

粮油食品 英语



胡鼎如 主编

河南人民出版社

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前 言

本书是根据国家教委 1985 年颁发的《大学英语教学大纲》有关专业阅读的规定编写的，内容包括：粮油加工工艺，粮油及其食品的储藏技术，以粮油为原料的各种食品制作技术及其营养价值，粮油食品机械、设备，以及饲料加工工艺等。本书有课文 60 篇。根据《大纲》关于专业阅读要保证较大的阅读量的要求，我们所选文章每篇均有 1500 个词左右，课文后附有单词、词组及简要注释；并设计有两种理解性练习，既可供课堂教学使用，也可供学生自学检查之用，最后附参考译文，以帮助自学者深入理解原文。本书全部文章均选自近几年出版的英文版粮油食品专业教材，科学论著，内容丰富，专业词汇复盖面广，既可作粮油食品类及农牧类各级专业学校的阅读教材，也可作为从事这方面研究的科技工作者的专业英语自修课本。

本书可供大学本科高年级使用，每周 2 学时，总学时 100 小时左右；不同专业可以有侧重地选择其中 45 篇文章，专业性较强的文章可以在四年级时使用。

路茜玉教授、朱天钦教授以及张根旺、过祥熬、姚文冠付教授对于本书译文进行了认真审校，在此谨向他们表示衷心感谢。由于编者水平有限，缺点和错误在所难免，诚恳希望读者指正。

编 者

1989 . 11

Contents

1. Relation of Nutrition to Food and Health 营养学与食品及健康的关系	1
2. The Main Components of Food 食品的主要成分	5
3. Carbohydrates 碳水化合物	9
4. Flour 面粉	14
5. Breadmaking 面包制作	19
6. Flour Milling (1) 制粉 (一)	24
7. Flour Milling (2) 制粉 (二)	28
8. Pretreatment of Oilseeds 油料的预处理	33
9. Extraction of Oils (1) 油脂制备 (一)	37
10. Extraction of Oils (2) 油脂制备 (二)	41
11. The History of Grain Storage 粮食储藏的历史	46
12. Maintaining Seed Viability and Quality 保持种子的生活力和品质	49
13. Low Cost Emergency Storage 低费用应急储藏	52
14. Rotary Pumps 旋转泵	57
15. Mixers 混合机	62
16. Koji 米曲	66
17. Chemical Composition of Beer 啤酒的化学成分	71
18. Spray Driers 喷雾干燥器	76
19. Feed Grinding 饲料粉碎	80
20. Rice Processing 稻谷加工	84
21. Moisture, No 1 for Safe Storage 水分——安全储存的第一要素	89
22. Modified Starches 变性淀粉	92
23. The Production of Vinegar 食用醋的酿造	96
24. Organisms used in Yeast SCP Production 用于酵母单细胞蛋白生产的微生物	101
25. Material Handling Equipment in Food Industry	

食品工业中的物料输送设备	106
26. Purification	
✓ 清粉	110
27. Refining (1)	
油脂精炼 (一)	115
28. Refining (2)	
油脂精炼 (二)	120
29. The Principle of Airtight Storage	
密封储藏原理	123
30. Milling Equipment	
✓ 粉碎设备	127
31. Wheat Cleaning Prior to Milling	
✓ 小麦入磨前的清理	132
32. Comditioning of Wheat	
✓ 小麦的水分调节	137
33. Chemical Composition of Starch	
淀粉的化学组成	142
34. Physical Properties of Oils and Fats	
油脂的物理性质	146
35. Modification of Oils	
油脂的改性	151
36. Presscs	
✓ 压榨机	154
37. Extractors	
浸出器	159
38. Pneumatic Coveying in the Sedreenroom	
麦间气力输送	163
39. Carbohydrate Change During Grain Storage	
粮食储藏过程中碳水化合物的变化	167
40. Protein Change During Storage	
粮食储藏过程中蛋白质的变化	171
41. Dry Milling of Cereals	
✓ 谷物的干磨	176
42. Plansifters	
✓ 平筛	180
43. Ready-to Eat Cereals	
方便粮食食品	185
44. Lipids	
类脂物	189
45. Protease from Moulds	
霉菌蛋白酶	193
46. Beer Treatment	
啤酒处理	198
47. Food Fermentated by Moulds Bacterin and Yeasts	
霉菌细菌酵母菌综合发酵食品	202
48. Amylolytic Enzymes from Bacteria	
细菌淀粉酶	207
49. Dough Fermentation in Breadmaking	
面包用发酵面团	212
50. Food Additives	
食品添加剂	217

