职教性、教学等级性、现实性与前瞻性。在内容上，教材既涵盖了传统的粮食加工工艺与设备，包括米、面、饲料三个方向，也包括了极具时代特征的转基因食品、粮食期货等内容。教材中的每个单元，不仅包括一篇内容实用、语言规范的课文，而且还包括词汇、注释、练习、补充阅读等内容。全书由16个单元和4个附录组成，附录包括课文参考译文、阅读材料参考译文、练习及阅读材料参考答案、词汇表。

本书主要针对高中后三年制高职和初中后五年制高职学生编写，同时也可供广大粮食工程人员和粮食贸易人员参考使用。

本书第5、7、15单元由江苏财经职业技术学院孙卫东副教授编写，第9、10、11

单元由江苏财经职业技术学院宋砚清编写，第1、2、3单元由河北商务科技学校吴立春编写，第4、6单元由河北商务科技学校冯英巧编写，第8、12、14单元由贵州省贸易经济学校李若楠编写，第13、16单元由贵州广播电视大学李荣祥编写。全书由孙卫东担任主编，吴立春、李若楠担任副主编，武汉工业学院食品与生物工程学院院长何东平教授担任主审。

因编者水平有限，本书缺点和不妥之处在所难免，敬请读者批评指正，电子邮箱 dragoninmainland@yahoo.com。

编　者

2006年3月

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Unit 1

The Main Components of Foods

Food is composed of three main groups of constituents: carbohydrates, fat and proteins. In addition, there is a group of inorganic mineral components and a group of organic substances present in comparatively small proportions:[1]

CARBOHYDRATES

To this class of compounds the sugar belong. Sugar are soluble substances of which the best known is the common sweet substance "sugar", a compound molecule technically known as sucrose and composed of glucose and fructose[2]. Maltose, a compound molecule composed of two glucose units, is formed when grains germinate; and lactose, another compound molecule, occurs in milk. Starches are also carbohydrates. As has already been mentioned, they have very much large compound molecules and are the form in which plants store food for themselves in their seeds and other storage organs. Although the starches from diverse grains and from potatoes and other plants are basically the same, the structure and conformation of the polymer chains of which they are composed differ in detail[3]. These differences become apparent in practice when they are processed.

Starch is a major component of cereals and of roots and tubers. There is another form of starch that occurs in animals, glycogen. Like the starch in seeds, it functions as a fuel-storage material in the living animal. Liver contains comparatively large amounts of glycogen. As do horse-meat and oysters.

Sugars are soluble in water and readily form syrups; starches are not, as a general rule, soluble at all. There are, however, compounds midway in molecular size between the one-or two-glucose length of simple sugars and the very large, polymer structure of starches. These compounds are dextrin. They occur in nature-in malt, for example-but they are more commonly recognized when produced during food processing: the brown substances that arise when bread is turned into toast are dextrin. The gum on postage stamps is usual dextrin.

PROTEINS

Carbohydrates are basically fuels-first, for the living plants in which they are formed and, later on, for animals and men. While the structure of starch grains is more complex than the comparatively simple chemical molecules of sugars, nevertheless it is less intricate by far than the elastic substance of animal muscle of even than the gluten fiber of wheat, the rubbery casein of cheese or the gelatinous substance of egg white. These are all proteins.

Consider meat as an example. It is mainly muscular tissue, strong, contractile yet

destructible if wrongly handled. Like the artificial "plastics" that have now been invented to be like it, it is a polymer, but a much more complex one than starch or cellulose.

The polymer chains of starch are made up of links, each of which is the same. They are, as I have said above, each one a glucose unit. Proteins, however, which are more versatile structures, are polymer chains made up with a varied collection of more than twenty different substances, called amino acids, as links. These units, although they are all different, are similar in general design and all possess the peculiarity of containing one or more nitrogen atoms. The separate links of an amino-acid chain out of which the protein molecule is formed are connected by way of the nitrogen atom. Some of the amino acids also contain a sulphur atom and this allows protein chains to become attached to one another, side by side, in much the same way as the separate strands of a rope that are twisted together can also have cross fiber tangled across from one to another.

