



# الدرس الثالث: رزق / غذا

## CHAPTER III: OUR FOODS



A.T.INAM

## CHAPTER THREE

### THE FOOD :

Allah The Almighty has created 'Human', the most superior amongst the entire creatures created on the earth. The rest entire things created on earth are meant to benefit the humen. Allah The Almighty explains in Qoran (الرحمن - 1-78) that Qoran itself is guidelines for humen; East & West, and Stars are created for directions. Sun & Moon are created for calculations and to calculate months & years. Air, Seas, Pearls, Marjan\*, Sky, Earth, Air, Tree, Chlorophyll\*\* Flowers, Cereals, Fruits, Dates, Pomegranates, Justice, Life & Death Paradise & Hell etc. etc. are created specially for the Humen.

Allah The Almighty has bestowed very special foods to humen, like; Milk & Honey(النحل-66و69), Animal's Flesh (الخل- 5,8,11), Fish's Flesh (المائدة-7), Bird's Flesh (الواقعه-21), apart from the basic source of food i.e. plants/trees & their produces. Therefore, food is the most important basic need, as per Qoranic indications.

Allah The Almighty indicates in Qoran that He provides you the best sources of your food; like plants/trees, animals, birds & fish etc. Allah The Almighty again addresses the humen; that humen are unable to provide food to The Almighty, but it is He, Who bestows you (us) food:

مَنْ مِّنْ يَّرْزُقُكُمْ مِّنَ السَّمَاوَاتِ وَالْأَرْضِ قُلِ اللَّهُ لَا ... ه (22- سبا - 24)  
وَرَزَقُ رَبِّكَ حَيْرٌ وَأَبْقَى ه وَأَمْرًا هَلْكَ بِالصَّلَاةِ وَأَصْطَبِرْ عَلَيْهِمَا لَا اسْتَيْسَكَ رِزْقَاهُمْ نَحْنُ  
نَرْزُقُكَ ط ... ه (16- طه - 132, 131) بِالَّذِي خَلَقَ الْأَرْضَ ... ه وَقَدْ رَزَقْنَاهَا ... ه (24- الحاقة)

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\*a precious stone

\*\* مَدَامَتْنِة (الرحمن - 64)

Food ... contd...

Allah The Almighty indicates in Qoran, the existence of a 'digestive system' in humen & animals body. Qoran says that Allah The Almighty bestows you food when you are hungry:

الَّذِينَ أَطْعَمَهُمْ مِنْ جُوعٍ ۖ لَا ... ه (30- مريش - 4)

وَيَرْزُقُهُ مِنْ حَيْثُ لَا يَحْتَسِبُ ۚ ه (28- الطلاق - 3) وَاللَّهُ خَيْرُ الرَّازِقِينَ ه (28- الجمعة 11)

Again, Allah The Almighty instructs the humen to feed the relatives, orphans & poors, when they are hungry.

أَوْ اطْعَمُوا فِي يَوْمٍ ذِي مَسْغَبَةٍ ۖ يَتِيمًا ذَا مَقْرَبَةٍ ۖ أَوْ مِنْكُمْ مَرْجُؤٌ ۖ (30- البلى - 16-14)

The word 'hunger' indicates that there is a system within the body which utilises the food eaten. When the food is fully consumed by the system, the humen starts feeling hunger.

Since the end product of food is blood & milk. Milk is reconsumed as a food by humen, while blood circulates within body to transport the digested food and to produce the 'energy':

وَإِنَّ لَكُمْ فِي الْأَنْعَامِ لَعِبْرَةً ۖ نُسْقِيكُمْ مِمَّا فِي بُطُونِهِمْ مِنْ بَيْنِ فَرْثٍ وَرِمٍ لَبَنًا خَالِصًا سَائِغًا لِلشَّارِبِينَ ه (14- النحل - 66)  
وَيَرْزُقُهُ مِنْ حَيْثُ لَا يَحْتَسِبُ ۚ ... ه (28- الطلاق - 3)

Allah The Almighty prohibits certain things to eat:

إِنَّمَا حَرَّمَ عَلَيْكُمُ الْمَيْتَةَ وَالدَّمَ وَلَحْمَ الْفَيْزِيرِ وَمَا أُهْلَ بِهِ لِغَيْرِ اللَّهِ ۚ ه (2- البقرة - 13)  
(14- النحل - 14)

Allah The Almighty has created basic needs like shelter & clothes:

وَاللَّهُ جَعَلَ لَكُمْ مِنْ ظُلُمَاتٍ النُّجُومَ ۚ سَرَابِيلَ تَقِيكُمُ النَّحْرَ وَسَرَابِيلَ تَقِيكُمُ بَأْسَكُمْ ۚ ه (14- النحل - 8)

The things mentioned in the above Qoranic Verse, may pollute the end product of food; like blood & milk. Thus, polluted or infected\* blood or milk may damage the humen brain & body.

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\*When harmful bacteria & other organisms exist.

## sub chapter i

### Food - A Basic Need:

Food is most important among the basic needs. Human life cannot survive without food.