51. Food Freezers	
食品冷冻机	221
52. Evaporators	
蒸发器	225
53. Indexes of Grain Deterioration (1)	
粮食的劣变指标 (一)	230
54. Indexes of Grain Teterioration (2)	
粮食的劣变指标 (二)	235
55. General Coments on Oil and Fats	
油脂综述	240
56. Magarines and Shortenings	
人造奶油与起酥油	244
57. Oxidation and Polymerization	
油脂的氧化和聚合	248
58. Extrusion Cooking of Feed	
饲料膨化	252
59. Pelleting of Feed	
饲料制粒	257
60. Premixing of Feed	
预混合饲料	262

Lesson One

Relation of Nutrition to Food and Health

Nutrition is the science that deals with the effects of food on the body, or the way the body uses food for optimal health. According to Mary Swartz Rose, outstanding nutritionist, "Nutrition deals with the scientific laws governing the requirements of human beings for maintenance, growth, activity, and reproduction." Another well-known nutritionist, E. Neige Todhunter, added to Rose's definition: "and deals with all that makes man a healthy, functioning, creative human being through a well chosen diet."

People who study nutrition are concerned about the food that a person eats to live, to grow, to reproduce, to keep healthy and well, and to have energy for work and play.

Nutrition is the science that has accumulated facts about the forty to forty-five nutrients that the body must have. A nutrient is defined as a substance that the body must have in adequate amounts to grow, reproduce, and maintain a normal healthy life. When a person eats foods that contain these nutrients, the body uses them to manufacture many other substances essential for the body to function. Knowledge about the nutrients and why they are needed by the body will help promote understanding of the relationship of food to the body. Then, one appreciates why certain nutrients are important during the time a child or adolescent is growing, during pregnancy, during illness, and throughout life.

The nutritive value of food will be discussed frequently in this book. This refers to the nutrients found in a specific food and the quality and quantity of nutrients.

Knowledge and understanding of nutrition will help people to know better how their bodies function and what foods should be eaten to achieve optimal health. The many people involved in nutrition care are physicians, dietitians, nutritionists, nurses, dietetic technicians and assistant, social workers, teachers, public health workers, and homemaker—home healthy aides.

Their functions vary. For example, the physician prescribes a therapeutic diet for a patient with heart disease. The dietitian or nutritionist plans the daily diet with the patient so that the quantity and the quality of food conforms to the diet prescription. The dietetic technician assists the dietitian in providing the nutritional care services. The technician might obtain information about the patient's food habits, life style, and attitudes toward food that would be useful in planning nutritional care.

Health care means to provide for the needs of the patient, but it also means to care about what becomes of another human being. Health team members involved in nutrition care must apply nutrition knowledge to real-life situations. Application of nutrition knowledge is more of an art than a science. It requires understanding not only nutrition facts and principles, but human behavior. One needs to appreciate why people eat what they do, how to assist others to modify their behavior and eating patterns, how to communicate effectively with people, and how to evaluate what difference the nutrition knowledge makes.

Nutrition is not an exact or precise science. Many facts have been accumulated but much remains to be learned. Human beings are alike in many ways, but they are also different. Nutrition must take into account the likenesses as well as the differences. Because nutrition is not an exact or precise science with absolute answers, this makes the work of a health care professional more difficult in nutrition education and nutrition care.

The human body is a marvelous machine. It takes food with all its nutrients and uses the nutrients to manufacture substances that the body must have to perform its daily tasks.

The body draws on the available nutrients from the food for normal organ development and functioning; for normal reproduction, growth, and maintenance; for optimum activity level and working efficiency; for resistance to infection and disease; and for the ability to re-

pair bodily damage or injury. This is why nutrients are necessary, for the human being to move about, to speak, to taste, to feel, to laugh, to enjoy life, and to be a creative person.

In summary, the body requires nutrients to operate at optimal health and performance levels. The body must have these nutrients to take care of the body's daily functions—growth, maintenance, repair, and reproduction. Except for water and oxygen taken from air, the nutrient needs of your body can be met through food. The body requires some forty to forty-five substances or nutrients regularly. The nutrients can be grouped under carbohydrates, fats, proteins, vitamins, and minerals. People are alike in their need for these nutrients. The quantity or amount needed may vary, but all the nutrients are required throughout the life cycle.

What should be consumed to get the nutrients the body needs? As stated earlier, food is made up of the nutrients essential to the body. Knowledge about the nutritive value of foods will help one choose the proper foods and plan a daily diet that is adequate or balanced. A diet is simply defined as the food and drink regularly consumed.

