



## حقيبة تعليمية

بعنوان: التغذية والتغذية العلاجية

## إعداد

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دكتوراه في الكيمياء الحياتية

2023 - 2022



## المقدمة

Studying the course of nutrition makes the students understand the fundamental principles of human nutrition with application of physiological needs of individual, food sources and selection of an adequate diet and nutrition surveillance. Beside knowing the scientific principles of human nutrition chemistry and physiology of protein, carbohydrate, Lipid, vitamins and minerals and their ingestion, digestion, absorption transport and metabolism. Selection some health cases and problems in the area of nutrition such as diet in pregnancy and lactation, weight control, diet and diabetes mellitus, cardiovascular diseases .....etc to be studied.



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### وصف المقرر الدراسي

يوفر وصف المقرر هذا إيجازاً مقتضياً لأهم خصائص المقرر ومخرجات التعلم المتوقعة من الطالب تحقيقها مبرهنأ عما إذا كان قد حقق الاستفادة القصوى من فرص التعلم المتاحة. ولا بد من الربط بينها وبين وصف البرنامج؛

1. المؤسسة التعليمية	كلية الرشيد الجامعة
2. القسم العلمي / المركز	قسم التمريض
3. اسم / رمز المقرر	التغذية والتغذية العلاجية 305 / المرحلة الثالثة
4. أشكال الحضور المتاحة	محاضرات حضوريه
5. الفصل / السنة	الفصل الدراسي الاول / 2022-2023
6. عدد الساعات الدراسية (الكلي)	2 ساعة اسبوعيا
7. تاريخ إعداد هذا الوصف	2022/9/17
8. أهداف المقرر	



يهدف تدريس موضوع التغذية والتغذية العلاجية للمرحلة الثالثة / الفصل الاول الى تقديم وعرض اهم الاسس اللازمه لفهم التغذية وعلاقتها باعضاء و وظائف الجسم وامراضه المختلفه وعلقتها بصحة الفرد بشكل عام والتغذية المخصصه واللازمه لبعض الحالات المرضيه كي يستفيد منها الطالب ويطبقها خلال حياته العمليه.

9- مخرجات المقرر وطرائق التعليم والتعلم والتقييم

Ministry of education and scientific research

وزارة التعليم العالي والبحث العلمي

كلية الرشيد الأ- الأهداف المعرفية

- 1- التعرف على المكونات الغذائية المختلفة واهميتها لصحة الفرد واستمرار حياته بشكل طبيعي .
- 2- دراسة دراسة هذه العناصر الغذائية.
- 3- دراسة التغذية العلاجية المرتبطة ببعض الحالات الفسلجية والمرضية كالحمل والرضاعه وداء السكري وامراض القلب.

ب - الأهداف المهاراتية الخاصة بالمقرر.

- 1- تعليم الطالب على الاستفادة من وحدة الانترنت لاستخراج البحوث والتقارير الملخصة حول المادة العملية المقررة.
- 2- المناقشة المستمرة داخل المحاضرة وطرح بعض الاسئلة الخارجية لتوسيع مدى فهم الطالب للمادة ومشاركة الطالب المستمرة في الوقوف امام السبورة في كتابة المواد الغذائية وفوائدها للجسم .
- 3- اعداد التقارير العلمية المختلفة المتعلقة بالموضوع.
- 4- اداء الواجبات البيتية المتعلقة بالمواضيع المأخوذة لاختبار مدى فهم الطالب للمادة.

طرائق التعليم والتعلم

استخدام السبورة والمحاضرات ورقية والكترونية PDF و point power والتسجيل الفيديوي للمحاضرة والكوكل ميت لمناقشة المادة المشروحة في المحاضرة.

طرائق التقييم

- اختبارات تحريرية
- 2 اختبارات شفوية وطرح الاسئلة خلال المحاضرة
- 3 الواجب البيتي
4. التقارير والبحوث

ج- الأهداف الوجدانية والقيمية

- 1- اعطاء الطلبة عدد من الاسئلة الخارجية كواجب بيتي واعطاءهم فرصة للتفكير وايجاد الحلول العلمية الصحيحة لتوسيع مداركهم
- 2- تحفيز الطلبة على اجراء التقارير والبحوث في ما يخص المواد التي يدرسونها واستخدام التقنيات الحديثة في البحث وتطوير مهارات البحث لديهم كالانترنت واستخدامها بالشكل الصحيح في ايجاد ما يطلب منهم من واجبات.

طرائق التعليم والتعلم

طرائق التقييم

- د - المهارات العامة والتأهيلية المنقولة ( المهارات الأخرى المتعلقة بفاعلية التوظيف والتطور الشخصي ).
- 1- تطوير مهارة الطالب في الاستنتاج وربط الجانب النظري مع التجارب الواقعية في الحياة اليومية.
- د 2- القدرة على التعبير عن الافكار بوضوح وثقة في الكلام
- د 3- العمل الجماعي

كلية الرشيد الج د



The course of nutrition includes:

- 1 - fundamental principles of human nutrition with application of physiological needs of individual, food sources and selection of an adequate diet and nutrition surveillance.
- 2 - scientific principles of human nutrition chemistry and physiology of protein, carbohydrate, Lipid, vitamins and minerals and their ingestion, digestion, absorption transport and metabolism.
- 3 - The role of vitamins and minerals in living system and the exploration of their multitude of function, chemical properties of them and how that relate to the function in cells and tissues, consequences of deficiencies based on knowing functions.
- 4 – selected health cases and problems in the area of nutrition such as diet in pregnancy and lactation, weight control, diet and diabetes mellitus, cardiovascular diseases .....etc.

## Course objectives

This course is designed to introduce the nursing student to clinical dietary and nutritional principles and their role for proper growth and development as well as maintenance of health. Through the process of understanding and application the students learn how these factors influence a patient overall health status across the lifespan.



## References

Text Book	
<b>Title</b>	Basic nutrition and diet therapy
<b>Author(s)</b>	Staci , Nix , William's
<b>Publisher</b>	Elsever Mosby
<b>Year</b>	2016
<b>Edition</b>	15 <sup>th</sup> ed

Reference	
<b>Title</b>	Nutritional foundation and clinical applications , a nursing approach
<b>Author(s)</b>	Michele , G. , Sylvia , E .S. and Suzanne, D.
<b>Publisher</b>	Elsever Mosby
<b>Year</b>	2016
<b>Edition</b>	6 <sup>th</sup> ed.





<b>Title</b>	Human nutrition
<b>Author(s)</b>	Marie , K .R. ,Alan , C. , Allison , C. , Cheryl , G and William , M .
<b>Publisher</b>	Elsever Mosby
<b>Year</b>	2018
<b>Edition</b>	PDF on line

Reference	
<b>Title</b>	Advanced nutrition and human metabolism
<b>Author(s)</b>	Sareen , S . gropper , J . S
<b>Publisher</b>	Elsever Mosby
<b>Year</b>	2018
<b>Edition</b>	7 <sup>th</sup> ed.



## Part 1

Intruduction to nutrion

- 1.1 The digestive system and metabolism.
- 1.2 Pysiologic value of food.
- 1.3 Nutrition classiffication.
- 1.4 food guide pyramid.

## Part 11

Planing for healthy diet

- 2.1 recommended ditary allownce.
- 2.2 recommended energy nutrient intake.
- 2.3 Food exchange
- 2.4 nutrional labeling.
- 2.5 nutritional density.
- 2.6 basal metabolic rate.
- 2.7 factors affect B.M.R

## Part 111

- 3.1 Carbohydrate.
- 3.2 Classification of carbohydrate.
- 3.3 Simple carbohydrate.
- 3.4 Complex carbohydrate.
- 3.5 function of carbohydrate.
- 3.6 Sorces of carbohydrate.
- 3.7 Common diseases related to carbohydrate.
- 3.8 Deficiency of carbohydrate.

## Part 1V

Fats or Lipids



- 4.1 Functions.
- 4.2 Forms and classes of Fatty acids.
- 4.3 Cholesterol.
- 4.4 Sources of dietary cholesterol.
- 4.5 Trance fats and Hydrogenated fats.
- 4.6 HDL & LDL.
- 4.7 Sources of fats related with tat diseases.

## **Part V**

Protins and amino acids

- 5.1 types of amino acids.
- 5.2 Complet and Incoplet proteins.
- 5.3 Function of protein.
- 5.4 Sources of proteins.
- 5.5 Incomplet proteins.
- 5.6 common diseaes.

## **Part V1**

Vitamins

- 6.1 Vitamins terminology.
- 6.2 Fat soluble vitamins.
- 6.3 Health benefit of vitamins for variety of diseases.
- 6.4 Food sources.
- 6.5 defeciency.
- 6.6 Toxisity.
- 6.7 Water soluble vitamins.
- 6.8 Health benefit of vitamins for variety of diseases.
- 6.9 food sources.



6.10 Defeciency.

6.11 Toxisty.

### **Part V11**

Minerals

7.1 Trace Minerals.

7.2 Major Minarls.

### **Part V111**

Water and metabolism

### **Part 1X**

Nutrition inpregnancy, lactation and life cycle

9.1 Nutrition in lactation.

9.2 Factors affecting milk secretion.

9.3 Advantages of brest feeding.

9.4 nutrition for preschool.

9.5 Nutrtrion for school child.

9.6 Nutrition for adolscents.

9.7 Nutrition for Elderly.

### **Part X**

Antioxident Phytochemical

10.1 Allicin.

10.2 Flavanoide.

10.3 Lutein.



### إرشادات للطلبة

- الرغبة والحماس للتعليم
- كن مشاركاً في جميع الأنشطة
- احترم أفكار المدرس والزملاء
- أنقد أفكار المدرس والزملاء بأدب إن كانت هناك حاجة.
- احرص على استثمار الوقت
- تقبل الدور الذي يسند إليك في المجموعة
- حفز أفراد مجموعتك في المشاركة في النشاطات
- احرص على بناء علاقات طيبة مع المدرس والزملاء أثناء المحاضرة
- احرص على ما تعلمته في المحاضرة وطبقه في الميدان .
- ركز ذهنك بالتعليم و احرص على التطبيق المباشر
- تغلق الموبايل قبل الشروع بالمحاضرة



## الوحدة الأولى - المحاضرة الأولى - الزمن: 120 دقيقة

### أهداف المحاضرة الأولى:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على:

Understands digestion, metabolism and the difference between them.

Understands the physiologic value of nutrients and nutrition classification

### موضوعات المحاضرة الأولى:

Intruduction to nutrion

1. The digestive system and metabolism.
2. Pysiologic value of food.
3. Nutrition classiffication.
4. food guide pyramid.

### الأساليب والأنشطة والوسائل التعليمية

الوسائل التدريبية	الأساليب والأنشطة التدريبية	م
• جهاز حاسوب • جهاز عرض • سبورة • اوراق واقلام	• نشاط التعارف (1/1/1) • محاضرة • مناقشة • سؤال وجواب	1



## خطة إجراءات تنفيذ المحاضرة الاولى

الزمن بالدقيقة	الإجراءات	المحاضرة	الوحدة
120 دقيقة	الترحيب بالطلبة والتعارف معهم	الأولى	الأولى
	التعريف بالبرنامج وأهدافه وأهميته		
	اللقاء المحاضر		

## المادة العلمية:

### What is the digestive system?

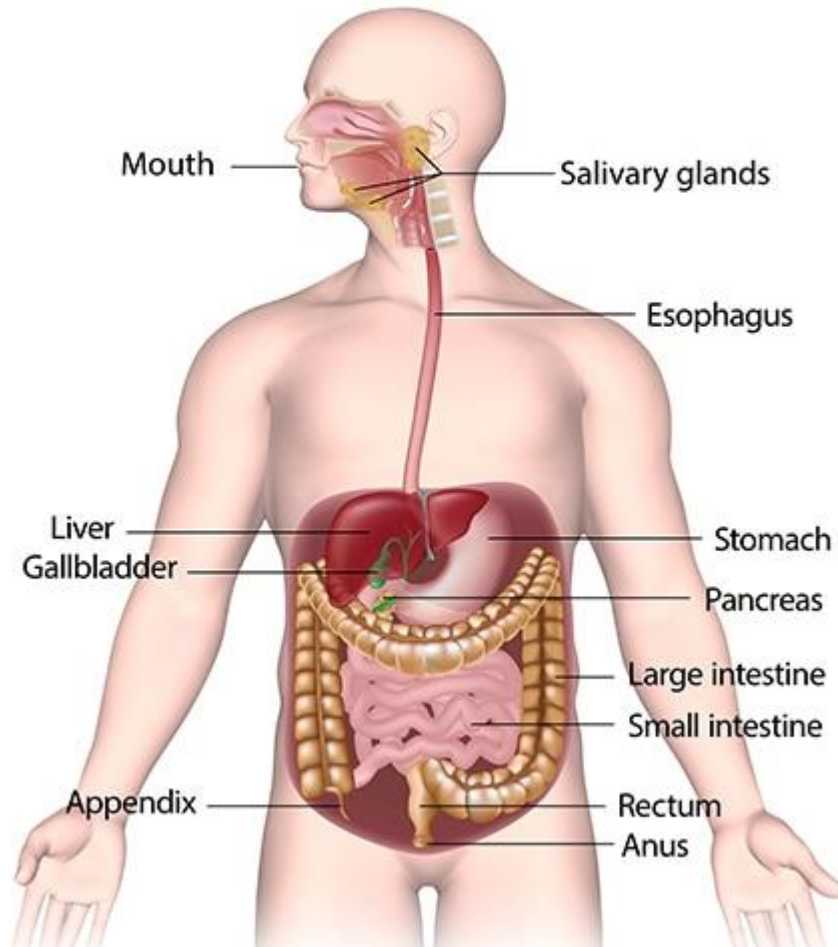
The digestive system is made up of the gastrointestinal tract and the [liver](#), [pancreas](#), and gallbladder. The [GI tract](#) is a series of hollow organs joined in a long, twisting tube from the mouth to the [anus](#). The hollow organs that make up the GI tract are the mouth, [esophagus](#), stomach, small intestine, large intestine, and anus. The liver, pancreas, and gallbladder are the solid organs of the digestive system.

The small intestine has three parts. The first part is called the duodenum. The jejunum is in the middle and the ileum is at the end. The large intestine includes the [appendix](#), cecum, [colon](#), and rectum. The appendix is a finger-shaped pouch attached to the cecum. The cecum is the first part of the large intestine. The colon is next. The rectum is the end of the large intestine.

Bacteria in your GI tract, also called gut flora or microbiome, help with [digestion](#). Parts of your [nervous](#) and [circulatory](#) systems also help. Working together, nerves, [hormones](#), bacteria, blood, and the organs of your digestive system digest the foods and liquids you eat or drink each day.



## The Digestive System



### Why is digestion important?





Digestion is important because your body needs nutrients from food and drink to work properly and stay healthy. [Proteins](#), [fats](#), [carbohydrates](#), [vitamins](#) —, [minerals](#) —, and water are nutrients. Your digestive system breaks nutrients into parts small enough for your body to absorb and use for energy, growth, and cell repair.

- Proteins break into [amino acids](#)
- Fats break into fatty acids and glycerol
- Carbohydrates break into simple [sugars](#)

The **main difference** between digestion and metabolism is that **digestion is a type of [catabolism](#) event responsible for the breaking down of large molecules into small molecules whereas metabolism comprises of both catabolism and [anabolism](#), breaking down large molecules and making large molecules from the small molecules**. Furthermore, digestion involves both mechanical and biochemical processes while metabolism only involves in biochemical processes.

Digestion and metabolism are two processes that occur in animals bodies to produce energy and to maintain other cellular processes.