Allah The Almighty reveals in Qoran that He provides foods to all the living creatures on earth by His Mercy. It means food is an important factor for the survival of life:

وَمَا مِنْ دَابَّةٍ فِي الْأَرْضِ إِلَّا عَلَى اللَّهِ رِزْقُهَا... هـ (١٢ - هود - ٦)  
 \* ثُمَّ قَتَلُوا أَوْلَادَ الَّذِينَ رَزَقَهُمُ اللَّهُ رِزْقًا حَسَنًا وَإِنَّ اللَّهَ لَكُوْخِرُ الرَّازِقِينَ هـ  
 (١٧ - الحج - ٥٨)  
 وَرَزَقْنَاهُمْ مِنَ النَّطِيبِ وَفَضَّلْنَاهُمْ عَلَى الْعَالَمِينَ هـ (٢٥ - الباقية - ١٦)

Prophet Ibrahim, who is Messenger of Allah and a super human, prayed to The Almighty Allah to provide him with fruits as 'food' for the livelihood of his people:

وَإِذْ قَالَ إِبْرَاهِيمُ رَبِّ اجْعَلْ هَذَا بَلَدًا آمِنًا وَارْزُقْ أَهْلَهُ مِنَ الثَّمَرَاتِ... هـ  
 (١ - البقرة - ١٢٦)  
 \*\* إِنَّ الَّذِينَ تَعْبُدُونَ مِن دُونِ اللَّهِ لَا يَخْلُقُونَ كُفًّا رِزْقًا مَا يَشْفُو عِنْدَ اللَّهِ الرَّزْقُ... هـ (٢٥ - عنكوت)

Jesus & Mary, who were also super human and faithful to The Almighty Allah, were eating food for survival. This Qoranic Verse also confirms that food is must for life:

مَا الْمَسِيحُ ابْنُ مَرْيَمَ إِلَّا رَسُولٌ قَدْ خَلَتْ مِن قَبْلِهِ الرُّسُلُ وَأُمُّهُ صِدِّيقَةٌ... هـ  
 كَانَ يَأْكُلُ مِنَ الطَّعَامِ... هـ (٦ - المائدة - ٧٥)

Allah The Almighty says to human in Qoran to eat all pure things which Allah The Almighty allows to eat: هـ  
 (٦ - المائدة - ٨٨) يَا أَيُّهَا الرُّسُلُ كُلُوا مِنَ الطَّيِّبَاتِ وَاعْمَلُوا صَالِحًا هـ (١٨ - المؤمنون - ٥١)

\*Allah The Almighty is the best feeder, and He guarantees the lives of those killed or died in the way of Allah.

\*\*Allah The Almighty is the real creator, and it is only He, Who bestow food to His creatures.

Food - A Basic Need ... contd...

Jesus, son of Mary and Messenger of The Almighty Allah, once prayed to The Almighty to provide him a special dish of food from sky, as a symbol of gift from The Almighty Allah. The day of the receipt of 'dish' will be a day of festival for us. Again, Prophet Jesus, prays that O' The Almighty Allah, bestow us source of livelihood i.e. food and Allah The Almighty is the best 'bestower':

قَالَ عِيسَى ابْنُ مَرْيَمَ اللَّهُمَّ رَبَّنَا أَنْزِلْ عَلَيْنَا مَائِدَةً مِنَ السَّمَاءِ تَكُونُ لَنَا عَيْدًا  
لأَوَّلِنَا وَآخِرِنَا وَآيَةً مِنْكَ وَارْزُقْنَا وَأَنْتَ خَيْرُ الرَّازِقِينَ ٥ (7- المائدة- 114)  
اللَّهُ الَّذِي خَلَقَكُمْ ثُمَّ رَزَقَكُمْ... ٥ (21- الروم- 40)

Allah The Almighty dislikes those, who legalise or illegalise the sources of foods, bestowed to them by The Almighty Allah:

قُلْ أَرَأَيْتُمْ مَا أَنْزَلَ اللَّهُ لَكُمْ مِنْ رِزْقٍ فَجَعَلْتُمْ مِنْهُ حَرَامًا وَحَلَالًا ۖ ٥ (١١- يونس- 59)  
وَرَزَقْنَاهُمْ مِنْ أَنْبَاطٍ وَفَضَّلْنَاهُمْ عَلَى كَثِيرٍ مِمَّنْ خَلَقْنَا تَفْضِيلًا ٥ (١5- بنى إسرائيل- 70)  
Worship The Almighty Allah, and remember that non other than Allah

• The Almighty provides you sources of your foods from sky and earth:

وَيَعْبُدُونَ مِنْ دُونِ اللَّهِ مَا لَا يَمْلِكُ لَكُمْ رِزْقًا مِنَ السَّمٰوٰتِ وَالْأَرْضِ شَيْئًا وَلَا  
يَسْتَطِيعُونَ ٥ (١٤- النحل- 73) أَتَى اللَّهُ الْبَشَرَ الْبَرِّزْقِ بِشَاءٍ وَيَقْدِرُ ٥ (29- الزمر- 52)

Allah The Almighty addresses to the sons of Adam to; i) purify yourself and be well dressed while going to mosque for worship, ii) eat and drink, which Allah The Almighty allows and do not exceed the limit, Allah The Almighty dislikes those, who cross the line of demarcation in consuming the resources, described by Allah The Almighty & iii) Allah The Almighty dislikes them, who illegalise the legalised food & dress from The Almighty:

يٰٓأَيُّهَا آدَمُ خُذْ زِينَتَكَ عِنْدَ كُلِّ مَسْجِدٍ وَكُلُوا وَشَرِبُوا وَلَا تُسْرِفُوا ۚ إِنَّهُ لَا يُحِبُّ  
الْمُسْرِفِينَ ٥ قُلْ مَنْ حَرَّمَ زِينَةَ اللَّهِ الَّتِي أَخْرَجَ لِعِبَادِهِ ۖ وَالطَّيِّبَاتُ مِنَ الرِّزْقِ ۗ ٥ (8- الاعراف- 31, 32)

Food - A Basic Need ... contd...