All the food and drink that are taken into the body each day make up the diet. An adequate diet is food and drink that is sufficient to meet nutritional requirements. A balanced diet is another term referred to frequently. Balanced diet is used interchangeably with adequate diet. A balanced diet provides the essential nutrients in sufficient amounts.

The nutrient density of foods is another term one should understand. The nutrient density of foods refers to the concentration of important nutrients in a food (vitamins, minerals, protein) in relation to the caloric value of that food. Milk and meat have high nutrient density because they offer a good supply and variety of quality nutrients for each calorie they provide. Fat has low nutrient density because few nutrients are provided for each calorie.

Diet has become a word closely associated with "dieting to lose weight" or "a list of foods that one can't have." There are diets to help a person lose weight or manage a health problem. But the normal daily diet differs from such therapeutic diets. The normal daily diet is the food and drink consumed each day. Therapeutic diets are modifications of the normal diet to assist in the management of a health problem.

Many kinds and combinations of food can lead to an adequate or balanced diet. Despite what is stated often in advertising, a "perfect" food does not exist. No food, by itself, has all the nutrients needed for optimal growth and good health. Each nutrient has specific uses in the body. However, most nutrients do their best work in the body in combination with other nutrients. This is why a balanced diet is achieved through selection of a wide variety of foods consumed at regular meals.

The first step is to know the nutrients that the body requires. Then, it is necessary to choose the foods that will provide these nutrients. The next important step is to consume the food and drink. The body will not benefit from the nutrients in the food if it is not eaten.

The nutritional needs of people vary during the life cycle from infancy to old age. All persons, throughout life, have need for the same nutrients but in different amounts. The amounts of nutrients needed are influenced by a number of factors, such as age, sex, activity, and state of health. The body is the product of its nutrition at any given point in the life cycle.

This is why the study of nutrition helps one to identify what people have in common as well as how they differ. It is important to understand what people eat and why.

Nutrients are influenced by the way food is handled. The amount of nutrients in food, its safety, quality, appearance, taste, acceptability, and cost are all affected by the way food is handled. Handling means everything that happens to food while it is being grown, processed, stored, and prepared for eating.

New Words and Phrases

nutrition / nju(:)'triʃən / n. 营养

nutritionist / nu(:)'triʃənɪst / n. 营养学家

govern /'gavən/ vt. 支配, 控制
 maintenance /'meɪtɪnəns/ n. 保养, 维持
 生命
 function /'fʌŋkʃən/ vi. 活动 n. 功能
 nutrient /'njuːtriənt/ n. 营养素
 appreciate /ə'priːʃieɪt/ vt. 懂得
 adolescent /ædəʊ'lesnt/ a. 青春期的
 pregnancy /'pregnənsi/ n. 怀孕
 dietitian /daɪə'tiʃən/ n. 饮食学家
 aide /eid/ n. 助手
 therapeutic /θerə'pjʊːtɪk/ a. 治疗的
 conform /kən'fɔːm/ vi. 符合, 与...一致
 prescription /prɪsk'rɪpʃən/ n. 处方
 evaluate /i'veɪljueɪt/ vt. 评价

absolute /'æbsəljʊːt/ a. 绝对的
 infection /ɪn'fekʃən/ n. 感染
 consume /kən'sjuːm/ vt. 消费
 interchangeably /ɪntə'tʃeɪdʒiəbli/
 ad. 可交替地, 互换地
 density /'densɪti/ n. 密度
 vitamin /'vɪtəmin/ n. 维生素
 protein /'prəutiːn/ n. 蛋白质
 modification /mɒdɪfɪ'keɪʃən/ n. 缓和,
 修改
 infancy /'ɪnfənsi/ n. 婴儿期
 diet /daɪət/ n. 饮食
 deal with 论述, 涉及
 take into account 考虑, 重视

Notes

1. "Then, one appreciates during the time a child or adolescent is growing during pregnancy life"句中的"a child or adolescent is growing"为一定语从句, 修饰前面的the time, 句首省略了关系付词when, 全句的意思为"于是, 人们懂得为什么某些营养素在儿童或青少年发育时期, 在妇女孕期, 在人们生病的时候以及整个一生中是很重要的原因。"

2. "Health care means to provide for the needs of the patients but it another human being."全句的意思为"保健不仅意味着供给病人的需求, 同时也意味着关心健康人的情况。"其中"What becomes of sb. / sth"为一习语, 意思是"某人或某物的情况怎样", another human being 意思为"另外的人", 此处指"健康人".