## What is Digestion

Digestion is one of the four processes responsible for obtaining nutrients by higher animals. The other three are the [ingestion](#), absorption of nutrients, and the elimination of waste. Here, the absorption of nutrients follows the digestion of food. Generally, digestion occurs in the alimentary canal of higher animals. But, in single-celled animals, it occurs inside vacuoles in the cytoplasm. The main importance of digestion is the breaking down of large food particles into small molecules, which can be readily absorbed by the digestive tract. Furthermore, digestion occurs by means of both mechanical and chemical digestion.

## Mechanical Digestion

Mechanical digestion is responsible for the breaking down of large food particles into small particles, facilitating the chemical digestion. Moreover, the three events of mechanical digestion are chewing in the mouth, churning in the stomach, and segmentation in the small intestine. Chewing occurs by the action of teeth in the mouth while churning is the squeezing and mixing up of food with the gastric juice by the action of the muscles of the stomach. Furthermore,



segmentation is the process responsible for the propulsion and the mechanical digestion of food through the small intestine.

### Chemical Digestion

Moreover, chemical digestion is responsible for the breaking down of high molecular weight molecules into small molecules. Also, the digestive enzymes secreted by various glands along the digestive tract drive this process. Furthermore, acids and bile facilitate the enzymatic action. During chemical digestion, carbohydrates, proteins, lipids, and nucleic acids are broken down into their monomeric forms. Therefore, chemical digestion can be considered as a catabolic process.

### What is Metabolism

Metabolism is the collection of all biochemical reactions that occur inside the body of living organisms. It occurs through three main phases. The first phase is the catabolism in which carbohydrates, proteins, fats, and nucleic acids in food are broken down into their small monomer units and nitrogenous wastes are eliminated. The second phase is the production of energy by using the resultant monomers such as glucose. Moreover, the third phase is the anabolism in which small monomer units polymerize to form complex molecules such as polypeptides, lipids polysaccharides, and nucleic acids. Ultimately, all of these biochemical reactions are responsible for the organism's growth, development, maintenance of structures, reproduction and response to the outside environment.



# DIGESTION VERSUS METABOLISM

## DIGESTION

The process in the alimentary canal by which food is broken up physically, as by the action of the teeth, and chemically, as by the action of enzymes, and converted into a substance suitable for absorption and assimilation into the body

Both mechanical and biochemical processes occur

Only catabolism occurs

Only occurs in animals

Occurs in the digestive system

## METABOLISM

The sum of the physical and chemical processes in an organism by which its material substance is produced, maintained, and destroyed, and by which energy is made available

Only biochemical processes occur

Both catabolism and anabolism occur

Occurs in all living organisms including animals and plants

Occurs inside the cell

Visit [www.PEDIAA.com](http://www.PEDIAA.com)



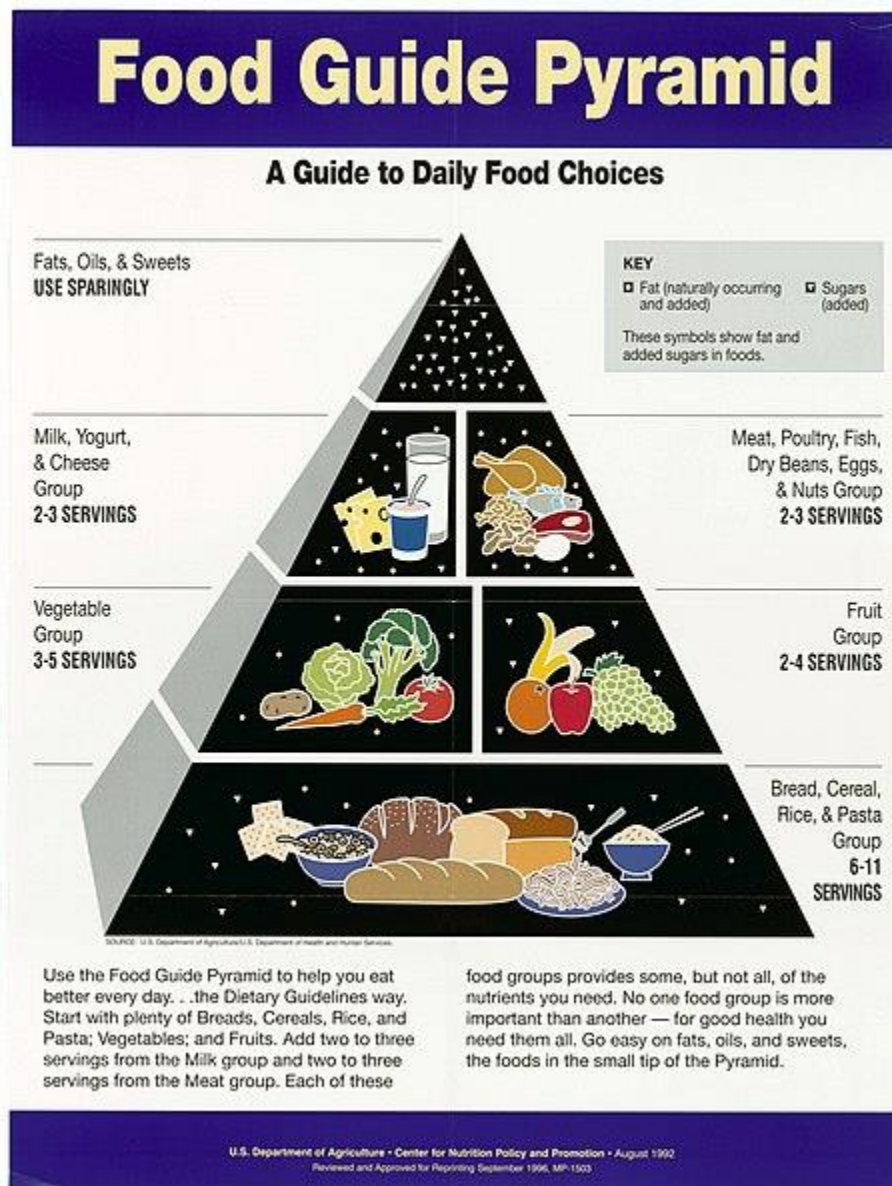
**Human nutrition**, process by which substances in food are transformed into body tissues and provide energy for the full range of physical and mental activities that make up human life.

The study of human nutrition is interdisciplinary in character, involving not only physiology, biochemistry, and molecular biology but also fields such as psychology and anthropology, which explore the influence of attitudes, beliefs, preferences, and cultural traditions on food choices. Human nutrition further touches on economics and political science as the world community recognizes and responds to the suffering and death caused by malnutrition. The ultimate goal of nutritional science is to promote optimal health and reduce the risk of chronic diseases such as cardiovascular disease and cancer as well as to prevent classic nutritional deficiency diseases such as kwashiorkor and pellagra.

### **Utilization of food by the body**

#### **Calories and kilocalories: energy supply**

The human body can be thought of as an engine that releases the energy present in the foods that it digests. This energy is utilized partly for the mechanical work performed by the muscles and in the secretory processes and partly for the work necessary to maintain the body's structure and functions. The performance of work is associated with the production of heat; heat loss is controlled so as to keep body temperature within a narrow range. Unlike other engines, however, the human body is continually breaking down (catabolizing) and building up (anabolizing) its component parts. Foods supply nutrients essential to the manufacture of the new material and provide energy needed for the chemical reactions involved.





## الوحدة الثانية - المحاضرة الاولى - الزمن: 120 دقيقة

### أهداف المحاضرة الاولى:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على:

Knows and understands the recommended dietary allowance and energy nutrient intake.  
Know the lists of food exchange

### موضوعات المحاضرة الاولى:

Planing for healthy diet

1. recommended dietary allownce.
2. recommended energy nutrient intake.
3. food exchange list.

### الأساليب والأنشطة والوسائل التعليمية

الوسائل التدريبية	الأساليب والأنشطة التدريبية	م
<ul style="list-style-type: none"><li>• جهاز حاسوب</li><li>• جهاز عرض</li><li>• سبورة</li><li>• اوراق واقلام</li></ul>	<ul style="list-style-type: none"><li>• نشاط الترحيب بالطلبة (1/1/2)</li><li>• محاضرة</li><li>• مناقشة</li><li>• سؤال وجواب</li></ul>	1



## خطة إجراءات تنفيذ المحاضرة الاولى

الزمن بالدقيقة	الإجراءات	المحاضرة	الوحدة
120دقيقة	الترحيب بالطلبة واعادة بعض النقاط المهمة من المحاضره السابقه	الاولى	الثانيه
	التعريف بالبرنامج وأهدافه وأهميته		
	اللقاء المحاضره		

### المادة العلمية:

Planning for healthy diet

Figuring out how much to eat while achieving or maintaining a healthy weight can be difficult. [Getting the proper nutrients](#) and eating the right amount for your weight



and activity level can contribute to healthy aging. This article provides suggestions for how older adults can get the nutrients they need within a recommended daily number of calories.

### How many calories do you need?

A calorie is a unit of measurement that describes how much energy is released when your body breaks down food. Although calorie count alone does not dictate whether a food is nutritious, thinking about how many calories you need can guide healthy eating habits. If you are over age 60 and you want to maintain your current weight, how many calories do you need to eat each day? The [Dietary Guidelines](#) suggest:

For a Woman	Calories
Not physically active	1,600
Moderately active	1,800
Active lifestyle	2,000-2,200

For a Man	Calories
Not physically active	2,000-2,200
Moderately active	2,200-2,400
Active lifestyle	2,400-2,600





Unsure which activity category you're in? Consult the [Dietary Guidelines](#) for definitions of each level. You can increase your [physical activity level](#) by adding walking, jogging, dancing, recreational sports, and other similar approaches to your day.

## Serving and portion sizes

A “serving size” is a standard amount of a food, such as a cup or an ounce. Serving sizes can help you when choosing foods and when comparing similar items while shopping, but they are not recommendations for how much of a certain food to eat.

The term “portion” means how much of a food you are served or how much you eat. A portion size can vary from meal to meal. For example, at home you may serve yourself two small pancakes in one portion, but at a restaurant, you may get a stack of four pancakes as one portion. A portion size may also be bigger than a serving size. For example, the serving size on the [nutrition label](#) for your favorite cereal may be 1 cup, but you may actually pour yourself 1½ cups in a bowl.

Portion size can be a problem when eating out. To keep your portion sizes under control, try ordering smaller appetizers instead of an entrée as your meal, or share an entrée with a friend. Or eat just one-half of an entrée and take the rest home to enjoy as a meal the next day.

## Healthy food shifts

Eating the right amount is important, but so is making sure you're getting all the nutrients you need. Older adults often need fewer calories, but more nutrients, which makes it essential to eat nutrient-dense foods. To eat nutrient-dense foods across all the [food groups](#), you may need to make some changes in your food and beverage



choices. You can move toward a [healthier eating pattern](#) by making shifts in food choices over time. Here are some id



**Shift from:**

**High-calorie snacks**



**Shift to:**

**Nutrient-dense snacks**



**Fruit products with added sugars**



**Fresh fruit**



**Refined grains**



**Whole grains**



**Snacks with added salt or sugars**



**Snacks without added salt or sugars**



**Solid fats**



**Oils**





## Healthy beverage shifts

It's easy to forget about calories you consume from beverages. If you drink sodas, creamy and sweet coffee drinks, or alcohol, swapping them out for healthier options can make a huge difference. There are plenty of beverage options that are low in added sugars, saturated fats, and sodium. Here are some options:



**Shift from:**

**Shift to:**

Medium café latte made with whole milk

Small café latte made with fat-free milk



Regular cola

Water or water flavored with fruits  
or vegetables



Sweetened lemon iced tea

Sparkling water with natural lemon flavor





## الوحدة الثانية - المحاضرة الثانية - الزمن: 120 دقيقة

### أهداف المحاضرة الثانية:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على

Knows and understands nutritional labeling and density.

Understands the basal metabolic rate and the factors affect it.

### موضوعات المحاضرة الثانية:

nutritional labeling.  
nutritional density.  
basal metabolic rate.  
factors affect B.M.R

### الأساليب والأنشطة والوسائل التعليمية

الوسائل التدريبية	الأساليب والأنشطة التدريبية	م
<ul style="list-style-type: none"><li>• جهاز حاسوب</li><li>• جهاز عرض</li><li>• سبورة</li><li>• اوراق واقلام</li></ul>	<ul style="list-style-type: none"><li>• نشاط الترحيب بالطلبة (1/2/2)</li><li>• محاضرة</li><li>• مناقشة</li><li>• سؤال وجواب</li></ul>	2



## خطة إجراءات تنفيذ المحاضرة الثانية

الزمن بالدقيقة	الإجراءات	المحاضرة	الوحدة
120 دقيقة	الترحيب بالطلبة واعادة بعض النقاط المهمة من المحاضره السابقه	الثانيه	الثانيه
	التعريف بالبرنامج وأهدافه وأهميته		
	اللقاء المحاضره		

## المادة العلمية:

### 100-calorie snacks

Another way to think about the idea of nutrient-dense and calorie-dense foods is to look at a variety of foods that all provide the same calories. Let's say that you wanted to have a small snack. You might choose:

- A 7- or 8-inch banana
- 20 peanuts
- 3 cups low-fat popcorn
- Two regular chocolate-sandwich cookies
- 1/2 cup low-fat ice cream



- One scrambled large egg cooked with oil
- 2 ounces baked chicken breast with no skin

These choices all have about 100 calories but provide different amounts of nutrients. The right choice for you may depend on what else you're eating throughout the day.

Eating healthy is not just about how much you eat, it's also about what you eat. Older adults should try to eat foods that are packed with nutrients while limiting foods that are high in calories but provide few nutrients. Swapping out snacks and beverages with nutrient-dense alternatives can help you get the nutrients you need while staying within your recommended number of calories.

What is Nutrition Labeling? Nutrition labeling is **a requirement from the FDA on most beverages and packaged foods**. These labels, also called the Nutrition Facts label, show the nutrient content of a food product to consumers and guide them in food selection.

**Nutrient density** identifies the amount of beneficial [nutrients](#) in a food product in proportion to e.g. [energy content](#), weight or amount of detrimental nutrients. Terms such as **nutrient rich** and **micronutrient dense** refer to similar properties.

According to the [World Health Organization](#), [nutrient profiling](#) classifies and/or ranks foods by their nutritional composition in order to promote human health and to prevent disease. Ranking by nutrient density is one such nutrient profiling strategy. Ordering foods by nutrient density is a statistical method of comparing foods by the proportion of nutrients in foods. Some such comparisons can be the [glycemic index](#) and the [overall nutritional quality index](#).

When the density is defined in proportion to energy contents, nutrient-dense foods such as [fruits](#) and [vegetables](#) are the opposite of [energy-dense](#) food (also called "[empty calorie](#)" food), such as [alcohol](#) and foods high in added [sugar](#) or processed [cereals](#). Beyond its use to distinguish different *types* of food from each other, nutrient density allows comparison to be made for different examples or samples of the same kind of food. Nutrient density is correlated with soil quality and mineralization levels of the soil, although the relationship is complex and incorporates other dimensions.

**BMR Definition:** Your Basal Metabolic Rate (BMR) is **the number of calories you burn as your body performs basic (basal) life-sustaining function**. Commonly also termed as Resting Metabolic Rate (RMR), which is the calories burned if you stayed in bed all day.

There are many factors that affect the BMR. These include body temperature, age, sex, race, emotional state, climate and circulating levels of hormones like catecholamine's (epinephrine and norepinephrine) and those secreted by the thyroid gland.