Allah The Almighty arranges the sources for your food from sky & earth i.e. water from sky & earth which causes germination, and sun & gases from sky and minerals from earth help during the process of food synthesis:

وَمَنْ يَرْزُقْكُمْ مِنَ السَّمَاءِ وَالْأَرْضِ ۖ ... ه (20- الخل - 64)  
هُوَ الَّذِي يُرِيكُمْ آيَاتِهِ وَيُنَزِّلُ لَكُمْ مِنَ السَّمَاءِ رِزْقًا ۖ ... ه (24- المؤمن - 13)  
وَلَقَدْ مَكَّنَّاكُمْ فِي الْأَرْضِ وَجَعَلْنَا لَكُمْ فِيهَا مَعَايِشَ ۗ ... ه (81- عرات - 10)

Food will also be provided in the paradise in the form of Dates and Pomegranate: \*  
قَالُوا هَٰذَا الَّذِي رُزِقْنَا مِنْ قَبْلُ وَأَلْزَأْتُمْهُ مُتَشَابِهًا ۖ ... ه (البقرة 25)  
فِيهِمَا نَخِيلٌ وَمِنْهَا زُرْمًا ۖ ه (27- الرحمن - 68)

Allah The Almighty provides you (human) the basic needs for your livelihood; for example i) Children: are signs that human reproduce, ii) Water Streams: help you in your day to day use, like farming, cooking, drinking & cleaning etc. and iii) Gardens: to obtain food and wood as fuel & building materials and iv) Cattles: to obtain food like; flesh & milk, fertiliser, leather and mode of transport:

أَمْ لَكُمْ بِالْأَنْعَامِ ۖ وَبَيْنَ يَدَيْكُمْ جَنَّتٌ وَ عُيُونٌ ۖ ه (19- الشعراء - 34, 133)  
وَقَالُوا لَنْ نَجُوزَ لَهَا مِنَ الْأَرْضِ يَتَّبِعُونَهَا ۖ ه (15- بني اسرائيل - 90)

Allah The Almighty again describes here some of the basic requirements for the livelihood of human, like farming, gardens, dates, streams (sources of food) and shelter:

أَشْرَكُونَ فِي مَا هُمْ بِمُتَعَمِّلِينَ ۖ ه (19- الشعراء - 146-149)  
رَخِشْتُمْ مِنَ الْجِبَالِ بُيُوتًا مَرِئِينَ ۖ ه (19- الشعراء - 146-149)  
كَمْ تَرَكُوا مِنْ جَنَّتٍ وَ عُيُونٍ ۖ ه وَ زُرْعٍ وَ مَقَامٍ كَرِيمٍ ۖ ه وَ نَعْمَةٍ كَانُوا فِيهَا  
مُلْسِينَ ۖ ه (25- الدخان - 27-25) اللَّهُ يُطِيعُ بِعِبَادِهِ يَرْزُقُ مَنْ يَشَاءُ ۖ ه (21- الشورى - 19)

\*food/fruits provided in paradise will resemble with the fruits/food bestowed by Almighty Allah in this mortal world.

Food - A Basic Need ... contd...

Allah The Almighty justifies His decision to provide us the 'Basic Requirements' on the earth and distributes accordingly amongst the people. For this Allah The Almighty rains water from the sky:

وَلَوْ بَسَطَ اللَّهُ الرِّزْقَ لِعِبَادِهِ لَبَغَوْا فِي الْأَرْضِ وَلَئِنْ يُنْزِلُ بِقَتَرٍ مَّا يَشَاءُ مِنْ مَّاءٍ لَيَبْغَادَنَّ مِنْ حَيْثُ بَصِيرَتُهُ وَهُوَ الَّذِي يُنْزِلُ الْغَيْثَ مِنْ بَعْدِ مَا سَطَّوْا وَيَنْشُرُ رَحْمَتَهُ ۖ وَرَزَقَكُم مِّنَ الطَّيِّبَاتِ ذَٰلِكُمُ اللَّهُ رَبُّكُمُ ۝ (24-1 المؤمن - 64)  
(25 - البقرة - 27, 28)

It is depend upon the Almighty Allah's will that He bestows a person the basic requirements in excess and in least quantity to the other one:

اللَّهُ يَبْسُطُ الرِّزْقَ لِمَن يَشَاءُ مِنْ عِبَادِهِ وَيَقْدِرُ لَهُ ۖ إِنَّ اللَّهَ بِكُلِّ شَيْءٍ عَلِيمٌ ۝ (21 - النمل - 62)  
أَذَلَّهُ يَرَوْنَ أَنَّ اللَّهَ يَبْسُطُ الرِّزْقَ لِمَن يَشَاءُ وَيَقْدِرُ ۖ ۝ (21 - الروم - 37)  
لَهُ مَقَالِيدُ السَّمُوتِ وَالْأَرْضِ يَبْسُطُ الرِّزْقَ لِمَن يَشَاءُ وَيَقْدِرُ ۚ إِنَّهُ بِكُلِّ شَيْءٍ عَلِيمٌ ۝ (25 - الشورى - 12)

Qoran reveals that no one other than Almighty Allah is capable to bestow us food & other requirements:

مَا أُرِيدُ مِنْكُمْ مِنْ رِّزْقٍ وَمَا أُرِيدُ أَنْ يُطْعَمُوا ۖ إِنَّ اللَّهَ هُوَ الرَّزَّاقُ ذُو الْقُوَّةِ الْمَتِينُ ۝ (27 - الذرير - 57, 58)

Allah The Almighty will provide the inhabitants of the Paradise, the basic needs like fruits, water & shelter:

فِي سِدْرٍ مَّخْضُودٍ ۖ وَطَلْحٍ مَّنْضُودٍ ۖ وَقُلُوبِ مَمْدُودَةٍ ۖ وَمَاءٍ مَّسْكُوبٍ ۖ وَفَاكِهَةٍ كَثِيرَةٍ ۖ (27 - الواقعة - 32-28)  
وَلَهُمْ رِزْقُهُمْ فِيهَا بُكْرَةً وَعَتِيًّا ۚ ۝ (29 - النحل - 62)  
(16 - مريم - 62)

Undoubtedly, the sweet & fresh water, which Allah The Almighty rains from the sky, which we drink to quench our thirst, is a part of our basic requirement. When Allah The Almighty wills, the sweet water turns to salty:

وَجَعَلْنَا بَيْنَهُمُ الرِّسَالِ شِمَاطًا ۖ وَاسْقَيْنَهُمْ كَمَالًا ۖ (29 - المائدة - 27)

Food - A Basic Need ... contd..

Allah The Almighty rewards with gardens & well of sweet water to those who are faithful and fear The Almighty;

إِنَّ الْمُتَّقِينَ فِي ظِلِّ وَعُيُونٍ ۖ وَقَوَائِعَ مِمَّا يَشْتَهُونَ ۖ طُورًا وَشُرْبًا هَنِيئًا ۝ (29-المرسلات 43-41)

إِنَّ لِلْمُتَّقِينَ مَفَازًا لَا حَبَ آيِقٍ ۖ وَاعْتَابًا ۖ (30-النبا 32, 31)  
 (15-نوح اسراءيل) ۖ وَقَالُوا لَنْ نُوْثِقَ لَكَ ۚ هَٰذَا نَفْعُنَا مِنَ الْآرِثِ بِبُوعُنَا ۖ أَرَأَيْتَ لَكَ جَنَّةٌ مِّنْ نَّجِيلٍ وَعَيْنٍ فَتَقْفِرُ ۖ أَلَمْ نَخْلُقْ لَهَا تَغْيِيرًا ۖ

When Allah The Almighty turns the sweet & fresh into salty, the human cannot afford to drink such salty water:

أَمَرَ يَسْمُ الْمَاءَ الَّذِي تَشْرَبُونَ ۖ ءَأَنْتُمْ أَنْزَلْتُمُوهُ مِنَ الْمُزْنِ أَمْ نَحْنُ الْمُنْزِلُونَ ۖ  
 لَوْ نَشَاءُ جَعَلْنَاهُ أُجَاجًا فَلَوْلَا تَشْكُرُونَ ۖ (27-الواقعة 70-68)

Allah The Almighty reveals in Qoran that when Mary مَرْيَمُ was alone in the jungle to give birth 'the baby Jesus' عيسى, Allah The Almighty guided her and provided her with 'dates' to eat and 'water' to drink for the survival of life. Here Allah The Almighty reveals that dates & water are constituents of food and food is basic need for survival, though Mary & Jesus were super human and full of Miracles:

فَدَعَا رَبُّكَ لَخَلْقِكَ سِرِّيَّاهُ وَهَزَّيْ إِلَىٰ بَيْتِكَ الْخَلْقَ تُسْقِطُ عَلَيْكَ  
 رَطْبًا جَنِيًّا ۖ فَطَلَّ وَاشْرَبَ ۖ وَقَرَّىٰ عَيْنًا ۖ (16-مريم 26-24)

The above Qoranic text also indicates that the fresh ripe fruits are most tasty and contain maximum numbers of 'Nutrients'.

The following Qoranic Verse indicates the existence of Digestive System in human body. Hunger develops only when the food eaten is digested & utilized within the human body and un-utilized part of the food is excreted out as 'faecal matter': (39-بلد-16-14) →



Food - A Basic Need ... contd...