3. "This is why nutrients are necessary"句中的"for the human being to move about"乃一动词不定式复合结构, 其中的"the human being"是动词不定式的逻辑主语, 全句的意思为"因此, 人的活动, 说话, 吃东西.....都需要营养."

4. "except for"和"except"都可译成中文"除去....."的意思, 若其后的名词所表示的人和事物与句中所述的人和事物是同类时, 可以互换.

e.g. Except (for) him, we all went to the cinema.

若其后的名词所表示的人和事物与句中所述的人和事物不同类时, 只能用 except for .

e.g. The room was deserted except for a little girl.

Exercises

I. Are the following statements true or false according to the text?

1. Nutrition is the science that deals with all that makes man a healthy, functioning, creative human being through a well chosen diet.
2. Nutrient is a thing helpful for health.
3. Nutritive value of food refers to the nutrients found in specific food and the quality and quantity of nutrients.
4. Therapeutic diets are balanced diets consumed each day.
5. All persons have the same need for all nutrients.

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

1. Nutritionists are people _____.
 a. concerned about food b. who prescribe a therapeutic diet for patients
 c. who are concerned about the food of patients only
 d. who are involved in nutrition care of human beings
2. "Application of nutrition knowledge is more of an art than a science." means that _____.
 a. "Application of nutrition knowledge" is a problem of a science, but not a problem of an art
 b. "Application of nutrition knowledge" is a more important art problem than a science problem

- c. "Application of nutrition knowledge" is needing more skill of drawing than knowledge of science
 d. "Application of nutrition knowledge" is a problem of an art in a greater extence, but not a problem of an art
3. The body draws on nutrients _____.
 a. from the food only b. from the air c. from water d. from all above
4. The nutrient density of foods depends on _____.
 a. the amount of important nutrients in food
 b. the variety and quality of important nutrients in food
 c. the amount of calories the foods provide
 d. the concentration of important nutrients in a food in relation to caloric of that food
5. A balanced diet _____.
 a. has the same amount of all nutrients
 b. has all the nutrients needed for the body in the same amount
 c. has the most important nutrients
 d. is achieved through selection of a wide variety of foods consumed at regular meals

参考译文

营养学与食品及健康的关系

营养学是研究食品对身体的作用或者身体如何使用食品达到最佳健康状况的科学，按照卓越的营养学家玛丽·斯沃特·罗斯的说法：“营养学研究支配人类生存，生长，活动及繁殖的科学规律”。另一位有名的营养学家伊·尼古·托德亨德对罗斯的定义加以如下的补充：“营养学还研究通过适当地选择饮食而使人们保持身体健康，并具有活动能力和创造力的一切事物。”

研究营养学的人们所关心的是：人为了生存、生长、繁殖、维持健康以及获得工作和娱乐所需能量而食用的食品。

营养学是一门科学，现已集聚了 40 到 50 种关于人体必须的营养素的资料。营养素乃是身体必须具备的满足生长繁殖以及维持正常健康生活的物质。当一个人吃了含有这些营养素的食品，身体即利用这些营养素制造很多其功能发挥所必需的其它的物质。了解营养素，弄清楚为什么身体需要这些营养素，这会帮助人们明白食品与身体的关系，从而懂得为什么某些营养素在儿童或青少年生长发育期，妇女怀孕期，人们患病期以及一生中是重要的道理。食品的营养价值本书将经常予以讨论，所谓营养价值即指某一食品中所含的营养素以及营养素的质量和数量。

对营养学的认识和了解将会帮助人们更好地知道自己身体器官是如何完成其功能的，以及为了达到最佳健康状况应该吃些什么食品。有很多人参与营养保健工作有关，他们是内科医生，饮食学家，营养学家，护士，饮食技术员，饮食学助理员，社会福利事业工作者，教师，公共卫生工作者和家庭保健助理人员。

他们的职责是不同的，譬如内科医生建议心脏病病人用饮食疗法，饮食学家或营养学家为病人计划每日的饮食，以便其数量和质量符合饮食疗法的要求。饮食技术员协助饮食学家提供营养保健服务，技术员应该查明病人的下列情况：即他们的饮食习惯，生活方式和对待有益于营养保健的食品的态度。

保健不仅意味着提供病人的需求，也意味着关心健康人的情况。从事营养保健工作的卫生人员必须将其营养学方面的知识应用到实际生活环境中，营养学知识的应用与其说是门科学，不如说是门艺术。它要求我们不仅懂得营养学的知识和原理，而且了解人的举止行为。一个营养学家需要弄清楚人们为什么吃他们要吃的东西，如何帮助他们改进饮食习惯和饮食模式，还要告知如何有效地和人们交往，如何评估营养学知识产生的影响。