### **1. Genetics (Race):**

Some people are born with faster metabolism and some with slower metabolism. Indians and Chinese seem to have a lower BMR than the Europeans. This may as well be due to dietary differences between these races. Higher BMR exists in individuals living in tropical climates. Ex. Singapore.

### **2. Gender:**

Men have a greater muscle mass and a lower body fat percentage. Thus men have a higher basal metabolic rate than women. The BMR of females declines more rapidly between the ages of 5 and 17 than that of males.

### **3. Age:**

BMR reduces with age i.e. it is inversely proportional to age. Children have higher BMR than adults. After 20 years, it drops about 2 per cent, per decade.

### **4. Weight:**

The heavier the weight, the higher the BMR, ex. the metabolic rate of obese women is 25 percent higher than that of thin women.

### **5. Body surface area:**

This is a reflection of the height and weight. The greater the body surface area factor, the higher the BMR. Tall, thin people have higher BMRs. When a tall person is compared with a short person of equal weight, then if they both follow a diet calorie-controlled to maintain the weight of the taller person, the shorter person may gain up to 15 pounds in a year.

### **6. Body fat percentage:**



The lower the body fat percentage, the higher the BMR. The lower body fat percentage in the male body is one reason why men generally have a 10-15% higher BMR than women.

### **7. Diet:**

Starvation or serious abrupt calorie-reduction can dramatically reduce BMR by up to 30%. Restrictive low-calorie weight loss diets may cause BMR to drop as much as 20%. BMR of strict vegetarians is 11% lower than that of meat eaters.

### **8. Body temperature/health:**

For every increase of  $0.5^{\circ}\text{C}$  in internal temperature of the body, the BMR increases by about 7 percent. The chemical reactions in the body actually occur more quickly at higher temperatures. So a patient with a fever of  $42^{\circ}\text{C}$  (about  $4^{\circ}\text{C}$  above normal) would have an increase of about 50 percent in BMR. An increase in body temperature as a result of fever increases the BMR by 14-15% per degree centigrade which evidently, is due to the increased rate of metabolic reactions of the body

### **9. External temperature:**

Temperature outside the body also affects basal metabolic rate. Exposure to cold temperature causes an increase in the BMR, so as to create the extra heat needed to maintain the body's internal temperature. A short exposure to hot temperature has little effect on the body's metabolism as it is compensated mainly by increased heat loss. But prolonged exposure to heat can raise BMR.

### **10. Glands:**

Thyroxine is a key BMR-regulator which speeds up the metabolic activity of the body. The more thyroxine produced, the higher the BMR. If too much thyroxine is produced (thyrotoxicosis) BMR can actually double. If too little thyroxine is produced (myxoedema) BMR may shrink to 30-40 percent of normal rate. Like thyroxine, adrenaline also increases the BMR but to a lesser



extent. Anxiety and tension may not show on the face but they do produce an increased tensing of the muscles and release of norepinephrine even though the subject is seemingly quiet. Both these factors tend to increase the metabolic rate.

### **11. Exercise:**

Physical exercise not only influences body weight by burning calories, it also helps raise the BMR by building extra lean tissue. (Lean tissue is more metabolically demanding than fat tissue.) So more calories are burnt even when sleeping.

### **12. Pregnancy:**

The BMR is not changed during pregnancy. The higher value of BMR in late pregnancy is due to the BMR of the fetus.

### **Significance of BMR:**

1. The determination of BMR is the principal guide for diagnosis and treatment of thyroid disorders.
2. If BMR is less than 10% of the normal, it indicates moderate hypothyroidism. In severe hypothyroidism, the BMR may be decreased to 40 to 50 percent below normal.
3. BMR aids to know the total amount of food or calories required to maintain body weight.
4. The BMR is low in starvation, under nutrition, hypothalamic disorders, Addison's disease and lipoid nephrosis.
5. The BMR is above normal in fever, diabetes insipidus, leukemia and polycythemia.



## الوحدة الثالثة - المحاضرة الاولى - الزمن: 120 دقيقة

### أهداف المحاضرة الاولى:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على

1. Define concepts.
2. Identify the functions of carbohydrates.
3. Compare between soluble and insoluble dietary fibers.
4. Disuses the daily requirements for carbohydrates and fibers.
5. Describe the dietary sources of carbohydrates and fibers.
6. Outline the main therapeutic effect of rich- fiber diet

### موضوعات المحاضرة الاولى:

1. Carbohydrate.
2. Classification of carbohydrate.
3. Simple carbohydrate.
4. Complex carbohydrate.
5. function of carbohydrate.



6. Sources of carbohydrate.
7. Common diseases related to carbohydrate.
8. Deficiency of carbohydrate.

### الأساليب والأنشطة والوسائل التعليمية

الوسائل التدريبية	الأساليب والأنشطة التدريبية	م
<ul style="list-style-type: none"><li>• جهاز حاسوب</li><li>• جهاز عرض</li><li>• سبورة</li><li>• اوراق واقلام</li></ul>	<ul style="list-style-type: none"><li>• نشاط الترحيب بالطلبة (1/1/3)</li><li>• محاضرة</li><li>• مناقشة</li><li>• سؤال وجواب</li></ul>	1

### خطة إجراءات تنفيذ المحاضرة الاولى

الزمن بالدقيقة	الإجراءات	المحاضرة	الوحدة
120دقيقة	الترحيب بالطلبة واعادة بعض النقاط المهمة من المحاضره السابقه	الاولى	الثالثه
	التعريف بالبرنامج وأهدافه وأهميته		
	القاء المحاضره		



## المادة العلمية:

### Carbohydrates

- Carbohydrates are organic compounds composed of carbon, hydrogen, and oxygen.
- They play a significant role in providing cells with energy and supporting the normal functioning of the body.
- Carbohydrates are classified according to the number of saccharides (sugar units), as follows:
  - a. **Monosaccharides** (simple sugars) include glucose, galactose, and fructose.
  - b. **Disaccharides** (double sugars) include sucrose, lactose, and maltose.
  - c. **Polysaccharides** (complex sugars) include glycogen, cellulose (fiber), and starch

### Classification of carbohydrates

1. **Simple carbohydrates** (sugars) and,
2. **Complex carbohydrates** (starches and fibers). as with all nutrients, carbohydrates

### Types of Carbohydrates



- a. **Sugars:** Sugars, the simplest of all carbohydrates, are water soluble and are produced naturally by both plants and animals. Sugars may be monosaccharides (single molecules such as glucose-the most simple sugar- fructose, and galactose) or disaccharides (double molecules).

**Most sugars are produced naturally by plants, especially fruits, sugar cane, and sugar beets. However, other sugars are from an animal source. For example, lactose, a combination of glucose and galactose, is found in animal milk.**

**Processed or refined sugars (e.g., table sugar, molasses, and corn syrup) have been extracted and concentrated from natural sources.**

- b. **Starches:** Starches (polysaccharides) are the insoluble, non-sweet forms of carbohydrate. They are composed of branched chains of dozens or hundreds of glucose molecules. Like sugars, nearly all starches exist naturally in plants, such as grains and potatoes. Other foods, such as cereals, breads, flour, and puddings, are processed from starches.
- c. **Fibers:** Fibers, a complex carbohydrate derived from plants, supplies roughage, or bulk, to the diet. However, fibers cannot be



digested by humans but satisfies the appetite and helps the digestive tract to function effectively and eliminate waste. Fiber is present in the outer layer of grains, bran, and in the skin, seeds, and pulp of many vegetables and fruits.

**Natural sources of carbohydrates also supply vital nutrients, such as protein, vitamins, and minerals that are not found in processed foods.**

## **Carbohydrate Metabolism.**

### **Major enzymes include:**

- Ptyalin (salivary amylase), pancreatic amylase, and the disaccharidases- maltase, sucrase, and lactase and are used in carbohydrate digestion.
- The desired end products of carbohydrate digestion are monosaccharaides, which are absorbed by the small intestine in a healthy person.
- After the body breaks carbohydrates down into glucose, some glucose continues to circulate in the blood to maintain blood levels and to provide a readily available source of energy.





- The remainder is either used as energy or stored, either as glycogen, a large polymer (compound molecule) of glucose, or as fat (glucose that cannot be stored as glycogen is converted to fat), by a process called glycogenesis in the liver and skeletal muscles.
- Insulin, a hormone secreted by the pancreas, enhances the transport of glucose into cells.

### **Function of Carbohydrates.**

**To some extent every body cell depends on glucose. The cells of the nervous system and the brain almost exclusively use glucose for energy.**

- Fibers are different than starches in that they cannot be broken down by the digestive system, and therefore they provide little or no energy for the body.
- Fiber has been shown to protect against heart disease and diabetes by lowering cholesterol and glucose levels.
- Fiber has also been shown to help provide a feeling of fullness, and promote proper bowel function.
- Some examples of good sources of fiber are bran cereals, okra, butter beans, kidney beans, navy beans, sweet potatoes.



## Dietary fiber

- Dietary fiber is a complex mixture of dietary fiber is a complex mixture of plant materials that are resistant to breakdown (digestion) by the human digestive enzymes.
- There are two major kinds of dietary fiber:
  1. **Insoluble** (cellulose, hemicelluloses, and lignin) found in whole-grain products such as whole-wheat bread.

**Insoluble fiber means it does not dissolve in water.**

### Importance of insoluble fibers.

- a. promotes normal elimination by providing bulk for stool formation and thus hastening the passage of the stool through the colon.
- b. helps to satisfy appetite by creating a full feeling.
- c. It also cannot be used by intestinal-colon bacteria as a food source, so these beneficial bacteria generally do not grow and produce intestinal gas.

2. **Soluble** (gums, pectin's) fibers found in fruits, vegetables,



dry beans and peas, and some cereals such as oats.

### **Importance of Soluble fibers**

- a. Some studies indicate that soluble fibers may play a role in reducing the level of cholesterol in the blood.
  - b. It seems to bind up cholesterol allowing it to be eliminated with the stool (10-15%).
- Eating a variety of foods that contain dietary fiber is the best way to promote health.
  - Breads, cereals, other grain products, fruits, vegetables, meat, poultry, fish and alternates are the sources.



### Fibers as therapeutic diet.

Problems/disease	Clinical features	Importance of fiber diet
Irritable bowel syndrome (IBS)	<ul style="list-style-type: none"> <li>altered bowel habits,</li> <li>constipation, diarrhea, or both alternately.</li> <li>bloating, abdominal pain, cramping, and spasm.</li> <li>An attack of IBS can be triggered by emotional. Tension and anxiety, poor dietary habits, and certain medications.</li> </ul>	<ul style="list-style-type: none"> <li>help to relieve the symptoms of irritable bowel syndrome by producing soft bulky stools.</li> <li>helps to normalize the time it takes for the stool to pass through the colon</li> <li></li> </ul>
<b>Colon Polyps/Cancer</b>		<ul style="list-style-type: none"> <li>Fibers produce a large bulky stool may act to dilute these carcinogens by moving them through the bowel more quickly.</li> </ul>



<p><b>Diverticulosis</b></p>	<ul style="list-style-type: none"> <li>• These pockets usually cause no problems.</li> <li>• of infection or inflammation of the sac lining the abdomen (peritonitis).</li> </ul>	<ul style="list-style-type: none"> <li>• A high-fiber diet may increase the bulk in the stool and thereby reduce the pressure within the colon.</li> <li>• A high-fiber diet reduce the formation of pocket.</li> </ul>
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### Sources of carbohydrates

Carbohydrates are found in a wide array of both healthy and unhealthy foods—bread, beans, milk, popcorn, potatoes, cookies, spaghetti, soft drinks, corn, and cherry pie. They also come in a variety of forms. The most common and abundant forms are sugars, fibers, and starches.

### Dietary carbohydrate and disease

- Obesity. The frequency of obesity has increased dramatically in many developed and developing countries.
- Non-insulin dependent diabetes mellitus (NIDDM) ...
- Cardiovascular disease.
- Cancer It's true that too many calories from carbohydrates can lead to weight gain, obesity and increased risk for diseases, including certain types of cancer like **breast and**



**colon cancer.** And carbohydrates with a high glycemic index have been linked to increased lung cancer risk.

- Gastrointestinal diseases other than cancer.
- Dental caries.

A carbohydrate-deficient diet may cause **headaches, fatigue, weakness, difficulty concentrating, nausea, constipation, bad breath and vitamin and mineral deficiencies.**

## الوحدة الرابعه - المحاضرة الاولى - الزمن: 120دقيقة



## أهداف المحاضرة الاولى:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على:

1. Define concepts
2. Identify the functions of lipids
3. Compare between saturated and unsaturated fat.
4. Differentiate between essential and nonessential fatty acids.
5. Discuss the sources of different types of fat.

## موضوعات المحاضرة الاولى:

Fats or Lipids

1. Functions.
2. Forms and classes of Fatty acids.
3. Cholesterol.
4. Sources of dietary cholesterol.
5. Trance fats and Hydrogenated fats.



6. HDL & LDL.  
7. Sources of fats related with tat diseases.

### الأساليب والأنشطة والوسائل التعليمية

الوسائل التدريبية	الأساليب والأنشطة التدريبية	م
<ul style="list-style-type: none"> <li>• جهاز حاسوب</li> <li>• جهاز عرض</li> <li>• سبورة</li> <li>• اوراق واقلام</li> </ul>	<ul style="list-style-type: none"> <li>• نشاط الترحيب بالطلبة (1/1/4)</li> <li>• محاضرة</li> <li>• مناقشة</li> <li>• سؤال وجواب</li> </ul>	<b>1</b>

### خطة إجراءات تنفيذ المحاضرة الاولى

الزمن بالدقيقة	الإجراءات	المحاضرة	الوحدة
120دقيقة	الترحيب بالطلبة واعادة بعض النقاط المهمة من المحاضره السابقه	الاولى	الرابعه
	التعريف بالبرنامج وأهدافه وأهميته		
	القاء المحاضره		





## المادة العلمية:

### Lipids

- Lipids (fats) are organic compounds that are insoluble in water but soluble in inorganic solvents such as ether and alcohol.
- They are composed of the same elements as carbohydrates (carbon, hydrogen, and oxygen) but have a higher hydrogen concentration.

Fats may be liquid (oil) or solid.

- **Fatty acids** are the basic structural units of most lipids.
- Fatty acids are described as saturated or unsaturated.
- **Saturated fatty acids** are those in which all carbon atoms are filled to capacity (i.e., saturated) with hydrogen; an example is butyric acid, found in butter.
- An **unsaturated fatty acid** is one that could accommodate more



hydrogen atoms than it currently does. It has at least two carbon atoms that are not attached to a hydrogen atom; instead, there is a double bond between the two carbon atoms.

- Fatty acids with one double bond are called **monounsaturated fatty acids**; those with more than one double bond (or many carbons not bonded to a hydrogen atom) are **polyunsaturated fatty acids**.
- An example of a polyunsaturated fatty acid is linoleic acid, found in vegetable oil.
- Lipids are classified as simple or compound.
- **Glycerides**, the simple lipids, are the most common form of lipids.
- They consist of a glycerol molecule with up to three fatty acids attached.
- **Triglycerides** (which have three fatty acids) account for more than 90 % of the lipids in food and in the body.
- Triglycerides may contain saturated or unsaturated fatty acids.



- Saturated triglycerides are found in animal products, such as butter, and are usually solid at room temperature.
- Unsaturated triglycerides are usually liquid at room temperature and are found in plant products, such as olive oil and corn oil.
- **Cholesterol** is a fat-like substance that is both produced by the body and found in foods of animal origin. Most of the body's cholesterol is synthesized in the liver; however, some is absorbed from the diet (e.g., from milk, egg yolk, and organ meats).
- Cholesterol is needed to create bile acids and to synthesize steroid hormones.