أَرِطْعَمُ فِي يَوْمٍ ذِي مَسْغَبَةٍ ۚ يَتِيماً ذَا مَقْرَبَةٍ ۚ أَوْ مَسْكِينًا ذَا مَتْرَبَةٍ ۚ  
(30- البقر - 16-14)  
وَأَسْقَيْنَكُم مَّاءً فُرَاتًا ۚ (29- المرسلت - 27)

Prophets are after all human though 'superhuman' are not hollow bodied, but have got complete 'Digestive System', therefore, they feel hunger and eat foods to satisfy the hunger & they are not immortal creatures:

وَمَا جَعَلْنَاهُمْ جَسَداً لَّا يَأْكُلُونَ الطَّعَامَ وَمَا كَانُوا خَالِدِينَ ۝ (17- الأنبيا - 8)  
وَجَدَ عِنْدَ هَآرُونَ قَالِ يَمْزِيهِ أَتَىٰ لَكَ هَٰذَا طَمَأْتِ هُوَ مِنْ عِنْدِ اللَّهِ ۝ (3- آل عمران 37)  
Allah The Almighty provide foods to the 'Martyres'; who are killed in the way of Allah, is clear indication that food is must for the survival of life & Martyres are alive:

وَلَا تَعْسَفُ لَ الَّذِينَ قُتِلُوا فِي سَبِيلِ اللَّهِ أَمْوَاتًا بَلْ أَحْيَاءٌ عِنْدَ رَبِّهِمْ يُرْزَقُونَ ۚ (4- آل عمران - 169)

Even the prophets required foods for survival of life, though were super human full of miracles:

وَيَا أَدُمُ اسْكُنِ أَنْتَ وَزَوْجُكَ الْجَنَّةَ فَكُلَا مِنْ حَيْثُ شِئْتُمَا وَلَا تَقْرَبَا هَٰذِهِ الشَّجَرَةَ ۝ (8- الأعراف - 19)

وَقَالُوا مَا لِ هَٰذَا الرَّسُولِ يَأْكُلُ الطَّعَامَ وَيَمْشِي فِي الْأَسْوَاقِ ۝ (18- الفرقان - 7)

مَا هَٰذَا إِلَّا بَشَرٌ مِّثْلُكُمْ يَأْكُلُ مِمَّا تَأْكُلُونَ مِنْهُ وَيَشْرَبُ مِمَّا تَشْرَبُونَ ۝ (18- المؤمنون - 33)  
وَمَا أَرْسَلْنَا قَبْلَكَ مِنَ الْمُرْسَلِينَ إِلَّا أَنَّهُمْ نِيَآكُلُونَ الطَّعَامَ وَيَمْشُونَ فِي الْأَسْوَاقِ ۝ (18- الفرقان)

Allah The Almighty is the best supplier of your needs:

أَمْ تَسْأَلُهُمْ خَرْجًا فَقَرْجُ رَبِّكَ خَيْرٌ ۖ وَهُوَ خَيْرُ الرَّزَاقِينَ ۝ (18- المؤمنون - 72)

Food - A Basic Need ... contd...

The following Qoranic Verse indicates that 'Olive' is the best supplier of your basic need. For example, It contains 'oil'; which is used to eat, to cook and to create light:

مِنْ شَجَرَةٍ تُبْرَكَةٍ ذَيْتُونَةٍ لَا شَرْقِيَّةٍ وَلَا غَرْبِيَّةٍ لَا يَأْكُلُ مِنْ ثَمَرِهَا يُضَيُّءُ وَلَوْ  
لَمْ تَمْسَسْهُ نَارٌ ... ه (١٨-١٩-النور- ٣٥)

When Allah The Almighty stops the supply of basic needs, like food:  
وَلَا يُخْضِقُ عَلَى طَعَامٍ لِمُسْكِينٍ ه (٣٥- فريحي- 3)

Allah The Almighty bestowed the followers of Prophet Moses; the graceful place to live and pure, healthy & tasty food to eat:

وَلَقَدْ بَوَّأْنَا بَنِي إِسْرَءِيلَ مِوَاقِعَ مِنْ رِزْقِنَا مِنْ طَيِّبَاتِ ... ه  
(١١- يونس- ٩٣)  
يَأْتِيهَا الَّذِينَ آمَنُوا مِنْ طَيِّبَاتِ مَا رَزَقْنَاكُمْ ... ه (٢- البقرة- ١٦٢)

The people from Hell will beg water & food from Paradisers for their survival:

وَنَادَى الصُّلْبُ الِثَّارِ اصْحَبِ الْجَنَّةِ اِنَّ اَنْبِيَاؤَنَا عَمِلْنَا مِنْ الْمَاءِ اَوْ مِمَّا رَزَقَكَ اللهُ ... ه (٨-١٠-الاعراف- ٥٥)

Qoran indicates the belief of Hz Ibrahim a.s. that Allah bestows me food to eat and water to drink and cures me when I am sick:

وَالَّذِي هُوَ يُطْعِمُنِي وَيَسْقِينِ ه وَإِذَا مَرِضْتُ فَهُوَ يَشْفِينِ ه (١٩- الشعراء- ٦٩, ٨٥)

Allah The Almighty manages foods for you from sky and from below of your feet. It means that sky contributes sun light\*\* & carbon dioxide, while earth below your feet contributes water & minerals:

هُوَ الَّذِي يَجْعَلُ لَكُمْ الْأَرْضَ ذُلُولًا فَامْشَوْا فِي مَنَاكِبِهَا وَكُلُوا مِنْ رِزْقِهِ ... ه (٢٩- المائدة- ١٥)  
وَمَا أُنْزِلَ إِلَيْكُمْ مِنْ رَبِّكُمْ إِلَّا كَلُومًا مِنْ قَوْمِهِمْ وَمِنْ ثَمَرِ الْأَرْضِ ... ه (٦- المائدة- ٦٦)

The next sub-chapter ii, covers the foods, like fruits, vegetables & cereals etc. obtained from plants.