营养学不是一门精确的科学，现在已经集聚了很多事实资料，但很多问题尚待弄清，人在很多方面是相同的，但也是有区别的。营养学必须考虑到相同之处，也应注意其区别。因为营养学不是精确的科学，不能提供绝对的答案，这就使得保健工作在营养学教育和营养保健上的专业化更为困难。人体是一台奇异的机器。它接受食品及所含的一切营养素，使用营养素来制造其为了完成日常任务而必须的物质。

身体从食品中吸收能够利用的营养素以维持其器官的发展及活动，正常的繁殖、生长和运转，达到最佳活动水平和工作效率，抵抗感染和疾病，获得修复身体损伤的能力。因此营养素对于一个人能够四处活动，说话，吃东西，感觉，笑，享受生活的乐趣，以及成为一个创造性的人都是非常必要的。

总之，身体需要营养素，以便在最佳的健康状态和最有效率的水平上进行活动。身体须要这些营养素以维持其日常功能：生长、运转、修复和繁殖，除了水和取自空气的氧气以外，我们身体对营养素的需

能通过食物来满足, 身体通常需要大约 40 至 45 种物质或营养素。营养素可以归纳为碳水化合物, 脂肪, 蛋白, 维生素和矿物质几类, 人们对这些营养素的需要是相同的, 所有的营养素在人的一生中的所有阶段都是需要的, 但需要量各异。

应该消费什么东西来获得身体所需要的营养素呢? 正如前面所述的那样, 食品是由身体所必须的营养素组成。关于食物营养价值知识会帮助人们选择适当的食品, 计划合适的, 或者说平衡的日常饮食。饮食的定义简单来说就是日常消费的食物和饮料。

每天摄入体内的所有食品和饮料组成了饮食, 适当的饮食就是足以满足身体营养需要的食品和饮料, 平衡的饮食是另一个经常提到的术语, 平衡饮食常和适当的饮食交换使用, 平衡饮食供给足够数量的必要营养素。

食品的营养浓度是人们应该懂得的另外一个术语。食品的营养浓度指的是食品中重要营养素(维生素、矿物质和蛋白质)相对于食品热值的浓度。牛奶和肉具有很高的营养浓度, 因为这些食品提供的每卡热值具有充分的和各种高质量的营养素; 脂肪具有较低的营养浓度, 因为每卡热值提供很少营养素。规定的饮食已经成为一个与《减肥节食》或者《人们不宜食用的食谱》有紧密关系的词, 有一些帮助人们减肥和治疗某种病症的特种饮食。但正常的日常饮食不同于食物疗法的饮食, 正常的饮食是人们每天消费的食品和饮料; 食物疗法的饮食是对正常饮食的改进以帮助治疗某种病症。多种食品组合能够达到合适的或者平衡的饮食。尽管广告经常宣传完美的食品, 但实际并不存在完美的食品, 没有一种食品单独具有使身体得到良好发育, 处于良好健康状态所需要的所有营养素。每种营养素在身体中都具有其特有用途, 但是绝大多数营养素都是和其它营养素结合在一起才会发挥最佳效果, 因此一日三餐正常膳食要通过选择各种各样食品以达到平衡饮食。

第一步是要知道身体所需要的营养素是什么, 然后必须选择能够提供这些营养素的食物; 下一步就是消费这种食物和饮料, 如人们不吃食物就不能从这种食物所包含的营养素那里得到好处。

人们从孩提时代到老年的一生中不同时期的营养要求是不一样的。所有的人在一生中都需要某些营养素, 但其数量不一样, 人们所需营养素的数量受到一系列因素的影响, 如年龄、性别、活动和健康状况, 身体是一生中某特定点的营养的产物。

因此, 研究营养学能帮助人们判定人们有那些共同的东西, 有什么不同的东西, 重要的是要了解人们吃的是什么, 以及为什么吃这些食物。

Lesson Two

The Main Components of Foods

Food is composed of three main groups of constituents: carbohydrates, fats and proteins. In addition, there is a group of inorganic mineral components and a group of organic substances present in comparatively small proportions: these are the vitamins.

(a) CARBOHYDRATES

To this class of compounds the sugars belong. 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. 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 larger 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. 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 dextrins. 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 dextrins. The gum on postage stamps is usually dextrin.