Cholesterol: The good and the bad

- Two types of lipoproteins carry cholesterol to and from cells. One is low-density lipoprotein, or LDL. The other is high-density lipoprotein, or HDL. A test measures the amount of each type of cholesterol in your blood.
  - LDL (bad) cholesterol
- LDL cholesterol is considered the “bad” cholesterol, because it contributes to fatty buildups in arteries ([atherosclerosis](#)). This narrows the arteries and increases the risk for [heart attack](#), [stroke](#) and [peripheral artery disease](#) (PAD).



- HDL (good) cholesterol
  - HDL cholesterol can be thought of as the “good” cholesterol because a healthy level may protect against heart attack and stroke.
  - HDL carries LDL (bad) cholesterol away from the arteries and back to the liver, where the LDL is broken down and passed from the body. But HDL cholesterol doesn't completely eliminate LDL cholesterol. Only one-third to one-fourth of blood cholesterol is carried by HDL.
- 
- Along with phospholipids, large quantities of cholesterol are present in cell membranes as well as other cell structures.

## Lipid Digestion

- Although chemical digestion of lipids begins in the stomach, they are digested mainly in the small intestine, primarily by bile, pancreatic lipase, and enteric lipase, an intestinal enzyme.
- The end products of lipid digestion are glycerol, fatty acids, and cholesterol.

**These are immediately reassembled inside the intestinal cells into triglycerides and cholesterol esters (cholesterol with a fatty acid attached to it), which are not water soluble.**

- For these reassembled products to be transported and used, the



small intestine and the liver must convert them into soluble compounds called lipoproteins.

- **Lipoproteins** are made up of various lipids and a protein.

## Lipid Metabolism

- Converting fat into usable energy occurs through the use of the enzyme hormone-sensitive lipase that breaks down triglycerides in adipose cells, releasing glycerol and fatty acids into the blood.
- 0.45 kg of fat provides 3,500 kilocalories.
- Fasting persons will obtain most of their calories from fat metabolism, but some amount of carbohydrate or protein must also be used because the brain, nerves, and red blood cells require glucose.
- Only the glycerol molecules in fat can be converted to glucose.

### The function of Lipids and essential fatty acids.

1. Provide 60% of energy needs at rest.
2. Spares protein, insulates human bodies against extreme temperatures.
3. Protects against shock by providing a cushion for bones and vital organs.



4. help to maintain cell membranes and aids in the absorption of vitamins A,D,E and K.
5. As a food ingredient, fat provides flavor. consistency, stability and satiety.

### Unsaturated fats

- It is most effective dietary strategy in preventing heart disease may be replacing saturated fats in the diet with monounsaturated and polyunsaturated fats.
- **Sources of monounsaturated fats:** Olive oil, canola oil, peanut oil and avocados.
- **Sources of polyunsaturated fats:** Vegetable oils (safflower, sesame, soy, corn and sunflower), nuts and seeds.

### Essential fatty acids

- the body can make all except two linoleic and linolenic acids. These two acids must be supplied by the diet.
- **Linoleic acid sources:** Sunflower, safflower, corn and soybean oils.
- **Linolenic acid sources:** Soybean and canola oils, walnuts and salmon.



## Saturated fats and its risk.

- Saturated fat is implicated in raising LDL cholesterol
- LDL cholesterol raises risk of heart disease

### Sources of saturated fats

1. animal sources such as: whole milk, cream, butter, cheese and fatty cuts of beef and pork.
2. Coconut.
3. palm and palm kernel oils and products containing them (pastries, pies, doughnuts and cookies and the like) are also sources of saturated fat.

### Trans fat

- The majority of trans fats are formed when liquid oils are made into solid fats like hard margarine.
- However, it is found naturally in some animal based foods as well.
- Trans fat is made when hydrogen is added to an unsaturated fat such as vegetable oil, in a process called hydrogenation.



- Hydrogenation increases the shelf life of products containing these fats.

### Sources of Trans fat

1. Found in deep fried foods.
2. cakes, cookies, margarine, meat and dairy products.
3. Partially hydrogenated oils are the main dietary source of trans fats.

**Trans fat risks:** Trans fats, like saturated fats, can increase the LDL bloodcholesterol levels and increase the risk of heart disease.

Fats related to some diseases such as diabetes mellitus, heart and vascular disease, cancer (breast, colon and Prostate cancers)

الوحدة الخامسة - المحاضرة الاولى - الزمن: 120 دقيقة





## أهداف المحاضرة الاولى:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على :

1. define concepts
2. discuss the roles of proteins in the body.
3. Compare between complete and incomplete proteins.
4. Mentions the sources for each type of proteins
5. Describe the effect of proteins on the body weight.
6. Discus the daily requirement for protein.

## موضوعات المحاضرة الاولى:

Protins and amino acids

1. types of amino acids.
2. Complet and Incoplet proteins.
3. Function of protein.
4. Sources of proteins.
5. Incomplet proteins.
6. common diseaes.



## الأساليب والأنشطة والوسائل التعليمية

الوسائل التدريبيه	الأساليب والأنشطة التدريبيه	م
<ul style="list-style-type: none"><li>• جهاز حاسوب</li><li>• جهاز عرض</li><li>• سبورة</li><li>• اوراق واقلام</li></ul>	<ul style="list-style-type: none"><li>• نشاط الترحيب بالطلبه (1/1/5)</li><li>• محاضرة</li><li>• مناقشة</li><li>• سؤال وجواب</li></ul>	1

## خطة إجراءات تنفيذ المحاضرة الاولى

الزمن بالدقيقة	الإجراءات	المحاضرة	الوحدة
120دقيقة	الترحيب بالطلبة واعادة بعض النقاط المهمه من المحاضره السابقه	الاولى	الخامسه
	التعريف بالبرنامج وأهدافه وأهميته		
	اللقاء المحاضره		

## المادة العلمية:



## Proteins

- Proteins are organic compounds that contain carbon ,hydrogen, oxygen, andnitrogen atoms; some proteins also contain sulfur.
- After water, proteins are the most abundant intracellular substance
- Proteins are essential for almost every bodily function, beginning with thegenetic control of protein synthesis, cell function, and cell reproduction.
- The end products of protein digestion are amino acids.
- Every cell in the body contains some protein, and about three quarters of bodysolids are proteins.
- Amino acids are basic structural units of proteins and categorized as essential ornonessential.

### a. Essential amino acids

- are those that cannot be manufactured in the body and must besupplied in the diet.
- Nine essential amino acids-histidine, isoleucine, leucine,



lysine, methionine, phenylalanine, tryptophan, threonine, and valine are necessary for tissue growth and maintenance.

- A tenth, arginine, appears to have a role in the immune system.

#### **b. Nonessential amino acids**

- are those that the body can manufacture.
- Nonessential amino acids include alanine, aspartic acid, cysteine, glutamic acid, glycine, hydroxyproline, proline, serine, and tyrosine.

### **Plasma proteins**

- Plasma proteins , mainly in the form of albumin and globulin , are organic compounds of large molecular size .
- They do not as freely across membranes as electrolytes, which are much smaller.
- Thus plasma protein molecules are retained in blood vessels , controlling water movement in the body and maintaining blood volume by influencing the shift of water in and out of capillaries in balance with the surrounding water .
- In this function plasma proteins re called colloids , which exert



colloidal osmotic pressure (COP) to maintain integrity of the blood volume .

## Protein Digestion

- Digestion of protein foods begins in the mouth, where the enzyme *pepsin* breaks protein down into smaller units.
- Most proteins are digested in the small intestine.
- The pancreas secretes the proteolytic enzymes trypsin, chymotrypsin, and carboxy peptidase; glands in' the intestinal wall secrete amino peptidase and dipeptidase.
- These enzymes break protein down into smaller molecules and eventually into amino acids.
- Amino acids are absorbed by active transport through the small intestine into the portal blood circulation.
- The liver uses some amino acids to synthesize specific proteins (e.g., liver cells and the plasma proteins albumin, globulin, and fibrinogen).



## Storage

- Plasma proteins are a storage medium that can rapidly be converted back into amino acids.
- Other amino acids are transported to tissues and cells throughout the body where they are used to make protein for cell structures. In a sense, protein is stored as body tissue.
- The body cannot actually store excess amino acids for future use.

## Protein Metabolism

**Protein metabolism includes three activities: anabolism (building tissue), catabolism (breaking down tissue), and nitrogen balance.**

- **ANABOLISM.** All body cells synthesize proteins from amino acids. The types of proteins formed depend on the characteristics of the cell and are controlled by its genes.
- **CATABOLISM.** Because a cell can accumulate only a limited amount of protein, excess amino acids are degraded for energy or converted to fat. Protein degradation occurs primarily in the liver.



## The role of proteins in the body

1. Whenever our body is growing, repairing or replacing tissue, proteins are involved .
2. Proteins form the building blocks of bones, teeth, muscles, skin and blood.
3. In addition, proteins help to regulate fluid balance; act as enzymes, act as transporters and some hormones are proteins as well.
4. As antibodies, proteins also help with the body's defense against disease.
5. Proteins can also be used as a source of energy if needed

## Complete and Incomplete Proteins

**Complete Proteins** contain an of the **essential amino acids** needed for growth.

### Sources of Complete Proteins

- a. animals like meat, fish, poultry.
- b. cheese, eggs, yogurt and milk .

**Incomplete Proteins** are **missing one or more essential amino acids** needed for growth.



## Sources of Incomplete Proteins

- Incomplete proteins are found in the plant form.
- Vegetables, seeds, nuts, grain and legumes.

## Complementary proteins

- Two or more dietary proteins whose amino acid composition complement each other in such a way that the essential amino acids missing from one are supplied by the other.
- By combining two or more plant proteins we can consume all of the essential amino acids needed to support growth.
- We can receive all of the amino acids we need over the course of a day by choosing a variety of grains, legumes, seeds, nuts, and vegetables.

**The RDA for adults is 0.8 grams of protein per kg/body weight/ day.**

**Biological Value of a Protein (BVP) It is a measurement of protein quality expressing the rate of efficiency with which protein is used for growth.**

- A protein with high BV has all the essential amino acids in the right proportion. The BVP can be calculated by using a formula.





$$\begin{aligned}
 \text{BVP} &= \frac{\text{N Intake} - (\text{Excretion in urine and feces})}{\text{N Intake} - \text{N Excretion in feces}} \times 100 \\
 &= \frac{\text{N Retained}}{\text{N absorbed}} \times 100
 \end{aligned}$$

- Egg contains the highest quality food protein known.
- It is so nearly perfect, in fact that egg protein is often the standard by which all other proteins are judged .
- Based on the essential amino acids It provides, egg human nutrition. on a scale with 100 representing top efficiency, these are the biological values of proteins m several foods.

### Recommended Daily Allowance for Protein

Whole egg	93.7
Milk	84.5
Fish	76.0
Beef	74.3
Soybeans	72.8
Rice, polished	64.0
Wheat, whole	64.0
Corn	60.0
Beans, dry	58.0



- Protein from animal sources (meat, fish dairy products, egg white) is considered high biological value protein or a "complete" protein because all nine essential amino acids are present in these proteins.
- An exception to this rule is collagen-derived gelatin which is lacking in tryptophan.

### **Nitrogen balance**

- This is when a person's daily intake of nitrogen from proteins equals the daily excretion of nitrogen's.
- If a person .excretes more nitrogen than he consumes his .body will break down muscle tissue to get the nitrogen it needs(Negative nitrogen state) Muscle loss occurs.

If a person consume more nitrogen than he excrete he will be in an anabolic muscle building - state (positive nitrogen state)

## **الوحدة السادسة - المحاضرة الأولى - الزمن: 120 دقيقة**

### **أهداف المحاضرة الاولى:**

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على:



1. Define vitamin
2. discuss the functions and metabolism of vitamins.
3. Compare between water-soluble protein and Fat-soluble vitamins.
4. Identify the main sources for each of water-soluble protein and Fat-soluble vitamins.
5. Describe the daily requirements for each vitamin.

## موضوعات المحاضرة الاولى:

### Part V1

#### Vitamins

- 6.1 Vitamins terminology.
- 6.2 Fat soluble vitamins.
- 6.3 Health benefit of vitamins for variety of diseases.
- 6.4 Food sources.
- 6.5 deficiency.
- 6.6 Toxicity.
- 6.7 Water soluble vitamins.
- 6.8 Health benefit of vitamins for variety of diseases.
- 6.9 food sources.
- 6.10 Deficiency.
- 6.11 Toxicity.

## الأساليب والأنشطة والوسائل التعليمية

الوسائل التدريبية	الأساليب والأنشطة التدريبية	م
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• جهاز حاسوب	• نشاط الترحيب بالطلبة (1/1/6)	1
• جهاز عرض	• محاضرة	
• سبورة	• مناقشة	
• اوراق واقلام	• سؤال وجواب	

ملاحظة: للتدريسي حرية في تغيير الاساليب والانشطة والوسائل حسب ما يراه مناسباً

### خطة إجراءات تنفيذ المحاضرة الاولى

الزمن بالدقيقة	الإجراءات	المحاضرة	الوحدة
90 دقيقة	الترحيب بالطلبة والتعارف معهم التعريف بالبرنامج وأهدافه وأهميته	الأولى	السادسة

المادة العلمية:



## Vitamins

- Vitamins are organic compounds that regulate cellular metabolism, assisting the biochemical processes that release energy from digested food.
- Vitamins are called micronutrients because they are needed in small quantities when compared with other nutrients (water, carbohydrates, proteins, and fats).
- Vitamin requirements are dependent on many factors, such as:
  - a. body size.
  - b. amount of exercise.
  - c. rate of growth, and,
  - d. pregnancy.
- Vitamins cannot be manufactured by the body in sufficient quantities to sustain life, so it must be supplied by the diet .



- The total volume of vitamins a healthy person normally requires each day would barely fill a teaspoon , Thus the units of measure for vitamins ( e.g. milligrams or micrograms ) , all vitamins are essential to life
- Thus, when vitamins are lacking in the diet, metabolic deficits result

### Classifications of vitamins

**A: Water-soluble vitamins**, include :

1. Vitamin C and ,
2. B-complex vitamins:
  - B 1(thiamine),
  - B (riboflavin),
  - B3 (niacin or nicotinic acid),
  - B6 (pyridoxine),
  - B~ (folic acid),
  - B 12 (cobalamin),
  - pantothenic acid, and biotin.



**The body cannot store water-soluble vitamins; thus, people must get a daily supply in the diet. Water-soluble vitamins can be affected by food processing, storage, and preparation.**

**B: Fat-soluble vitamins, include :**

1. Vitamin A.
  2. Vitamin D.
  3. Vitamin E, and,
  4. Vitamin K.
- The body can store these vitamins, although there is a limit to the amounts of vitamins E and K the body can store.
  - Therefore, a daily supply of fat-soluble vitamins is not absolutely necessary.
  - Vitamin content is highest in fresh foods that are consumed as soon as possible after harvest.

### **Functions of Vitamins**



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**Although each vitamin has specific metabolic task , general functions of vitamins are**

1. components of coenzymes .
2. antioxidants .
3. hormones that affect gene expression .
4. a component of cell membranes , and
5. a component of the light – sensitive rhodopsin molecule in the eyes ( vitaminA)

**Vitamin metabolism**

- The way in which our bodies digest , absorb , and transport vitamins depends on the vitamin's solubility .
- Vitamins traditionally are classified as either fat soluble or water soluble
- The fat – soluble vitamins are A,D,E, and K .
- The water – soluble vitamins are C and all the B vitamins .

**Fat – Soluble vitamins**

- Unlike water – soluble vitamins fat – soluble vitamins can be





stored in the liver and in adipose tissue for long periods.