\*Lack of food creates hunger & hunger indicates existence of a System.

\*\*Plants prepare food by way of Photosynthesis, by the contribution sun light & carbon di-oxide from sky & water & minerals from the earth.

## sub chapter ii

### Foods from plants:

Allah The Almighty provides foods from plants as described below.

Allah The Almighty had bestowed the divine foods to the followers of Prophet Moses in the forms of Man & Salwa. But they insisted that Almighty must provide them the earthly foods like: Saag, Cucum-ber, wheat, pulse and onion, which can be grown out of earth:

وَأَذَلَّتُمْ يَمُوسَى لَن تَصْبِرَ عَلَى طَعَامٍ وَاحِدٍ فَأَرْزَقْنَا رَبَّكَ يُخْرِجُ لَنَا مِمَّا شِئْتُمُ  
الْأَرْضِ مِنْ بَقْلِصًا وَقَثَائِيمًا وَفُؤْمِيمًا وَعَدَسِيمًا وَبَصِيزِيمًا... هـ (١-البقرة-61)  
مَا أُرِيدُ مِنْكُمْ مِنْ رِزْقٍ وَمَا أُرِيدُ أَنْ يُطْعَمُونِ ۚ إِنَّ اللَّهَ هُوَ الرَّزَّاقُ ذُو الْقُوَّةِ الْمَتِينُ ۚ  
(٢٦-الذريت-57)

Allah The Almighty explains in the following Qoranic Verse that how the fruits come out of plants, which you eat as your food:

وَأَنْزَلْنَا مِنَ السَّمَاءِ مَاءً فَأَخْرَجَ بِهِ مِنَ الثَّمَرَاتِ رِزْقًا لَكُمْ ۚ هـ (١-البقرة-22)  
' أَوْ تَكُونُ لَهُ جَنَّةٌ يَأْكُلُ مِنْهَا... هـ (١٨-الفرقان-١8)

Allah The Almighty opens the hidden facts that humen get their food from sky and beneath the earth. It means that the contents of sky like: gases & sun and contents of earth like: water & minerals, contribute to plants in order to synthesised the foods:

وَمَا أُنْزِلَ إِلَيْكُمْ مِنْ رَبِّكُمْ إِلَّا حَقٌّ وَمِنْ قَوْعِهِمْ وَمِنْ تَحْتِ أَرْجُلِهِمْ... هـ (١٠-المائدة-66)

Allah The Almighty has created gardens of creepers & erected plants like Dates & Farms, which provide foods of different tastes. Also,

Olive & varieties of Pomegrante. Eat, when their fruits are ripe:

وَهُوَ الَّذِي أَنْشَأَ جَنَّاتٍ مَعْرُوشَاتٍ وَغَيْرَ مَعْرُوشَاتٍ وَالنَّخْلَ وَالزَّرْعَ مُخْتَلِفًا  
أُطْعُهُمُ وَالزَّيْتُونَ وَالرُّمَّانَ مُتَشَابِهًا وَغَيْرَ مُتَشَابِهٍ طَلُّوا مِنْ ثَمَرِهِ إِذَا أَثْمَرَ  
وَالْوَا حَقُّهُ يَوْمَ حَصَادِهِ... هـ (٨-الانعام-١4)

\*This Qoranic Verse indicates that tree provide sources; like fruits, cereals & vegetables.

Food from Plants ... contd...

Allah The Almighty reveals in Qoran that He created the fruits of Dates & Grapes. Humen obtain Alcohol & other delicious foods from the juices of Dates & Grapes:

وَمِنْ ثَمَرَاتِ النَّخِيلِ وَالْأَعْنَابِ تَتَّخِذُونَ مِنْهُ سَكَرًا وَرِزْقًا حَسَنًا إِنَّ فِي ذَلِكَ لَآيَةً لِّقَوْمٍ يَعْقِلُونَ ٥ (١٤ - السَّحَل - ٦٧)

Allah The Almighty rains water from the sky, growing plenty of vegetations, bearing males & female flowers and fruits. Eat them as your food and feed your cattles. There are signs for wise to ponder over:

وَأَنْزَلَ مِنَ السَّمَاءِ مَاءً فَأَخْرَجْنَا بِهِ أَزْوَاجًا مِّنْ نَّبَاتٍ شَتَّى ٥ كُلُوا وَارْعَوْا أَنْعَامَكُمْ إِنَّ فِي ذَلِكَ لَآيَاتٍ لِّأُولِي النُّعُولِ ٥ (١٦ - طه - ٥٣, ٥٤)