(b) 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 or even than the gluten fibres 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 very 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 fibres tangled across from one to another.

(c) FATS

The food technologist can usually recognize fats 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 fibres of meat or even the gluten strands in bread, two examples of protein that have already been mentioned, fats 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 bread 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 fats which differ primarily from each other in the temperature at which they melt. A fat that is liquid at the normal climatic temperature at which one happens to live is by convention called an oil, but the chemical compositions of fats and oils are similar and the same fat in Europe may be an oil in Africa just as an oil in Europe may be a fat in Alaska.

(d) 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:

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

(ii) 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 found in milk, fish oils and in some other fatty substances that have been irradiated either by sunlight or artificially.

(e) MINERAL COMPONENTS OF FOOD

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

(i) 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.

(ii) 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.

(iii) 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.

(vi) 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 cheese-making.

New Words and Phrases

constituent / kən'stitjuənt / n. 成分, 要素
carbohydrate / 'kɑ:bou'haidreit / n. 碳水化合物, 糖类

inorganic / inɔ:'gænik / a. 无机的
soluble / 'sɒljubl / a. 可溶的

sucrose / 'sju:krouz / n. 蔗糖
glucose / 'glu:kous / n. 葡萄糖
fructose / 'fraktous / n. 果糖, 左旋糖
maltose / 'mɔ:ltous / n. 麦芽糖

germinate / 'dʒə:mineɪt / vt. 使发芽
lactose / 'læktous / n. 乳糖

starch / stɑ:tʃ / n. 淀粉
diverse / dai'vɜ:s / a. 多种多样的, 多变化的

conformation / kən'fɔ:'meɪʃən / n. 符合, 形态
polymer / 'pɒlimə / n. 聚合物

tuber / 'tju:bə / n. 块茎, 结节

glycogen / 'glikoudʒən / n. 糖原, 动物淀粉

liver / 'lɪvə / n. 肝脏

oyster / 'ɔɪstə / n. 牡蛎, 蚝

exertion / ɪg'zɜ:ʃən / n. 费力, 劳顿

syrup / 'sɪrəp / n. 糖浆, 果汁

dextrin / 'dekstrɪn / n. 糊精

malt / mɔ:lt / n. 麦芽

toast / təʊst / n.v. 烤面包, 烘烤

intricate / 'ɪntrɪkɪt / a. 复杂的

gluten / 'glu:tən / n. 谷朊, 面筋, 麸质

casein / 'keɪsi:n / n. 酪蛋白

gelatinous / dʒɪ'lətɪnəs / a. 含凝胶的, 胶冻状的

contractile / kən'træktail / a. 可收缩的

destructible / dis'træktəbl / a. 可破坏的, 可消灭的

cellulose / 'seljələʊs / n. 纤维素

nitrogen / 'naɪtrɪdʒən / n. 氮

sulphur / 'sʌlfə / n. 硫

strand / strænd / n. 股, 缕, 绞

tangle / 'tæŋɡl / n. 缠结, 纷乱

smear / smɪə / vt. 涂, 敷, 弄脏

malnutrition / mæl'nju:'triʃən / n. 营养不良

deficiency / di'fɪʃənsi / n. 缺乏, 缺少

restrict / rɪ'strɪkt / vt. 限定, 约束

pigment / 'pɪgmənt / n. 颜料, 色素

carrot / 'kærət / n. 胡萝卜

maize / meɪz / n. 玉米

palm / pɔ:m / n. 棕榈

irradiate / i'reɪdɪeɪt / vt. 照射, 照耀

calcium / 'kælsɪəm / n. 钙

phosphate / 'fɒsfet / n. 磷

iodine / 'aɪədi:n / n. 碘

sodium / 'səʊdɪəm / n. 钠

chloride / 'klɔ:raɪd / n. 氯化物

amino acid 氨基酸

by convention 按习惯

so far as 就……而言, 至于

Notes

1. In addition, there is a group of inorganic mineral components and a group of organic substances present in comparatively small proportions. “presen in comparatively small proprtions”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”常和形容词或付词最高级一起用,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. A 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“A fat is by convention called an oil.” “that isto live”为从句。

Exercises

I. Are the following statements 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 molecules 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. Fats 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

参考译文:

食品的主要成分

食品主要由三种成分组成:碳水化合物,脂肪和蛋白质。此外还有一类无机矿物成分及一组份量比较小的有机物质,即各种维生素。

一、碳水化合物:糖属于这类化合物,糖是可溶物质,其中大家熟知的是普通食糖,在技术上叫蔗糖的一种化合物,它由葡萄糖和果糖组成。当谷物发酵时形成一种由两个葡萄糖分子组成的化合物—麦芽糖;另外一种化合物—乳糖产生于牛奶中;各种淀粉也是碳水化合物。正如前面提到的,淀粉具有大得多的复合分子,它是植物在种子和其它器官中为自己储存食品的一种形式,虽然来自各种谷物的淀粉和来自马铃薯的淀粉基本是相同的,但是组成这些淀粉的聚合链的结构和形态在细节上是不同的。对这些淀粉进行加工时,它们的区别就变得明显起来。

淀粉是谷物的主要成分,也是根及块茎的主要成分,还有另外一种产生于动物体内的淀粉,叫动物淀粉。像种子中的淀粉一样,动物淀粉在动物体内起着储存燃料的作用,肝脏含有比较多的动物淀粉,马肉及牡蛎肉也有较多的淀粉。

糖能溶于水,而且容易形成糖浆,淀粉通常情况下完全不溶于水,然而有一中间性化合物,其分子大小介于单糖的一、二个葡萄糖分子长度与非常大的淀粉聚合结构之间,这种化合物叫糊精,产生于自然

界，譬如在麦芽中。但是只有在食品加工时产生的这种化合物才得到更普遍的承认，如当面包烤熟时，其表皮上生成的焦黄物质就是糊精，邮票上的胶浆通常也是糊精。

二、蛋白质：碳水化合物基本上是一种燃料，首先作为它在其中生成的植物的燃料，然后又作动物和人的燃料。虽然淀粉颗粒的结构比糖类的那种比较简单的化学分子要复杂，但是比动物肌肉的弹性物质，或者比小麦的面筋纤维，乳酪的类似橡胶的酪蛋白，即蛋白的胶冻状物质要简单得多，后面提到的这些物质都是蛋白质。

可以把肉看作是一个例子，它主要是肌肉组织，坚固，可收缩，但如果处置不当，也可破坏，像现在已经研制出的人造塑料一样，肌肉也是聚合物，而且比淀粉或纤维素要复杂得多。

淀粉的聚合链由相同的链环组成的。我在上面已经说过淀粉的每个链(环)都是一个葡萄糖单位，然而具有更加多样结构的蛋白质是由二十多种不同物质的各种各样的集合体组成的聚合链，这些叫做氨基酸的物质起着链环的作用。它们虽然各不相同，但在总的结构上是相似的，都具有一个共同的特点，即含有一个或更多的氮原子。组成蛋白质分子的氨基酸链中的各个链环通过氮原子联结起来，有些氨基酸还含有一个硫原子，这使蛋白质链互相附贴在一起，很像搓成的绳子各股线之间还有横穿纤维将其缠绕在一起。对蛋白质组成的这样简单的描述已经足以看出其化学结构是非常复杂的。

三、脂肪：食品技术员见到脂肪时通常即能加以识别，因为它与其它两个食品的主要成分之间不论在物理特性上，还是在化学组成上都有显著的不同。与组成碳水化合物的主要部分——淀粉颗粒不同，更不同于肌肉纤维及面包中面筋条这两种前面提及的蛋白质，脂肪根本没有结构形式。确实，脂肪主要是燃料，不论对动物，还是对脂肪原先生成于其中的植物以及吃含有脂肪的食物的人来说都是这样。一片面包具有明显的，特有的结构，而抹在上面的黄油则没有。

我们看到一种滑腻的物质时，即会认出它是油脂。有很多种不同的油脂，其主要的区别就在于其溶化温度不同，在人们生活的通常温度下呈液态的脂肪习惯上叫油，但是脂肪和油的化学成分是相似的，而且在欧洲叫脂的同样物质在非洲可能是油，就像在欧洲的油可能在阿拉斯加是脂一样。

四、维生素：在大多数的食品中都有一些有机物质，就其对食品的外观品质影响来说，似乎不会引起食品技术人员的直接关注。然而这些物质对于作为整个饮食的营养价值来说却是极其重要的。虽然这些物质可能在食品中只有百万分之几，但是饮食中如果缺少这些物质就会引起营养不良，营养缺乏，以致最终引起死亡。

维生素可以简分为两组：

1) 可溶于水的维生素，比较明显的是广泛存在于谷物制品、肉、奶、马铃薯及蔬菜中的B族维生素和相当程度上只局限于在水果及蔬菜中的维生素C。

2) 可溶于油脂中的维生素，包括存在于鱼、蛋和奶中的维生素A，可以在胡萝卜、黄玉米、绿色蔬菜、棕榈油、红薯以及其它一些食品中找到的具有维生素A的作用的黄色素，以及在牛奶、鱼肝油和其它一些经过太阳光和人工光照的脂肪类物质中找到维生素D。