- The body uses this reserve in times of inadequate intake.
- Fat – soluble vitamin accumulation in the liver and in adipose tissue in the reason excess intake can result in toxicity overtime.

### Water – Soluble vitamins

- With the exception of vitamins B12 and B6 the body does not store water – soluble vitamins to any significant extent.
- Therefore, the body does not have a reserve supply and requires foods rich in water – soluble vitamins daily.

### Fat soluble vitamins

Vitamin	functions	Sources
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<p><b>Vitamin A</b> (retinol, retinal, retinoic acid)</p>	<ul style="list-style-type: none"> <li>• Epithelial tissue proliferation</li> <li>• Retinal pigmentation</li> <li>• Immune system (antigen recognition).</li> </ul> <p>Antioxidant</p>	<p>Whole milk and whole milk products, eggs, fruits and vegetables (green leafy and yellow), fish, animal liver, fish liver oil.</p> <p><b>Caution:</b> Do not exceed a daily dose of over 10,000 international units if pregnant or history of liver disease</p>
<p><b>Vitamin D</b> (cholecalciferol, ergosterol)</p>	<ul style="list-style-type: none"> <li>• Bone and tooth development.</li> <li>• Enhances immunity</li> </ul>	<p>Fortified milk, margarine, eggs, fish, cod liver oil, oatmeal, sweet potatoes, vegetable oils</p>
<p><b>Vitamin E</b> Vitamin E (tocopherol)</p>	<ul style="list-style-type: none"> <li>• Synthesis of heme.</li> <li>• Antioxidant.</li> <li>• prevents oxidation of polyunsaturated fatty acids and of vitamins A and C</li> </ul>	<p>Cold-pressed vegetable oils, dark green leafy vegetables, milk, eggs, meats, legumes, nuts, seeds, whole grains</p>



<b>Vitamin K</b>	<ul style="list-style-type: none"> <li>• Formation of prothrombin, blood clotting Bone formation &amp;</li> <li>• repair; synthesis of osteocalcin.</li> </ul>	Dark green leafy vegetables, asparagus, broccoli, Brussels sprouts, cabbage, cauliflower, egg yolks, liver, oatmeal, oats, rye, safflower oil, soy beans, wheat
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### Water soluble vitamins

<b>Vitamin</b>	<b>functions</b>	<b>Sources</b>
<b>B complex</b> <b>Vitamin B1</b> <b>(thiamine)</b>	<ul style="list-style-type: none"> <li>• Metabolism of carbohydrates and some amino acids (energy).</li> <li>• production of hydrochloric acid.</li> <li>• Enhances circulation and,</li> <li>• assists in blood formation</li> </ul>	Pork, fish, eggs, poultry, dried beans, whole grains, wheat germ, oatmeal, bread, pasta, brown rice, legumes, rice bran, peanuts
<b>Vitamin B2</b> <b>(riboflavin)</b>	<ul style="list-style-type: none"> <li>• Oxidation and reduction of carbohydrates, fats, and proteins.</li> <li>• Red blood cell (RBC) formation.</li> <li>• antibody production</li> </ul>	Milk, whole grains, green vegetables, liver, cheese, egg yolks, fish, legumes, meat, poultry, yogurt



<b>Vitamin B6 (pyridoxine)</b>	<p>Functions as coenzyme to:</p> <ul style="list-style-type: none"> <li>• protein and amino acid metabolism.</li> <li>• absorption of fats and protein</li> </ul>	Whole grains, liver, fish, poultry, green beans, meats, nuts, potatoes, eggs, brewer's yeast
<b>Vitamin B12 (cobalamin compounds)</b>	<ul style="list-style-type: none"> <li>• Metabolically functions as a coenzyme: hydrogen acceptor and replication of genes</li> </ul>	Milk, eggs, cheese, meat, fish, poultry, brewer's yeas
<b>Biotin</b>	<ul style="list-style-type: none"> <li>• Synthesis of fatty acids.</li> <li>• Protein metabolism.</li> <li>• Utilization of glucose</li> </ul>	Liver, kidneys, dark green vegetables, egg yolk, green beans, brewer's yeast, milk,
		poultry, saltwater fish, whole grains
<b>Vitamin C (ascorbic acid)</b>	<ul style="list-style-type: none"> <li>• Formation of RBCs.</li> <li>• Production of collagen (capillary wall integrity) enzyme.</li> <li>• Metabolism of amino acids.</li> <li>• Prevention of oxidation of vitamins</li> </ul>	Citrus fruits, strawberries, cantaloupe, fresh vegetables: potatoes, cabbage, tomatoes, broccoli, green peppers



<b>Folic acid (pteroylglutamic acid)</b>	<ul style="list-style-type: none"> <li>• Synthesis of purines and thymine (DNA formation).</li> <li>• Maturation of RBCs.</li> <li>• Functions as coenzyme in DNA and RNA synthesis</li> </ul>	Liver, green leafy vegetables, meat, fish, poultry, whole grains, barley, bran, brewer's yeast, brown rice
<b>Niacin (nicotinic acid)</b>	<ul style="list-style-type: none"> <li>• Coenzyme in energy metabolism</li> </ul>	Meats, dairy products, whole grains, cereals, tuna, broccoli, carrots, cheese, corn flour
<b>Pantothenic acid</b>	<ul style="list-style-type: none"> <li>• Metabolism of carbohydrates and fats.</li> </ul>	Meats, whole grain cereals, legumes

### Vitamin toxicity

- Fat-soluble vitamins: A, D, E, and K —are stored in the body for long periods of time, and pose a greater risk for toxicity than water-soluble vitamins. Fat-soluble vitamins are only needed in small amounts.
- Beta carotene is an important antioxidant that the body converts to Vitamin A, and it is found in a variety of fruits and vegetables.
- Inadequate dietary consumption of vitamin D, along with limited sun exposure, makes vitamin D deficiency a growing public health concern.
- Vitamin E benefits the body by acting as an antioxidant, and research indicates that it may offer a protective effect if obtained through a diet rich in fruits and vegetables, as opposed to a supplement or multivitamin.
- The bacteria in our gut produce vitamin K, and it is also found in green leafy vegetables.



symptoms of vitamin A toxicity include dry, itchy skin, headache, nausea, and loss of appetite. Signs of severe overuse over a short period of time include dizziness, blurred vision and slowed growth. Vitamin A toxicity can also cause severe birth defects and may increase the risk for bone loss and hip fractures.

Signs of vitamin D toxicity include excess calcium in the blood, slowed mental and physical growth, decreased appetite, nausea and vomiting.

Megadose of supplemental vitamin E may pose a hazard to people taking blood-thinning medications such as Coumadin (also known as warfarin) and those on statin drugs.

People taking blood-thinning drugs or anticoagulants should moderate their intake of foods with vitamin K, because excess vitamin K can alter blood clotting times. Large doses of vitamin K are not advised.



### Recommended Dietary Intake (RDA) and Adequate Intake (AI) for Fat-Soluble Vitamins

Life Stage Group	Vitamin A (mcg <sup>1</sup> /RAE)	Vitamin D (mcg <sup>2</sup> )	Vitamin E (mcg a-TE <sup>3</sup> )	Vitamin K (mcg)
<b>Infants<sup>4</sup></b>				
0 – 6mo	400*	10*	4*	2.0*
6mo – 12mo	500*	10*	5*	2.5*
<b>Children</b>				
1 – 3y	300	15	6	30*
4 – 8y	400	15	7	55*
<b>Males</b>				
9 – 13y	600	15	11	60*
14 – 18y	900	15	15	75*
19 – 30y	900	15	15	120*
31 – 50y	900	15	15	120*
51 – 70y	900	15	15	120*
>70y	900	20	15	120*
<b>Females</b>				
9 – 13y	600	15	11	60*
14 – 18y	700	15	15	75*
19 – 30y	700	15	15	90*
31 – 50y	700	15	15	90*
51 – 70y	700	15	15	90*
>70y	700	20	15	90*
<b>Pregnant</b>				



14 – 18y	750	15	15	75
19 – 30y	770	15	15	90
31 – 50y	770	15	15	90
Lactation				
14 – 18y	1200	15	19	75
19 – 50y	1300	15	19	90





## الوحدة السابعة - المحاضرة الأولى - الزمن: 120 دقيقة

### أهداف المحاضرة الأولى:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على:

1. Define Electrolytes and minerals
2. discuss the functions and metabolism of minerals.
3. Identify the main sources for each Mineral.
4. Describe the daily requirements for each mineral.

### موضوعات المحاضرة الأولى:

Minerals

- . Major Minarls.

### الأساليب والأنشطة والوسائل التعليمية

الوسائل التدريسية	الأساليب والأنشطة التدريسية	م
<ul style="list-style-type: none"><li>• جهاز حاسوب</li><li>• جهاز عرض</li><li>• سبورة</li><li>• اوراق واقلام</li></ul>	<ul style="list-style-type: none"><li>• نشاط الترحيب بالطلبة (1/1/7)</li><li>• محاضرة</li><li>• مناقشة</li><li>• سؤال وجواب</li></ul>	1



## خطة إجراءات تنفيذ المحاضرة الاولى

الزمن بالدقيقة	الإجراءات	المحاضرة	الوحدة
120 دقيقة	الترحيب بالطلبة والتعارف معهم التعريف بالبرنامج وأهدافه وأهميته القاء المحاضره	الأولى	السابعة

## المادة العلمية

### Minerals

### Electrolytes

- Electrolytes are small, inorganic substances (either single mineral elements or small compounds) that can dissociate or break apart in solution and carry an electrical charge.



- These charged particles are called ions .

**In any chemical solution , separate particles are constantly in balance between anions and Cations to maintain electrical neutrality**

**Cations are ions carrying a positive charge , e.g.,**

- Sodium [  $\text{Na}^+$  ] .
- Potassium [  $\text{K}^+$  ] .
- Calcium [  $\text{Ca}^{2+}$  ] , and
- Magnesium [  $\text{Mg}^{2+}$  ]

### **Anions**

**Anions are ions carrying a negative charge e. g. ,**

- Chloride [  $\text{Cl}^-$  ] .
- Bicarbonate [  $\text{HCO}_3^-$  ] .
- Phosphate [  $\text{PO}_4^{3-}$  ] , and,
- Sulfate [  $\text{SO}_4^{2-}$  ] .
- Electrolytes can freely diffuse across most membranes of the body , thereby maintaining a constant balance between the intracellular and extracellular electrical charge .



## Minerals

- Minerals (inorganic elements) serve as catalysts in biochemical reactions.
- They are classified according to their daily requirement  
(microminerals, and microminerals)
- major macro minerals required by the body are:
  1. Calcium.
  2. Phosphorous.
  3. Magnesium.

Microminerals such as copper, fluoride, iodine, iron, selenium, and zinc

- play essential roles in metabolism.
- Calcium and phosphorus make up 80 % of all mineral elements in the body.
- Minerals are inorganic elements that originate from rocks within the earth's crust.
- Unlike organic substances in the body , minerals do not break



down during metabolism , though they can combine with other compounds as they are incorporated into the body , for example , iron becomes part of hemoglobin in the red blood cell and zinc is incorporated into metabolic enzymes.

### Functions of Mineral

1. Providing structure in the form of bones , teeth , and soft tissue ( Example ,Calcium , Phosphorus , Fluoride ) .
2. Exerting osmotic pressure to maintain fluid balance ( Example , sodium ,potassium ) .
3. Assisting in acid- base balance of fluids ( phosphorus ) .
4. Serving as cofactors and coenzymes for metabolic and hormonal reactions (iodine ,zinc , selenium , copper ) . Playing a role in crucial nerve transmission and muscle contraction . ( e.g. , Sodium , potassium , magnesium , calcium )

### Categories of minerals.



1. **Macro minerals** are those that people require daily in amounts over 100 mg. They include calcium, phosphorus, sodium, potassium, magnesium, chloride, and Sulphur.
2. **Microminerals** are those that people require daily in amounts less than 100 mg. They include iron, zinc, manganese, iodine, fluoride, copper, cobalt, chromium, and selenium. Common problems associated with the mineral nutrients are iron deficiency resulting in anemia, and osteoporosis resulting from loss of bone calcium.

### Major minerals

1. Calcium

#### Functions

- a. Structural component of bones and teeth .
- b. Nerve impulse conduction .
- c. Muscle contraction



## Food Sources

Milk ,Yogurt ,Cheese ,Fish , fortified soy products , fortified juices ,green leafy vegetables .

Deficiency symptoms:- osteoporosis.

Toxicity symptoms :- Risk of kidney stones , high blood calcium calcification of soft tissues .

## Recommended intake

In adults age 19-50 years 1000 mg/day ,during adolescence when bone depositionis increased to 1300 mg/day.

## 2. Phosphorus

### Functions

- Structural component of bones .
- Synthesis of ATP phospholipids.
- Acid –Base balance



## Food Sources

protein –rich foods such as dairy , meats, poultry and legumes .

Deficiency Symptoms :- Dietary deficiency rare hypophosphatemia → anorexia ,  
muscle weakness , confusion.

Toxicity Symptoms :- Is rare with normal kidney function .

Elevated blood phosphorus → Calcification of tissues .

## Recommended intake

In adults age 19 years and older the RDA is 700 mg/day

## 3. Magnesium

function

- a- Coenzyme of metabolism, muscle and nerve action
- b- maintenance of heart rhythm, aids thyroid hormones secretion.

Food sources

Green leafy vegetables whole grains , nuts , legumes .

Deficiency Symptoms :- Low blood magnesium → neuromuscular excitability ,  
cardiac arrhythmias.





Toxicity Symptoms :- occurs with supplements only diarrhea , mental status changes , muscle weakness , arrhythmias .

Recommended intake :- in males between 19-30 years the RDA 400 mg/day increased to 420 mg/day after 30 years , in females the RDA 310 mg/day from age 19-30 years and increased to 320 mg/day after age 30 years .

#### 4. sulphur Functions

- a. Component of some amino acids (methionine and cysteine) , bile salts
- b. Synthesis of connective tissue , fibrinogen , estrogen, heparin

#### Food Sources

Drinking water , high protein food.

Deficiency Symptoms :- Is rare , growth stunting .

Toxicity Symptoms :- Acute toxicity → osmotic diarrhea.

Recommended intake :- 2.8 mg /day.



## **5. Sodium ( Major extracellular fluid control water balance )**

### **Functions**

- a. acid-base balance , muscle action.
- b. maintenance of plasma volume .
- c. Cell membrane potential and active transport of substances across cellmembranes.

### **Food Sources**

Table salt , processed and convenience foods , smoked and pickled foods.

Deficiency Symptoms :- Decreased extracellular fluid volume .

Toxicity symptoms :- altered fluid volume and potential for increased blood pressure.

Recommended Intake :- 1.5 gm /day for adults 19-50 years.

## **6. Potassium ( major intracellular fluid control )**

### **Functions**

- a. Nerve cell transmission .
- b. Muscle contraction .
- c. Fluid balance.



### Food sources

Fruits (banana , dried fruit , melon ) vegetables ( tuberous , roots and green leafy ,potato , sweat potato , carrot , spinach ) , (legumes) .

Deficiency Symptom :- cardiac arrhythmia , muscle weakness , ↑ urinary calcium ,

Deficiency Symptom :- cardiac arrhythmia , muscle weakness , ↑ urinary calcium ,  
glucose intolerance.