FAT

The food technologist can usually recognize fat when he sees them because they are quite different both in their physical properties and in their chemical composition from the other two main food constituents, carbohydrate and protein. Unlike the starch grains, which form the main carbohydrate fraction, and even more unlike the muscle fiber of meat or even the gluten strands in bread, two examples of protein that have already been mentioned, fat possess no structural form. Fat is, indeed, primarily a fuel source, either for the animal or plant in which it originally occurs, or for the man who eats the food in which it subsequently forms a part. A slice of break possesses an obvious and characteristic structure, the butter smeared on it does not.

We recognize fat when we see it as a smooth, greasy substance. There are a number of different fat which differ primarily from each other in the temperature. Fat that is liquid at the normal climate temperature at which one happens to live is by convention called oil, but the chemical compositions of fat and oils are similar and the same fat in Europe may be oil in Africa just as oil in Europe may be fat in Alaska.[4]

VITAMINS

There are present in most foods a number of organic components which may not seem to be of direct interest to the food technologist so far as the apparent quality of the foodstuff is concerned. These substances, however, are of great importance to the nutritional value of the diet as a whole. Although they may be present only at the level of a few parts per million, their absence from the diet would lead to malnutrition, deficiency disease and ultimately death.

Vitamins can be conveniently classified into two groups:

(1) Water-soluble vitamins, notably a group of vitamin B, fairly widely distributed in grain products, meat, milk, potatoes and vegetables, and vitamin C, which is largely restricted to fruit and vegetables.

(2) Fat-soluble vitamins, including vitamin A, present in fish, egg and milk; yellow pigments which possess vitamin A—activity found in carrots, yellow maize, green vegetables, palm oil, sweet potatoes and a number of other foods; and vitamin D is found in milk, fish oils and in some other fatty substances that have been irradiated either by sunlight or artificially.

MINERAL COMPONENTS OF FOOD

Foods contain in small amounts a comparatively long list of mineral components. These include:

(1) Calcium compounds. Calcium phosphate is a component of bone and, occurs also in milk. Calcium from milk becomes concentrated in cheese and in dried milk. Fish may also be a significant source of calcium phosphate.

(2) Iodine. An element that is of considerable importance for health and that is also present in sea fish. The absolute amounts of iodine present are exceedingly small, but so is the quantity required in a good diet.

(3) Iron is a further necessary mineral occurring in foods; it is present in meat and in a specially available form in liver. Vegetables also supply significant amounts. Iron is notably lacking in milk.

(4) Salt. The mineral combination present in largest amount in foodstuffs is salt. In chemical terms, this is sodium chloride. Although it is present naturally in a number of foods, salt is for the most part added, for example, in cooking and food processing, in making bread, and in making cheese.

New Words and Phrases

constituent[kən'stitjuənt] n. 成分
carbohydrate[ˌka:bəu'haidreit] n. 碳水化合物;[pl.]淀粉质食物
inorganic[inɔ:'gænik] a. 无生物的,无机的
soluble['sɔljubl] a. 可溶的,可以解决的
sucrose['sju:krəus] n. 蔗糖
glucose['glu:kəus] n. 葡萄糖
fructose['frʌktəus] n. 果糖,左旋糖
maltose['mɔ:ltəus] n. 麦芽糖
germinate['dʒə:mineit] vt. &vi. (使)发芽,开始生长
lactose['læktəus] n. 乳糖
starch[stɑ:tʃ] n. 淀粉
diverse[dai'və:s] a. 不同的,相异的,多种多样的
conformation[kənfɔ:'meiʃən] n. 符合,形态
polymer['pəlimə] n. 聚合物,多聚物
tuber['tju:bə] n. 块茎,结节
glycogen['glikəudʒən] n. 糖原,动物淀粉
liver['livə] n. 肝,肝脏
oyster['ɔistə] n. 牡蛎,蚝
exertion[ig'zə:ʃən] n. 费力,劳顿
syrup['sirəp] n. 糖浆,果汁
dextrin['dekstrin] n. 糊精
malt[mɔ:lt] n. 麦芽
toast[təust] n. 烤面包;vt. 烘,烤
intricate['intrikit] a. 复杂难懂的
gluten['glu:tən] n. 谷糠,面筋,麸质
casein['keisi:in] n. 酪蛋白
gelatinous[dʒi'lætinəs] a.