五、食品的矿物成分：食品含有少量的但种类相当多的矿物成分，其中有：

1) 含钙化合物：磷酸钙是骨骼的一个成分，也存在于奶中，奶中的钙集中在奶酪和干奶中，鱼可能也是磷酸钙的一个重要来源。

2) 碘：这种元素对身体健康相当重要，也存在于海鱼中，现有的碘的绝对数量是极少的，但是良好饮食中要求的数量也是很少的。

3) 铁：是食物中更加需要的一种矿物质，存在于肉中，并以很容易吸收的形式存在于肝中，蔬菜也供给相当数量的铁。

4) 盐：大量存在于各种食品中的矿物质是食盐，其化学术语为氯化钠。虽然盐天然地存在于一些食品中，但是大多数是后来加上的，如烧煮食品及食品加工，面包及奶酪制作时都要加盐。

Lesson Three

Carbohydrates

Carbohydrates have until relatively recently been the principal source of human energy. Carbohydrate consumption is currently about 75 percent of the intake of sixty years ago. Of the two basic carbohydrate energy providers, starch and sugar, starch was the main energy

source.

Since World War II, Americans have consumed fewer carbohydrates. The current diet is made up of approximately 46 percent carbohydrates. Some nutritionists believe that this trend should be reversed, and that people should increase their carbohydrate consumption through use of fruits, vegetables, and whole grains. Some authorities recommend that the American diet should contain 55 to 60 percent carbohydrates.

In this country, before the development of the modern food processing and distributing industry, the kind and amount of carbohydrates in the diet was largely governed by what was available locally.

The Pilgrims survived that first year in Massachusetts because the Indians had enough cornmeal for a two-pound allowance for each person for the winter ahead. Early settlers in the Carolinas found that the land was well adapted to the cultivation of rice, which became a staple in the diet of colonists in that area¹.

The proportional intake of carbohydrate is high in developing countries of the world because these foods are the most economical to produce. Recent data show that 750 million inhabitants of the "developing" countries eat about 75 percent of their daily calories as starch foods. These are unrefined or lightly refined fiber-rich foods. On the other hand, 500 million inhabitants of the "developed" countries eat about 30 percent of their daily energy as starch foods. These are usually refined white flour or white rice.

In tropical countries, where vegetation is luxurious and the climate leads to rapid spoilage of meat products, carbohydrates are a much more available and practical food. In the Far North, where grains will not grow, people have always lived on a diet chiefly of meat and fish.

Carbohydrates are compounds that contain carbon, hydrogen, and oxygen. The hydrogen and oxygen occur in the same proportion as in water. Most carbohydrates are of plant origin. The significant exceptions are glycogen, the animal equivalent of starch; lactose, an animal milk sugar; and ribose, a sugar associated with animal nucleic acids. Carbohydrates are commonly used by animals and human beings for food. They are synthesized in nature by green plants through a complex process called "photosynthesis." Plants combine the carbon dioxide of the atmosphere with water in the presence of sunlight. The carbohydrate product is then stored in the plant parts such as root, seed, fruit, stem, or leaf.

This photosynthesis process is central to life because carbohydrates from plants are the major energy fuel that enables animals to survive.

Three groups of carbohydrates are of major importance:

1. Monosaccharides: Simple sugars, which cannot be broken down into smaller units during digestion, such as glucose.
2. Disaccharides: More complex sugars, which can be split into monosaccharides or simple sugars during digestion, such as sucrose.
3. Polysaccharides: Larger, more complex molecules, which may also be split into monosaccharides or simple sugars during digestion, such as starch.

Also each of these three groups of carbohydrates contains certain important carbohydrates most commonly referred to in nutrition:

1. Three monosaccharides: glucose, fructose, and galactose.
2. Three disaccharides: sucrose (cane or beet sugar), lactose (milk sugar), and maltose.
3. Four polysaccharides: starch, dextrans, cellulose, and glycogen.

These groups of carbohydrates are important in nutrition because the disaccharides and polysaccharides must be broken down into monosaccharides before they can be used by the body.

Monosaccharides The monosaccharide is often called "simple" sugar. Glucose is a monosaccharide and a moderately sweet sugar. It is found naturally in foods or is formed by the body during digestion. All other types of sugar and starch are changed by the body into