Toxicity symptoms :- cardiac arrhythmia. Recommended intake :- for adult 4.7 gm./ day

, Deficiency Symptom :- cardiac arrhythmia , muscle weakness , ↑ urinary calcium  
.glucose intolerance

Toxicity symptoms :- cardiac arrhythmia. Recommended intake :- for adult 4.7 gm./ day



## الوحدة السابعة - المحاضرة الثانية - الزمن: 120 دقيقة

### أهداف المحاضرة الثانية:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على:

1. Define Electrolytes and minerals
2. discuss the functions and metabolism of minerals.
3. Identify the main sources for each Mineral.
4. Describe the daily requirements for each mineral.

### موضوعات المحاضرة الثانية:

Trace minerals

### الأساليب والأنشطة والوسائل التعليمية

الوسائل التدريبية	الأساليب والأنشطة التدريبية	م
• جهاز حاسوب • جهاز عرض • سبورة • اوراق واقلام	• نشاط الترحيب بالطلبة (1/2/7) • محاضرة • مناقشة • سؤال وجواب	1



## خطة إجراءات تنفيذ المحاضرة الاولى

الزمن بالدقيقة	الإجراءات	المحاضرة	الوحدة
120 دقيقة	الترحيب بالطلبة واعادة بعض النقاط المهمة من المحاضره السابقه	الثانيه	السابعه
	التعريف بالبرنامج وأهدافه وأهميته		
	القاء المحاضره		



## المادة العلمية:

### Trace minerals

- Trace minerals are iron , iodine , zinc , selenium , copper , fluoride , chromium , molybdenum and manganese .
- These nutrients are classified as trace minerals because they are present in the body in amounts less than 5 gm. and the daily requirement is less than 100 mg

### Iron

#### Functions

- Iron is essential for oxygen transport throughout the body . Approximately two-thirds of the body's iron is part of the protein hemoglobin found in red blood cells. Hemoglobin carries oxygen from the lungs to the rest of the body .

#### Food Sources

Organ meats (liver and heart ) , legumes , green leafy vegetables.

Deficiency symptoms : Fatigue , rapid heart rate , development delays in children ,pica , koilonychias , glossitis , anemia.



Toxicity symptoms : Hemochromatosis , organ damage

### **Factors affecting iron balance**

1. Decreased iron intake .
  - a. Poor quality diet .
  - b. Inappropriate use of cow's milk in children under age 3 years .
2. Decreased iron absorption
  - A .Reduced iron bioavailability – phytates , polyphenols ( tea , coffee ) , high calcium intake , soy protein .
  - b. Alkaline gastric , medications ( anti acids and ulcer medication ) .
  - c. Hookworm .
  - d. Malabsorptive disease .

Increased losses

- a. Surgery .
- b. Menstruation .
- c. Gastrointestinal or genitourinary losses of blood.

4. Increased needs :

- a. growth



## b. pregnancy

### Recommended intake

1. The RDA for age 19 years and older is 8 mg of iron per day
2. Females of childbearing age are advised to consume 15 mg /day of iron age 14 to 18 years and then 18 mg /day until age 50 year
3. During pregnancy increased to 27-30 mg/day
4. Infants born to mothers with iron deficiency anemia are at risk for low birth weight and preterm deliver
5. Healthy, full term babies should have sufficient fetal iron stores to last until age 4 to 6 months.

### **Zinc.**

#### Function

Enzyme cofactor ( over 100 different enzyme in the body )

Food Sources : Oysters , red meat , whole grains

Deficiency symptoms : Reduced appetite and taste acuity , stunted growth , hypogonadism in boys , diarrhea , poor wound healing .





### Toxicity symptoms

1. Impaired copper absorption status .
2. reduced immune response.
3. decreased HDL cholesterol .

**Recommended intake** : The RDA of zinc for

- Adult females is 8 mg /day.
- Adult males is 11 mg/day .

### **Selenium.**

#### **Function**

1. Antioxidant .
2. plays role in cancer prevention .
3. maintenance of thyroid and immune function .

#### **Food source**

**nuts , beef , seafood , poultry , some plants .**

**Deficiency Symptoms** : Rare , Hypothyroidism

**Toxicity Symptoms** : Hair loss , garlicky breath , fatigue , intestinal complaints.



**Recommended intake :-** 55 mcg for adults.

### **Copper.**

#### **Function:**

1. coenzyme , copper is needed for the binding of iron to the transport protein transferrin .
2. It is important in collagen and connective tissue synthesis and woundhealing .

. Food Sources : Organ meats such as liver , seafood , nuts , grain products

Deficiency symptoms : Anemia , bone demineralization

toxicity symptoms : Vomiting , diarrhea , cirrhosis , liver failure

Recommended intake : The RDA for copper is 900 mcg per day for adolescents and all adults.

### **Fluoride.**

#### **Function.**

1. Mineralization of bones and teeth .
2. Fluoride provided to children up to age 8 years to 12 years



improves the mineralization of teeth .

### **Food sources**

1. Drinking water .
2. dental products such as rinses , gels and foams also supply fluoride .

Deficiency symptoms : Increased risk of dental caries

Toxicity symptoms : Fluorosis

Recommended intake : The RI for fluoride 2 mg per day for adult females and 3 mg for adult males per day.

### **Chromium.**

#### **Function.**

1. acts as a cofactor in the action of insulin in the body .
2. maintaining blood glucose homeostasis .

. Food sources : Meats poultry and fish

Deficiency symptoms : Chromium deficiency is reported to cause glucose intolerance its rare



Toxicity symptoms : None reported

Recommended intake

In adult males up to age 50 years , 35 mcg per day is recommended  
Whereas females of the same age are 25 mcg daily.

## **Iodin Functions.**

Iodine is component of thyroid hormones which are responsible for regulation of temperature , metabolic rate , and enzyme action in the body .

**Food Sources :** Sea food , iodized salt

**Deficiency symptoms :** Thyroid disease , goiter , congenital hypothyroidism .

**Toxicity symptoms :** Thyroid disease

**The recommended intake** for iodine is 150 mcg per day for adults

**Prolonged iodine deficiency** causes enlarged thyroid gland is called goiter .



## Manganese.

### Function.

1. Bone formation .
2. Metabolism of carbohydrate , protein and fat.  
Food Sources : Legumes , grains , nuts

Deficiency symptoms: slowed growth or impaired growth and glucose tolerance .

Toxicity symptoms: Neurological symptoms ( limited human data ).

The recommended intake of manganese is 2.1 mg per day for adults .



## الوحدة الثامنة - المحاضرة الاولى - الزمن: 120 دقيقة

### أهداف المحاضرة الاولى:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على:

1. Identify the functions of water.
2. Compare the various types, location, and subdivisions of body fluids.
3. Discuss the mechanisms of water balance.
4. Describe the functions of major minerals.
5. Compare between major and trace minerals.
6. Discuss the daily requirements, deficiency and toxic symptoms, and the main sources of major and trace minerals

### موضوعات المحاضرة الاولى

Water and metabolism



## الأساليب والأنشطة والوسائل التعليمية

الوسائل التدريبيه	الأساليب والأنشطة التدريبيه	م
<ul style="list-style-type: none"><li>• جهاز حاسوب</li><li>• جهاز عرض</li><li>• سبورة</li><li>• اوراق واقلام</li></ul>	<ul style="list-style-type: none"><li>• نشاط الترحيب بالطلبة (1/1/8)</li><li>• محاضرة</li><li>• مناقشة</li><li>• سؤال وجواب</li></ul>	1

## خطة إجراءات تنفيذ المحاضرة الاولى

الزمن بالدقيقة	الإجراءات	المحاضرة	الوحدة
120 دقيقة	الترحيب بالطلبة واعادة بعض النقاط المهمة من المحاضره السابقه	الاولى	الثامن
	التعريف بالبرنامج وأهدافه وأهميته		
	القاء المحاضره		

المادة العلمية:



## Water

- Water is the most abundant nutrient in the body and accounts for 60% to 70% of an adult's total body weight and 77% of an infant's weight.
- It is a major component of body fluids, secretions, and excretions.
- Body water decreases as body fat increases and with aging.
- Water and electrolytes are substances that must be acquired from the diet.
- Normally the body maintains a balance between the amount of fluid taken in and the amount excreted.
- The requirements for body water are met through the consumption of liquids and foods and the oxidation of food.
- Solid foods, especially fruits and vegetables, contain 85% to 95% water.
- The normal daily turnover of water is 4% of an adult's total body weight and 15% of an infant's total body weight.

### Function of the water

1. acts as a solvent .





2. serves as a means of transport .
3. regulates temperature control , and
4. provides lubrication for the body .

### **Requirements of body water**

The body's requirement for water varies according to several factors :

- a. environment .
  - b. activity level .
  - c. functional losses .
  - d. metabolic needs.
  - e. age and other dietary factors .
1. the average sedentary woman should consume 2.7 L of water per day .
  2. A sedentary man should consume 3.7 L of water per day .

### **Surrounding environment.**

- As the temperature rises in the surrounding environment , body water is lost as sweat in an effort to maintain body temperature .
- water intake must accommodate such losses in sweat .



### Activity level.

- more water is lost in sweat and respiration , and
- more water is necessary for the increased metabolic demand involved in physical activity .

### Functional losses.

- When any disease process interferes with the normal functioning of the body , water requirements are affected for example , such as prolonged diarrhea , large amounts of water may be lost .
- Uncontrolled diabetes mellitus causes an excess loss of water through urines as a result of high glucose levels in the blood .

### Metabolic needs.

- Body metabolism requires water .
- A general rule is that roughly 1000 ml of water is necessary for every 1000 kcal in the diet .

### Age.

- Age plays an important role in determining water needs ,



especially in infants , The average usual intake for infants age 0 to 6 months and 7 to 12 months is 700 ml and 800 ml total water per day from human milk and complementary foods , respectively.

#### **Other dietary factors.**

- Certain dietary additives and medications can affect water requirements because of their natural diuretic effect [Lasix ] .
- Other dietary factors that have long been viewed as diuretics are alcohol and caffeine .

#### **The Human water balance system.**

##### **Body water: solvent amount and distribution**

- Normal body water content ranges from 45% to 75% of the total bodyweight in adults.
- Men generally have 10% more body water than women , averaging 60% and 50% total body weight , respectively .
- Differences generally are attributable to a higher ratio of muscle



to fat mass in males .

- Muscle contains significantly more water than does adipose tissue .

### **Body water is categorized in two major compartments:**

#### **A- Extracellular fluid.**

- The total body water outside the cell is called the extracellular fluid (ECF)
- This water collectively makes up approximately 20% of the total bodyweight and 34% of total body water .
- one fourth of the ECF ( 4% to 5% of the total body weight ) is contained in the blood plasma , or intravascular , compartment .
- The remaining three fourths (15% of the total body weight ) is composed of the following:
  1. Water surrounding the cells and bathing the tissues (interstitial fluid
  2. Water within the lymphatic circulation , and
  3. Water moving through the body in various tissue secretions ( transcellular fluid ) .
- Interstitial fluid circulation helps move materials in and out of body cells .

#### **B- intracellular fluid.**

- Total body water inside cells is called the intracellular fluid ( ICF) .



- This water collectively amounts to roughly twice that outside the cells , making up approximately 40% to 45% of the total body weight and 66%of total body water.

#### **Water balance.**

- Water enters and leaves the body by various routes controlled by basicmechanisms such as thirst and hormones .
- The average adult metabolizes 2.5 to 3 L of water per day in a balance between intake and output .

#### **Water intake.**

- Water enters the body in three main forms:
  1. as preformed water in liquid that are consumed .
  2. as preformed water in foods that are eaten and .
  3. as a product of cell oxidation when nutrients are burned in the body of energy (i.e., metabolic water or " water of oxidation " )
- The average water intake through fluids of adult men and women are 3L / day ( approximately 13 cups ) and 2.2 L /day ( approximately9 cups )respectively .



### **Water output.**

- Water leaves the body through the kidneys , skin , lungs, and feces .
- the largest amount of water exits through the kidneys .
- On average , the daily water output from the body totals approximately 2600ml , which balances the average intake of water.



## الوحدة التاسعة - المحاضرة الأولى - الزمن: 120 دقيقة

### أهداف المحاضرة الأولى:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على:

1. Identify the characteristics of healthy pregnancy.
2. Describe the Wight changes during the different stages of pregnancy.
3. Principles of Nutritional therapy during Pregnancy.
4. Discuss the general dietary problems during pregnancy.
5. Describe the dietary requirement for p

### موضوعات المحاضرة الأولى:

Nutrition in pregnancy.

### الأساليب والأنشطة والوسائل التعليمية

الوسائل التدريسية	الأساليب والأنشطة التدريسية	م
<ul style="list-style-type: none"><li>• جهاز حاسوب</li><li>• جهاز عرض</li><li>• سبورة</li><li>• اوراق واقلام</li></ul>	<ul style="list-style-type: none"><li>• نشاط الترحيب بالطلبة (1/1/9)</li><li>• محاضرة</li><li>• مناقشة</li><li>• سؤال وجواب</li></ul>	<b>1</b>



## خطة إجراءات تنفيذ المحاضرة الاولى

الزمن بالدقيقة	الإجراءات	المحاضرة	الوحدة
120 دقيقة	الترحيب بالطلبة واعادة بعض النقاط المهمة من المحاضره السابقه	الأولى	التاسعه
	التعريف بالبرنامج وأهدافه وأهميته		
	اللقاء المحاضره		

### المادة العلمية:

#### Healthy pregnancy.

- A healthy pregnancy has often been defined by the birth weight of the newborn , because infant mortality , or death , is low for infants with birth weights of 3500 to 4500 gm.
- The two key factors that predict infant birth weight are:
  1. maternal preconception weight and ,
  2. weight gain during pregnancy .
- Nutrition and other lifestyle factors affect maternal weight and weight gain , many of these factors, particularly nutrition, are





modifiable or may be controlled by the pregnant woman.

### **Weight gain in pregnancy.**

- The basal metabolic rate (BMR) rises during pregnancy by as much as 15% to 20% by term.
- This increase is caused by the increased oxygen needs of the fetus and the maternal support tissues .
- There are alterations in maternal metabolism of protein, carbohydrate and fat.
- There are three components for maternal weight gain.
  1. Maternal body composition changes including increased blood and extracellular fluid volume.
  2. The maternal support tissues such as the increased size of the uterus and breasts
  3. The products of conception, including the fetus and the placenta.
- Poor weight gain by the mother during pregnancy may then lead to growth retardation in the infant .
- Infant born small for gestational age (SGA) or low birth weight are more likely to require prolonged hospitalization after birth or be ill or die during the first year of life .



**Low birth weight** : weight less than ( 2500 gm ) at birth

### **Nutritional demands of pregnancy.**

Pregnancy is associated with increased nutritional needs due to the physiologic changes of the woman and the metabolic demands of the embryo/fetus.

In fact, energy requirements increase by an estimated 300 kcal/day during pregnancy and 500 kcal/day during lactation.

### **Micronutrient needs during pregnancy**

Micronutrient	RDA
Biotin	30 mcg/day (AI)
Folic Acid	600 mcg/day
Niacin	18 mg/day
Pantothenic Acid	6 mg/day (AI)
Riboflavin	1.4 mg/day



Thiamin	1.4 mg/day
Vitamin A	750 mcg (2,500 IU)/day
Vitamin B <sub>6</sub>	1.9 mg/day

Vitamin B <sub>12</sub>	2.6 mcg/day
Vitamin C	80 mg/day
Vitamin D	15 mcg (600 IU)/day
Vitamin E	15 mg (22.5 IU)/day
Vitamin K	75 mcg/day
Calcium	1,300 mg/day
Chromium	29 mcg/day
Copper	1 mg/day
Fluoride	3 mg/day



Iodine	220 mcg/day
Iron	27 mg/day
Magnesium	400 mg/day
Manganese	2 mg/day
Molybdenum	50 mcg/day
Phosphorus	1,250 mg/day
Potassium	4,700 mg/day
Selenium	60 mcg/day
Sodium	1,500 mg/day
Zinc	12 mg/day
Choline	450 mg/day

## Principles of nutritional therapy during pregnancy

1. Prevention of the weight extremes , underweight or obesity .



2. Correction of any dietary deficiencies and maintenance of optimal nutritional status during pregnancy
3. Management of any related coexisting disease such as diabetes mellitus or hyperlipidemia

### **Energy needs**

- The DRI standard recommends an additional amount of energy of approximately 340 kcal /day during the second trimester and,
- 450 kcal/day during the third trimester of pregnancy to supply needs during this time of rapid growth.