含凝胶的，胶冻状的
contractile[kən'træktail] a. 可收缩的
destructible[dis'trʌktəbl] a. 可破坏的，可消灭的
cellulose['seljuləus] n. 纤维素
nitrogen['naitridʒən] n. 氮
sulphur['sʌlfə] n. 硫(磺)
strand[strænd] n. 股，绫，绞
tangle['tæŋgl] vt. 使缠结；n. 缠结，纷乱
smear[smiə] vt. 涂，敷，弄脏
malnutrition[mælnju:'triʃən] n. 营养不良
deficiency[di'fiʃənsi] n. 缺乏，不足
restrict[ris'trikt] vt. 限制，限定，约束
pigment['pigmənt] n. 颜料，色素
carrot['kærət] n. 胡萝卜
maize[meiz] n. 玉米
palm[pa:m] n. 棕榈
irradiate[i'reidieit] vt. 照射，照耀
calcium['kælsiəm] n. 钙
phosphate['fɔsfeit] n. 磷
iodine['aiədi:n] n. 碘
sodium['səudjəm] n. 钠
chloride['klɔ:raid] n. 氯化物
amino acid[ə,mi:nə'æsid] 氨基酸
by convention 按习惯
so far as 就……而言，至于

Specialized Terms

inorganic mineral components 无机矿物成分
organic substances 有机物质
compound molecules 复合分子
polymer structure of starches 淀粉聚合结构
gluten fiber of wheat 小麦的面筋纤维
fatty substances 脂肪类物质
soluble substances 可溶物质
simple sugars 单糖
structure of starch grains 淀粉颗粒结构
fish oils 鱼肝油
calcium compounds 含钙化合物

Notes

1. In addition, there is a group of inorganic mineral components and a group of organic substances present in comparatively small proportions. 此外，还有一些比例较小的无机矿物成分和有机物质。“present in comparatively small proportions”为一形容词短语，是主语“a group of inorganic mineral components and a group of organic substances”的后置定语。

2. Sugars are soluble substances of which the best known is the common sweet substance “sugar”, a compound molecule technically known as sucrose and composed of glucose and fructose. “of which”常和形容词或副词最高级一起用，表示“其中”。

e. g. Of the three students he is the tallest one. 三个学生之中他最高。

3. …the structure and conformation of the polymer chains of which they are composed differ in detail。… 组成这些淀粉的聚合链的结构和形态在细节上是不同的。“…of which they are composed”是定语从句。“conformation”是派生词，是由词根“conform”加后缀组成的。英语的词可以由词根＋前缀或后缀组成，前缀和后缀不能单独成词，但它们可以与词根构成派生词。

e. g. write—writer conduct—conductor tell—retell liberate—liberation

4. Fat that is liquid at the normal climatic temperature at which one happens to live is by convention called an oil,… in Alaska. 本句为复合句，主句为 "Fat is by convention called oil"，"that is …to live"为从句。

Exercises

Ⅰ. Tell whether the following statements are true or false according to the text.

1. The structure and conformation of the starches from diverse grains differ in detail.
2. Dextrins are compounds which are midway in molecular size between the one- or two-glucose length of simple sugars and the very large, polymer structure of starches.
3. The polymer chains of protein are made up with amid acids as links.
4. Fats and oils are different both in their physical properties and in their chemical composition.
5. Vitamin C is only stored in fruit and vegetables.

Ⅱ. Choose the best answer to complete the following sentences.

1. The vitamins in food are _____.
   A. inorganic mineral components
   B. organic substances
   C. carbohydrates
   D. muscular tissues
2. Carbohydrates contain _____.
   A. sugars
   B. sugars and starches
   C. all compounds of large molecules
   D. sugars, starches and dextrins
3. The moleculars of proteins are _____.
   A. less complex than those of starch grains
   B. less intricate than those of animal muscle
   C. more complex than starch grains
   D. even less intricate than gluten fibres of wheat
4. Fat are quite different from proteins _____.
   A. in their composition
   B. in their structures
   C. in their functions
   D. all above
5. Salt is present naturally _____.
   A. in some food
   B. in a lot of food
   C. in most food
   D. in food in big amounts

Ⅲ. Change the following words by adding suffixes or prefixes.

1. -er / -or

receive	_____	lend	_____
send	_____	speak	_____
call	_____	conduct	_____

2. -ly

angry _____ happy _____

foolish _____ sad _____

large _____ heavy _____

3. re- / in- / im-

call _____ form _____

correct _____ perfect _____

famous _____ polite _____

Ⅳ. Translate the following sentences into chinese.

1. Food is composed of three main groups of constituents: carbohydrates, fat and proteins.
2. Sugar are soluble in water and readily form syrups; starches are not, as a general rule, soluble at all.
3. The polymer chains of starch are made up of links, each of which is the same.
4. We recognize fat when we see it as a smooth, greasy substance.
5. Foods contain in small amounts a comparatively long list of mineral components.

Reading Material

Food Today

Next time you see a packet of frozen[1] food or a tin[2] of vegetables or soup, look at the label[3] to see if there are any added flavorings[4] or colorings[5] or preservatives[6]. It's very difficult to find any processed food these days that hasn't had something added to it.

Why do we have to eat processed food[7]? Why can't we all have fresh food every day? Quite simply, it's because there are too many people and too little fresh food.

Processed food is the end of a long chain that starts with increased food production based on modern methods using artificial fertilizers, insecticides, and chemical-balanced[8] animal feeding-stuffs.

Very large quantities of food are produced and they have to be available to the customer when he or she wants to buy them. So they have to be preserved by various processes, including deep-freezing[9], canning[10] and dehydrating[11]. Very often the process itself changes the color or taste of the food, but this is corrected by using additives[12].

Did you know that it is possible to change the color of the yolk[13] in an egg? If you put an additive (carophyll[14] orange) into the feed of battery[15] hens, it will make the yolk in the eggs they lay turn from a pale to a darker yellow.

Notes

1. frozen['frəuzn] a. 冰冻的
2. tin[tin] n. 罐头
3. label['leibl] n. 标签，标记，符号
4. flavoring ['fleivəriŋ] n. 调味品，调味香精
5. coloring['kʌləriŋ] n. 着色剂，色素，颜料
6. preservative[pri'zə:vətiv] n. 防腐剂
7. processed food 加工食品
8. chemical-balanced['kemikæli'bələnst] a.（含有定量）化学（品）配量的
9. deep-freeze[di'p'fri:z] vt. （以极低温度快速）冷冻
10. can[kæn] n. 罐头；vt. 把（食品）装罐
11. dehydrate[ˌdi:'haidreit] vt. 使脱水
12. additive['æditiv] n. 添加剂
13. yolk[jəuk] n. 蛋黄，卵黄
14. carophyll['kærəfil] a. 卡罗叶的
15. battery['bætəri] n. 孵蛋箱组

Questions

1. Is it difficult to find any processed food today that hasn't had something added to it? Why?
2. Why can't we all have fresh food every day?
3. How to change the color of the yolk in an egg?