The calories must be enough to:

1. Supply the increased energy and nutrient demands created by the increased metabolic workload, including some maternal fat storage and fetal fat storage to insure an optimal newborn size for survival.
2. Spare protein for tissue building.

### **Protein, Fat, And carbohydrate need.**

- The total amount of protein recommended for a pregnant woman is 71gm./day .
- an increase of 25 gm./day based on the woman non pregnant.



- More protein is necessary for demands posed by the following :-
  1. Rapid fetal growth
  2. Enlargement of the uterus , mammary glands, and placenta
  3. Increase in maternal circulating blood volume and for increased plasma proteins to maintain colloidal osmotic pressure and circulation of tissue fluids.
  4. Formation of amniotic fluid.
  5. Storage reserves for labor, delivery and lactation
- Carbohydrate intake at least 175 g/ day during pregnancy is important for an adequate supply of glucose and non-protein energy .
- Whole grain breads and cereals and fresh fruits and vegetables should be consumed to meet maternal and fetal glucose needs, as well as provide fiber for satiety and bowel regulation .
- In general, total daily dietary k-calorie intake should comprise 15% protein ,30% fat and 55% carbohydrate.

### **Mineral needs.**



All the major and trace minerals play roles in maternal health . Four that have special functions in relation to pregnancy , calcium , iodine , iron and zinc.

Mineral	Daily requirement	importance
<b>Calcium</b>	1000 mg of calcium per day	<ul style="list-style-type: none"> <li>• construction and maintenance of bone and teeth.</li> <li>• important factor in the blood-clotting mechanism.</li> <li>• used in normal muscle action</li> </ul>

<b>Iodine</b>	increase by 70 mg/day during pregnancy	<ul style="list-style-type: none"> <li>• Iodine is vital for thyroid hormone synthesis and prevention of goiter.</li> <li>• support changes in maternal thyroid economy.</li> <li>• increased maternal renal clearance</li> </ul>
<b>Iron</b>	27 mg of iron per day	
<b>Zinc</b>		



### Vitamin needs

Vitamin	Daily requirement	importance
<b>Vitamin A</b>	770 µg	<ul style="list-style-type: none"><li>• Vitamin A is an essential factor in cell differentiation , organ formation.</li><li>• maintenance of strong epithelial tissue.</li><li>• tooth formation and normal bone growth</li></ul>
<b>Vitamin C</b>	85 mg/day	<ul style="list-style-type: none"><li>• Vitamin C is essential to the formation of intercellular cement substance in developing connective tissues and vascular systems .</li><li>• It also increases absorption of iron , which is needed for the increasing quantities of hemoglobin</li></ul>
<b>Vitamin D</b>	5µg cholecalciferol (200 IU/day )	vitamin D is used to promote the absorption and utilization for these minerals





## General dietary problems

### 1. Nausea and vomiting

- Symptoms of nausea and vomiting are usually mild and short term , is called" morning sickness " of early pregnancy.
- At least 50% of all pregnant women , most of them in their first pregnancy , experience this condition , beginning during the fifth or sixth week of the pregnancy and usually ending about the fourteenth to sixteenth week .
- This problems occur because some physiologic factors and hormonal changes in pregnancy or on low blood sugar which can be relieved by carbohydrate foods, but which will return within 2 to 3 hours after a meal .
- **Hyperemesis:** Severe vomiting during pregnancy , this persistent condition causes severe alterations in fluids and electrolytes, weight loss , and nutritional deficits , sometimes requiring hospitalization and alternative feeding by enteral parenteral methods to sustain the pregnancy . about 3.5 : 1000 occur in pregnant women.



## **2. Constipation**

- Placental hormones relax the gastrointestinal muscles , and the pressure of the enlarging uterus on the lower portion of the intestine may make elimination somewhat difficult .
- Increased fluid intake and the use of naturally laxative foods containing dietary fiber , such whole grains , fruits and vegetables fruits and juices.
- Laxatives should be avoided .
- Appropriate daily exercise is essential for overall health during pregnancy .

## **3. Heartburn or Gastric pressure :-**

- These discomforts occur especially after meals and are usually caused by the pressure of the enlarging uterus crowding the stomach .
- Gastric reflux of some of the food mass, now a liquid chyme mixed with stomach acid , causing an irritation and a burning sensation .
- Small meals, avoiding eating large meals at any time , and not



lying down after a meal .

### Effects of iron supplements

- The effect of iron supplement may include gray or black stools and sometimes nausea , constipation , or diarrhea .
- The iron supplement should be taken 1 hour before a meal or 2 hours after with liquid such as water or orange juice but not with milk or tea .
- The absorption of iron is increased with vitamin C and decreased with milk , other dairy foods , eggs , whole grain bread and cereal , and tea.



## الوحدة التاسعة - المحاضرة الثانية - الزمن: 120 دقيقة

### أهداف المحاضرة الثانية:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على:

1. Discuss the general dietary problems during lactation.
2. Describe the dietary requirement for lactating women.
3. discusses the concepts related to natural and artificial feeding

### موضوعات المحاضرة الاولى:

1. Nutrition in lactation.
2. Factors affecting milk secretion.
3. Advantages of brest feeding.

### الأساليب والأنشطة والوسائل التعليمية

الوسائل التدريبية	الأساليب والأنشطة التدريبية	م
• جهاز حاسوب • جهاز عرض • سبورة • اوراق واقلام	• نشاط الترحيب بالطلبة (1/2/9) • محاضرة • مناقشة • سؤال وجواب	1



## خطة إجراءات تنفيذ المحاضرة الاولى

الزمن بالدقيقة	الإجراءات	المحاضرة	الوحدة
120 دقيقة	الترحيب بالطلبة واعادة بعض النقاط المهمة من المحاضره اسابقه	الثانيه	التاسعه
	التعريف بالبرنامج وأهدافه وأهميته		
	القاء المحاضره		

## المادة العلمية

### Nutrition during lactation

#### Nutritional needs

The physiologic needs of lactation are different from those of pregnancy, and they demand adequate nutritional support.

#### Energy

- The recommended caloric increase is 330 kcal/day ( plus 170kcal /day from maternal stores ) in the first 6 months and 400 kcal /day in the second 6 months of breastfeeding .



- This makes a daily total of about 2700 to 2800 kcal , this additional energy need for the overall total lactation process is based on the following four factors :

**1. Milk content** :as average daily milk production for lactating women is 780 ml .

The energy content of human milk averages 0.67 to 0.74 kcal/g .Thus 780 ml of milk has a value of about 525 kcal .

## Milk production 2

- The metabolic work involved in producing this amount of milk is about 80% efficient and requires from 400 to 450 kcal .
- During pregnancy the breast is developed for this purpose , stimulated by hormones from the placenta .
- After birth the mother's production of the hormone prolactin continues this milk production process .
- The suckling infant stimulates the brain's release of the hormone oxytocin from the pituitary gland to initiate the letdown reflex for the release of the milk from storage cells to travel down to the nipple.



### 3. Maternal adipose tissue and storage.

- A component of the energy need for lactation ( 170 kcal/day in the first 6 months , is drawn from maternal adipose tissue stores deposited during pregnancy in normal preparation for lactation to follow in the maternal cycle .
- additional energy input may be needed in the lactating woman's daily diet.

**4. exercise** In some women , the weight gain during pregnancy , some overweight women who are breastfeeding have a weight loss program , this weight loss of around 0.5 kg/week from 4 to 14 weeks did not affect infant growth during lactation

### Protein

The recommendation for protein needs during lactation is 71g/day during both the first 6 months and second 6 months.



### minerals

The DRI standard for calcium during lactation is 1000 mg/day.

### **Vitamins**

The DRI standard for vitamin C during lactation is 120 mg/day

### **Maternal Micronutrient during lactation**

<b>Micronutrient</b>	<b>Age</b>	<b>Recommended daily allowance (RDA)</b>
Biotin	14-50 years	35 mcg/day (AI)
Folic Acid	14-50 years	500 mcg/day <sup>a</sup>





Niacin	14-50 years	17 mg/day <sup>b</sup>
Pantothenic Acid	14-50 years	7 mg/day (AI)
Riboflavin	14-50 years	1.6 mg/day
Thiamin	14-50 years	1.4 mg/day
Vitamin A	14-18 years	1,200 mcg (4,000 IU)/day
Vitamin B <sub>6</sub>	14-50 years	2.0 mg/day
Vitamin B <sub>12</sub>	14-50 years	2.8 mcg/day
Vitamin C	14-18 years	115 mg/day
Vitamin D	14-50 years	15 mcg (600 IU)/day
Vitamin E	14-50 years	19 mg (28.5 IU)/day <sup>d</sup>
Vitamin K	14-18 years	75 mcg/day (AI)
Calcium	14-18 years	1,300 mg/day
Chromium	14-18 years	44 mcg/day (AI)



Copper	14-50 years	1.3 mg/day
Fluoride	14-50 years	3 mg/day (AI)
Iodine	14-50 years	290 mcg/day
Iron	14-18 years	10 mg/day
Magnesium	14-18 years	360 mg/day
Manganese	14-50 years	2.6 mg/day (AI)

Molybdenum	14-50 years	50 mcg/day
Phosphorus	14-18 years	1,250 mg/day
Potassium	14-50 years	5,100 mg/day (AI)
Selenium	14-50 years	70 mcg/day
Sodium	14-50 years	1,500 mg/day (AI)
Zinc	14-18 years	13 mg/day
Choline	14-50 years	550 mg/day (AI)



## **Infant nutrition.**

### **Breast feeding.**

- Human milk is the ideal first food for infants and is the primary recommendation of pediatricians and nutritionists .
- Human milk is the ideal first food for infants and is the primary recommendation of pediatricians and nutritionists .
- Nutrients in human milk are uniquely adapted to meet the growth needs of infants and are in forms more easily digested , absorbed ,and used.
- Breastfeeding supports early immunity for the baby , helps the mothers uterus quickly return to normal size .
- The ideal food for the first 4 to 6 months of life for the infants is breast milk , which has the correct balance of all the essential nutrients as well as immunologic factors that protect the infant from acute and chronic diseases
- The breast should be offered at least 10 to 12 times per 24 hours



in the first several weeks , the infant should stay on the breast , between 10 to 15 minutes per breast , is a good recommendation .

- During pregnancy the breasts prepare for lactation and , toward term ,produce colostrum .

### **Colostrum.**

- A thin , yellow fluid first secreted by the mammary gland a few days after childbirth, preceding the mature breast milk .
- It contains up to 20% protein , including a large amount of lactalbumin, more minerals ,and less lactose and fat than mature milk ,as well as immunoglobulins that represent the antibodies found in maternal blood .
- Mature breast milk comes in within the first 3 to 5 days after delivery .
- As the infant grows , breast adapts in composition to match the needs of the developing child .
- The fat content of breast milk changes from beginning to the end of the single feeding .



## Energy

- The WHO suggests that infants receive 108 kcal/kg /day for the first 6 months of the life and ,
- 98 kcal/kg/day from 6 months until the first birthday .
- Human milk is high in cholesterol and essential fatty acids which importantfor proper brain and nervous system development .

## Protein

- Protein requirement is highest during the 4 months of life when the growth isthe most rapid .
- It is suggested infants receive 2.2 g/kg/day from birth to 6 months of age and 1.6 g/kg/day for the second half of the first year .
- Increasing a normal infants protein intake above the recommended amount should be avoided because the infant kidney is immature and unable to handle the large renal solute loads of an adult .

### **Advantages of breastfeeding.**

1. Fewer infections: because the mother transfers certain antibodies



or immuneproperties in human milk .

2. Fewer allergies : cow's milk contains a number of potentially allergy-causing proteins that human milk does not have .
3. Ease of digestion : because human milk forms a softer curd in the GI tractthat is easier for the infant to digest.
4. Improved cognitive development in childhood .
5. Decreases in the risk of childhood obesity and heart disease .

### **Benefits of breastfeeding for mother**

1. Promotes faster shrinking of the uterus .
2. Reduces postpartum bleeding .
3. Decreases risk of breast and ovarian cancer .
4. Strengthens bond with the infant .
5. Enhances self-esteem in the maternal role .
6. Eliminates the need for preparing and mixing formula .
7. Saves money not spent on formula .



## **Bottle feeding**

- If a mother chooses not to breast feed , or some condition in either the mother or baby prevents it , bottle feeding of an appropriate formula is an acceptable alternative .
- Sterile procedures in formula preparation , the amount of formula consumed , and weaning from the bottle are some aspects that must be addressed to ensure the health of the child .

Choosing a formula : Most mothers who bottle feed their infants use a standard commercial formula . In some cases of milk allergy or intolerance , a soy – based formula is used .

## **Preparing the formula:**

1. Whether preparing a single bottle for each feeding or a day's batch , scrub , rinse ,and sterilize all equipment.
2. With any commercial formula , the manufactures instructions for mixing concentrated or powdered formula with water should be precisely and consistently followed .



### Feeding the formula

- Babies usually drink formula either cold or warm ; they simply want it to be consistent .
- Tilting the bottle to keep the nipple full of milk can prevent air swallowing ,and,
- the baby's head should be slightly elevated during feeding to facilitate the passage of milk into the stomach .

### Cleaning bottles and nipples

- Rinse bottles and nipples after each feeding with special bottle and nipple brushes , forcing water through nipple holes to prevent milk from crusting in them .

### Weaning time

Weaning : to accustom a young child gradually to food other than the mother's milk or a bottle - fed substitute formula as the child's natural need to suckle wanes .

- By 6 to 8 months of age , as increasing amounts of other foods





are introduced , weaning from bottle feeding takes place .

- Good food habits begin early in life and continue as the child grows .
- By 8 or 9 months of age , infants should be able to eat table foods like cooked , chopped , and simply seasoned foods without needing special infant foods .
- Whole cow's milk may be introduced at the end of the first year if the infant is consuming one third of his or her kcal as a balanced mixture of solid food ,including cereals , vegetables , fruits , and other foods , to supply adequate sources of vitamin C and iron .
- Foods with a high risk for choking and aspiration ,such as nuts , grapes , carrots , popcorn , cherries , peanut butter , and round candy , are best delayed for careful use only with the older child and not given to an infant .
- Throughout the first year of life , the requirements for physical growth and psychosocial development are met by human milk or formula , a variety of solid food additions ,and a loving , trusting relationship between parents and child .
- Solid food during the first year of life



<b>Age</b>	<b>Food</b>
4-5 months	iron – fortified infant cereal
5-6 months	strained fruits and vegetables strained fruits and vegetables
6-8 months	mashed or chopped fruits and vegetables juice from a cup
9-12 months	cheese , meats, egg yolk



## الوحدة التاسعة - المحاضرة الثالثة - الزمن: 120 دقيقة

### أهداف المحاضرة الثالثة:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على:

- . Describe the dietary requirement during different stages of life cycle, preschool, school age, adolescent and elderly.

### موضوعات المحاضرة الثالثة:

1. Nutrition for preschool.
2. Nutrition for school child.
3. Nutrition for adolescents.
4. Nutrition for Elderly.

### الأساليب والأنشطة والوسائل التعليمية

الوسائل التدريسية	الأساليب والأنشطة التدريسية	م
<ul style="list-style-type: none"><li>• جهاز حاسوب</li><li>• جهاز عرض</li><li>• سبورة</li><li>• اوراق واقلام</li></ul>	<ul style="list-style-type: none"><li>• نشاط الترحيب بالطلبة (1/3/9)</li><li>• محاضرة</li><li>• مناقشة</li><li>• سؤال وجواب</li></ul>	1



## خطة إجراءات تنفيذ المحاضرة الاولى

الزمن بالدقيقة	الإجراءات	المحاضرة	الوحدة
120 دقيقة	الترحيب بالطلبة واعادة بعض النقاط المهمة من المحاضره السابقه	الأولى	التاسعه
	التعريف بالبرنامج وأهدافه وأهميته		
	القاء المحاضره		

## المادة العلمية:

### Neonate to 1 Year

- The total daily nutritional requirement of the new born is about 80 to 100mL of breast milk or formula per kilogram of body weight.
- The new born infant's stomach capacity is about 90 mL, and feedings are required every 2.5 to 4 hours.

### Preschooler Nutrition



## Helpful feeding information for your preschooler

Preschool-age children (ages 3 to 5) are still developing their eating habits and need encouragement to eat healthy meals and snacks. These children are eager to learn. They will often imitate eating behaviors of adults. They need supervision at mealtime as they are still working on chewing and swallowing skills.

These are some helpful mealtime hints for preschool-age children:

- Provide regularly scheduled meals and snacks, and limit grazing.
- Discourage poor behavior at mealtime. Focus on eating, not playing at the dinner table. Turn off the TV and put away cell phones and other electronics during mealtime.
- Running or playing while eating can cause a child to choke. Have your child sit when eating.
- Keep offering a variety of foods in a variety of ways. Have the attitude that, sooner or later, your child will learn to eat almost all foods.
- Make mealtime as pleasant as possible. Don't put pressure on your child to eat. Don't force your child to "clean" their plate. This may lead to overeating, which can cause your child to gain too much weight. Some days children will eat everything, while other days they may eat very little. This is normal and usually ends up evening out over time.
- Don't let your child fill up on drinks like milk and juice during the day. This will lead to them being less hungry during meals and snacks.
- Provide an example of healthy eating habits. Preschoolers copy what they see their parents doing. If you have unhealthy eating habits, your child will not learn to eat healthy.

## Healthy food choices

The MyPlate icon is a guideline to help you and your child eat a healthy diet. MyPlate can help you and your child eat a variety of foods while encouraging the right amount of calories and fat.

The USDA and the U.S. Department of Health and Human Services have prepared food plates to help parents select foods for children.



The MyPlate icon is divided into 5 food group categories, emphasizing the nutritional intake of the following:

- **Grains.** Foods that are made from wheat, rice, oats, cornmeal, barley, or another cereal grain are grain products. Examples include whole wheat, brown rice, and oatmeal. Aim for mostly whole grains.
- **Vegetables.** Vary your vegetables. Choose a variety of colorful vegetables. These can include dark green, red, and orange vegetables, legumes (peas and beans), and starchy vegetables.
- **Fruits.** Any fruit or 100% fruit juice counts as part of the fruit group. Fruits may be fresh, canned, frozen, or dried and may be whole, cut up, or pureed. The American Academy of Pediatrics recommends no more than 4 ounces of juice per day for children 1 to 3 years of age, and 4 to 6 ounces per day for children 4 to 6 years of age.
- **Dairy.** Milk products and many foods made from milk are considered part of this food group. Focus on fat-free or low-fat products, as well as those that are high in calcium.
- **Protein.** Go lean on protein. Choose low-fat or lean meats and poultry. Vary your protein routine. Choose more fish, nuts, seeds, peas, and beans.

Oils are not a food group. But some oils, like those from some nuts, fish, and olives, have essential nutrients and should be part of the diet. Stay away from saturated fats, which are solid fats.

Encourage active play and everyday physical activity along with a healthy dietary plan.

### Nutrition and activity tips

Here are some tips to follow:

- Try to control when and where food is eaten by your children by providing regular daily meal and snack times. Include social interaction and demonstrate healthy eating behaviors.
- Include children in the choosing and preparing of foods. Teach them to make healthy choices by helping them to pick nutritious foods.
- Select foods with these nutrients when possible: calcium, magnesium, potassium, and fiber.



- Preschoolers don't need large servings of food. Offer small servings for meals and snacks. If you need guidance on serving sizes for your child, explore the MyPlate Plan on [MyPlate.gov](https://www.myplate.gov).
- Parents are encouraged to limit children's screen time to less than 1 hour daily. Instead, encourage activities that call for more movement and active play.
- Children and teens need at least 60 minutes of moderate to vigorous physical activity on most days for good health and fitness and for healthy weight during growth. Try to make activity fun and engaging rather than a chore.
- To prevent dehydration, encourage children to drink fluids regularly during physical activity and drink several glasses of water or other fluid after the physical activity is completed

To find more information about the Dietary Guidelines for Americans 2020–2025 and to determine the appropriate dietary recommendations for your child's age, sex, and physical activity level, visit the [MyPlate.gov](https://www.myplate.gov) and [2020–2025 Dietary Guidelines](https://www.dietaryguidelines.gov) sites. Please note that the MyPlate Plan is designed for people older than age 1 who don't have chronic health conditions.

### Nutrition for School-Aged Children

- Vegetables. 3-5 servings per day. ...
- Fruits. 2-4 servings per day. ...
- Whole Grains. 6-11 servings per day. ...
- Protein. 2-3 servings of 2-3 ounces of cooked lean meat, poultry, or fish per day. ...
- Dairy products. ...
- Zinc. ...
- Water. ...
- Healthy fat.

Daily calorie needs.

According to the American Heart Association, calorie needs for **girls ages 4 to 18 range from 1,200 to 1,800 per day, while boys typically require 1,400 to 2,200 per day.** These needs gradually increase from the lower end to the higher as children grow and developed



### Consider these nutrient-dense foods:

- Protein. Choose seafood, lean meat and poultry, eggs, beans, peas, soy products, and unsalted nuts and seeds.
- Fruits. Encourage your child to eat a variety of fresh, canned, frozen or dried fruits — rather than fruit juice. ...
- Vegetables. ...
- Grains. ...
- Dairy.

Factors that influence children and adolescents' food choices include but are not limited to **taste, money, peer pressure**، تأثير الاقران، **presentation, external environment, availability, media/advertising, and family.**

### Nutrition of adolescents.

#### What to eat

1. fruit and vegetables.
2. potatoes, bread, rice, pasta and other starchy carbohydrates.
3. beans, pulses, fish, eggs and other proteins.
4. dairy and alternatives.
5. oils and spreads.

#### Eating habits

Adolescents tend to **eat more meals away from home than younger children**. They are also heavily influenced by their peers. Meal convenience is important to many adolescents and they may be eating too much of the wrong types of food, like soft drinks, fast-food, or processed foods.

#### How much food teenagers need?

How much food teenagers need depends on body size and activity levels. Teenagers aged 12-13 years should aim for 2 serves of fruit; 5-5½ serves of





vegies; 3½ serves of dairy; 5-6 serves of grains; and 2½ serves of lean meats, eggs, nuts, seeds or legumes.

Teens need extra nutrients to support bone growth, hormonal changes and organ and tissue development, including the brain. Teens should eat breakfast, drink water and limit highly processed food, sugary drinks and eating out. Healthy eating habits and physical activity can help lower the risk of obesity.

### **Elderly nutrition**

Eat a wide variety of foods from the five food groups :

1. plenty of colorful vegetables, legumes/beans; fruit;
2. grain (cereal) foods, mostly wholegrain and high fiber varieties;
3. lean meats and poultry, fish,
4. eggs, tofu (made from soyabean), nuts and seeds;
5. milk, yoghurt, cheese or their alternatives, mostly reduced fat.

### **Practical tips**

1. Make Meals and Snacks Nutrient-dense. ...
2. Add Extra Calories Without Extra Volume. ...
3. Use Herbs and Spices When Preparing Foods. ...
4. Make Meals Colorful and Appealing. جذابه
5. Serve Several Small Meals and Snacks. ...
6. Do Not Fill Up on Non-nutritious Items. ...
7. Make Mealtime Enjoyable and Social. ...
8. Use Nutrition Supplements When Necessary.

### **The commonly prevalent nutrition related problems among the aged include;**

- Osteoporosis. Osteoporosis is characterized by decreasing bone mass and density.
- Obesity. Many of the elderly are obese. ...
- Anemia.



- Malnutrition.
- Constipation.
- Diabetes Mellitus.
- Cardiovascular disease.

Adults older than 70 need more **calcium and vitamin D** to help maintain bone health than they did in their younger years. To meet these needs, select calcium-rich foods and beverages and aim for three servings of low-fat or fat-free dairy products each day

## الوحدة العاشرة - المحاضرة الأولى - الزمن: 120 دقيقة

### أهداف المحاضرة الأولى:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على:

1. Define the concepts.
2. understand and discuss the role of antioxidants and phytochemicals.

### موضوعات المحاضرة الأولى:

#### Antioxidants and phytochemicals



## الأساليب والأنشطة والوسائل التعليمية

م	الأساليب والأنشطة التدريسية	الوسائل التدريسية
1	<ul style="list-style-type: none"><li>• نشاط الترحيب بالطلبة (1/1/10)</li><li>• محاضرة</li><li>• مناقشة</li><li>• سؤال وجواب</li></ul>	<ul style="list-style-type: none"><li>• جهاز حاسوب</li><li>• جهاز عرض</li><li>• سبورة</li><li>• اوراق واقلام</li></ul>

## خطة إجراءات تنفيذ المحاضرة الاولى

الوحدة	المحاضرة	الإجراءات	الزمن بالدقيقة
العاشرة	الأولى	الترحيب بالطلبة واعادة بعض النقاط المهمة من المحاضره السابقه	120دقيقة
		التعريف بالبرنامج وأهدافه وأهميته	
		اللقاء المحاضره	



## المادة العلمية:

**Antioxidants** are substances that can prevent or slow damage to cells caused by free radicals, unstable molecules that the body produces as a reaction to the environment and other pressure.

**Another word** Antioxidants are substances that may **protect your cells against free radicals**, which may play a role in heart disease, cancer and other diseases. Free radicals are molecules produced when your body breaks down food or when you're exposed to tobacco smoke or radiation.

### What foods have high antioxidants

Broccoli, spinach, carrots and potatoes are all high in antioxidants,



and so are artichokes, cabbage, asparagus, avocados, beetroot, radish, lettuce, sweet potatoes, squash قرع , pumpkin, collard greens لهانه and kale لهانه الخضره .

## Allicin

is **one of the main active compounds derived from garlic**. It may help prevent certain cancers and may help lower blood sugar, cholesterol, and blood pressure. It may help your muscles recover after a workout and protect against infections. Allicin supplements have few risks.

Allicin is a compound that may help [ease inflammation](#) and block [free radicals](#) that harm cells and tissues in your body. The compound is one of the main active components of garlic and what gives it its distinct taste and scent.

Alliin is a chemical found in fresh garlic. An enzyme called alliinase is activated when the clove is chopped or crushed. This enzyme converts alliin into allicin.

Pure allicin only remains stable in freshly crushed or cut garlic for a short time. But letting garlic sit for 10 minutes after crushing or cutting it may help boost levels.

Allicin may help guard against health issues like [heart disease](#) and cancer.

It may also protect against blood vessel damage by helping to lower your:



- Blood sugar
- [Blood pressure](#)
- [Cholesterol](#)

Some studies have also found that allicin may help your muscles recover faster after you work out. And the compound is thought to support immune health by warding off agents that cause illness, such as viruses and fungi.

Many studies have shown that the allicin in garlic may support health in various ways.

## Support Blood Vessel Health

Studies have shown that the allicin in garlic supports blood vessel health.

It may help improve blood pressure (BP) control and keep the blood vessel disease known as [atherosclerosis](#) at bay.

A review of 39 randomized controlled trials (RCTs) found that regular use of [compounds in garlic lowered people's cholesterol](#) levels by about 8%.<sup>4</sup>

It also helped lower the “bad fats” within your blood when taken for at least two months.

Tests showed that adults in the study had lower:

- Low-density lipoprotein (LDL)
- [Total cholesterol](#)

A more recent review of studies also supports these findings. The results of eight of nine reviews found a marked decrease in total cholesterol.<sup>5</sup>

compared to people who took a placebo (sugar pill). Their diastolic blood pressure (DBP, the bottom number) was almost nine points lower.<sup>6</sup>



A double-blind randomized controlled trial published in 2021 backed up these results. Adults with **nonalcoholic fatty liver disease** (NAFLD) in the study received either a placebo or two tablets with 400 milligrams (mg) of garlic daily for 15 weeks.<sup>7</sup>

It may protect from many types of cancer : breast, colon, liver, ovaries, prostate and pancreas cancers.

### **Flavonoids.**

**a group of natural substances with variable phenolic structures**, are found in fruits, vegetables, grains, bark, roots, stems, flowers, tea and wine. These natural products are well known for their beneficial effects on health and efforts are being made to isolate the ingredients so called flavonoids.

Flavonoids are now considered as an indispensable component in a variety of nutraceutical, pharmaceutical, medicinal and cosmetic applications. This is attributed to their anti-oxidative, anti-inflammatory, anti-mutagenic and anti-carcinogenic properties coupled with their capacity to modulate key cellular enzyme function. Research on flavonoids received an added impulse with the discovery of the low cardiovascular mortality rate and also prevention of CHD. Information on the working mechanisms of flavonoids is still not understood properly. However, it has widely been known for centuries that derivatives of plant origin possess a broad spectrum of biological activity. Current trends of research and development activities on flavonoids relate to isolation, identification, characterization and functions of flavonoids and finally their applications on health benefits. Molecular docking and knowledge of bioinformatics are also being used to predict potential applications and



manufacturing by industry. In the present review, attempts have been made to discuss the current trends of research and development on flavonoids, working mechanisms of flavonoids, flavonoid functions and applications, prediction of flavonoids as potential drugs in preventing chronic diseases and future research directions.

Flavonoids are an important class of natural products; widely found in fruits, vegetables and certain beverages. flavonoid compounds are products extracted from plants and they are found in several parts of the plant.

## Lutein

Lutein is **one of two major carotenoids found in the human eye** (macula and retina). It is thought to function as a light filter, protecting the eye tissues from sunlight damage. Foods rich in lutein include egg yolks, spinach, kale, corn, orange pepper, kiwi fruit, grapes, and squash.

It is a type of organic pigment called a carotenoid. It is related to [beta-carotene](#) and [vitamin A](#). Many people think of lutein as "the [eye](#) vitamin."

Lutein is commonly taken by [mouth](#) to prevent eye diseases, including [cataracts](#) and a disease that leads to [vision loss](#) in older





adults (age-related [macular degeneration](#) or AMD). Lutein is used for many other conditions, but there is no good scientific evidence to support these other uses.

Lutein supplements are available in soft-gel capsule form. They should be taken **at mealttime** because lutein is absorbed better when ingested with a small amount of fat, such as olive oil. The recommended dosage is 6 mg to 30 mg daily.

**Notice** do not take more than 20 mg per day of a lutein supplement. **Pregnant or breastfeeding women and children** should not take supplemental lutein. Keep all supplements, vitamins, and other medicines securely out of the sight and reach of children.