Allah The Almighty describes the lives of paradisers that they will be supplied with Ber, Banana and many other fruits to eat. Cold, sweet & fresh water to drink and a cool & comfortable place to live

فِي سِدْرٍ مَّخْضُودٍ ۖ وَطَلْحٍ مَّنضُودٍ ۖ وَظِلٍّ مَّمْدُودٍ ۖ وَمَاءٍ سَكُونٍ ۖ وَفَاكِهَةٍ كَثِيرَةٍ ۖ لَّا مَقْطُوعَةٍ ۖ وَلَا مَمْنُوعَةٍ ۖ (٢٧ - الواقعة - ٣٣-٢٨)  
لَّهُمْ فِيهَا نَضَاءٌ ۖ كَثِيرٌ ۖ وَهُمْ يَتَأَمَّلُونَ ٥ (٢٥ - الزخرف - ٧٣)

Allah The Almighty describes here the detailed process of 'germination', and how the plants come out by splitting the earth. The growth and later maturation of these plants/trees, when they produce

Grapes, Olives, Dates and other fruits & cereals, which are sources of humen & their cattles foods:  
فَلْيَنْظُرِ الْإِنْسَانُ إِلَى طَعَامِهِ ۚ أَنَّا صَبَبْنَا الْمَاءَ صَبًّا ۚ ثُمَّ شَقَقْنَا الْأَرْضَ شَقًّا ۚ فَأَنْبَتْنَا نَبَاتًا حَبًّا ۚ وَعَبَقًا وَمُضْبًّا ۚ وَرَزَقْنَاهُ وُثْرًا وَغُلًّا ۚ وَهُوَ آتٍ مِنْ غُلْبَةٍ ۚ وَأَنبَأَهُ مَنَّا نَلُّهُ ۚ وَلَا نَعْلَمُكُمْ ۚ (٣٥ - عبس - ٣٢-٢٤)

Foods from Plants ... contd...

The earth is dead. Allah The Almighty alives it and creates cereals out of it, which humen eat as their food. Also, created the gardens of Dates & Grapes to eat and streams of sweet & fresh water out of this earth to drink. The fruits you eat are not created by your hands, but Allah The Almighty has created them, then why are you not thankful to The Almighty:

رَأَيْتُمْ أَتُحْيِي الْمَيِّتَةَ عَلَىٰ أَحْيَئِنَّهَا وَأَخْرَجْنَا مِنْهَا خُبًّا فَمِنْهُ يُاْمُكُونُ ۚ وَجَعَلْنَا فِيهَا جَنَّاتٍ مِّنْ نَّخِيلٍ وَأَعْنَابٍ وَفَجَّرْنَا فِيهَا مِنَ الْعُيُونِ ۚ لَا يَأْكُلُونَ مِنْ ثَمَرِهِ ۚ ۝ (يُس- 35-33)

Allah The Almighty narrates that plants which provide us food is very important for our life. The The Almighty created the plant of 'pumpkin', in erected form, which is generally a 'creeper', to protect the life of Prophet Yunous a.s.:

فَنَبَذْنَاهُ بِالْعَرَاءِ وَهُوَ سَقِيمٌ ۚ وَأُنْبِتْنَا عَلَيْهِ شَجَرَةً مِّنْ يَقْطِطِينَ ۝ (الضُّحَىٰ- 145)

Allah The Almighty has created this earth for His living creatures. To bebefit them, Allah The Almighty has created Fruits, Covered Dates, Cereals covered with Husk and Flowers with fragrance. There are sources of your food which you cannot deny:

وَالْأَرْضَ وَضَعَهَا لِلْأَنْبَاءِ ۚ وَفِيهَا فَاكِهَةٌ وَالنَّخْلُ ذَاتُ الْأَكْمَامِ ۚ وَالْحَبُّ ذُو الْعَصْفِ ۚ وَالرَّيْحَانُ ۚ (الرحمن- 13-10)

When Allah The Almighty rains the water Mubarak\*, which vegetates the gardens, produce cereals, fruits & dates; providing foods to the creatures (humen):

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\*since water is of unique properties; water is clean/pure itself and capable to clean & purify the other things.

Food from Plants ... contd...

وَنَزَّلْنَا مِنَ السَّمَاءِ مَاءً مُبَارَكًا فَأَنْبَتْنَا بِهِ جِبْتٍ وَحَبَّ الْحَصِيدِ ۝ وَالنَّخْلَ بَسَقَتِ  
تَحَاتُّلِحُ لَحْيَانِهَا ۝ وَرِزْقًا لِلْعِبَادِ ۝ وَأَحْيَيْنَا بِهِ بَلَدًا كُفِّرَتْ عَنْهَا ۝ (26- ق - 11-9)

Allah The Almighty rains water from the sky, which causes vegetation like gardens of Grapes, Dates and fruits of various kinds, which you eat as your food. There is also Olive tree, grow on Sina mountain, producing fruits & edible oil:

وَأَنْزَلْنَا مِنَ السَّمَاءِ مَاءً يُفْزِرُ فَاسْكَنْهُ فِي الْأَرْضِ ۝ وَإِنَّا عَلَى ذَهَابٍ  
بِهِ لَقَادِرُونَ ۝ فَأَنْشَأْنَا لَكُمْ بِهِ جِبْتٍ وَجَبَلٍ وَأَنْبَتْنَا لَهُ مِنْهَا  
فَوَاكِهَ كَثِيرَةً وَمِنْهَا تَأْكُلُونَ ۝ وَسَجَّزَةً تَصْرُجُ مِنْ طُورِ سِينَاءَ تُنْتَبِطُ  
بِالَّذِ هُنَّ وَصَبَّحَ لِلْأُحْلِيِّينَ ۝ (18- المؤمنون - 20-18)  
وَإِذْ قَالَ إِبْرَاهِيمُ رَبِّ اجْعَلْ هَذَا بَلَدًا آمِنًا وَارْزُقْ أَهْلَهُ مِنَ الثَّمَرَاتِ ۝ (1- البقرة - 126)

Is there any one other than Almighty Allah who provides you food from sky & earth; means, water from sky causes germination and water & minerals from earth and sun & gases from sky help in food synthesis:

هَلْ مِنْ خَالِقٍ غَيْرُ اللَّهِ يَرِزُقُكُمْ مِنَ السَّمَاءِ وَالْأَرْضِ ۝ (22- فاطر - 3)  
قُلْ مَنْ يَرِزُقُكُمْ مِنَ السَّمَاءِ وَالْأَرْضِ ۝ (11- يونس - 31)

Allah The Almighty rains water from the sky, which causes vegetation and production of fruits & cereals, which we eat and feed our cattles:

أَوَلَمْ يَرَوْا أَنَّا نَسُوقُ الْمَاءَ إِلَى الْأَرْضِ الْجُرُزِ فَنُخْرِجُ بِهِ زَرْعًا تَأْكُلُ مِنْهُ  
الْأَنْعَامُ ۝ وَأَنْفُسُهُمْ أَفَلَا يُبْصِرُونَ ۝ (21- السجدة - 27)

Food from Plants ... contd...

Allah The Almighty rains pure water from the sky, which is also purifier; alives the dead earth; means causes vegetation and production of fruits & cereals (human & animals eat them as their food) and quenches the thirst of human & animals:

وَهُوَ الَّذِي أَرْسَلَ الرِّيحَ بُشْرًا مِّنْ بَيْنِ يَدَيْ رَحْمَتِهِ وَأَنْزَلْنَا مِنَ السَّمَاءِ مَاءً طَهُورًا لِّنُخْرِجَ بِهِ بَلْدَةً حَيَّةً وَنُسْقِطَ مِنْهَا طَلَقًا وَأَنْعَمْنَا عَلَى النَّاسِ وَلَهُمْ فِيهِ مِزْعَةٌ كَثِيرَةٌ  
(19- الفرقان 48-49)  
اللَّهُ الَّذِي خَلَقَ السَّمُوتِ وَالْأَرْضَ وَأَنْزَلَ مِنَ السَّمَاءِ مَاءً فَأَخْرَجَ بِهِ مِنَ الثَّمَرَاتِ رِزْقًا لَّكُمْ ۚ ۝ (13- ابراهيم 32)

Gardens bearing healthy fruits are the gifts from Almighty Allah for the people living in East & West. Eat them as your food and be thankful to The Almighty:

لَقَدْ كَانَ لَنَا فِي مَسْكَنِهِمْ آيَةٌ جَنَّاتٍ عَنْ يَمِينٍ وَشِمَالٍ كُلُوا مِنْ رِّزْقِ رَبِّكُمْ وَاشْكُرُوا لَهُ ۚ ۝ (22- سبا 15)

When Almighty Allah wills, He sends diseases\* causing infections to the fruits, which spoil and become non-eatable:

فَأَعْرَضُوا فَأَرْسَلْنَا عَلَيْهِمْ سَيْلَ الْعَرِمِ وَبَدَّ لَهُمْ بِجَنَّتَيْهِمْ جَنَّتَيْنِ ذَوَاتِ أُكُلٍ خَمْطٍ وَأَثْلٍ وَشَيْءٍ مِّن سِدْرٍ قَلِيلٍ ۝ (22- سبا 16)

Allah The Almighty has created sources of livelihood i.e. food, out of earth, for those who live on earth:

وَبَارَكْنَا فِيهَا وَكَرَّمْنَا فِيهَا أَقْوَامًا فِي رِيفَةٍ أُنْيَا ۚ ۝ (24- حم السجدة 10)

Allah The Almighty has created earth convenient for creating passage & cultivation to obtain your food:

هُوَ الَّذِي جَعَلَ لَكُمُ الْأَرْضَ ذُلُولًا فَامْشُوا فِي مَنَاكِبِهَا وَكُلُوا مِن رِّزْقِهَا ۚ ۝ (29- الملك 15)

\*In the form of heavy floods from two dams: 'Arim' & 'Maarib'



Food from Plants ... contd...

For the livelihood in Paradise, Allah The Almighty will place the Paradisers in the gardens of high quality, where they live happily and peacefully and the bunches of fruits will be very close to them so that they may pluck and eat the fruits when desire and drink pure, fresh and sweet water from the streams of Paradise:

فِي جَنَّاتٍ عَالِيَةٍ لَّا تَطُوقُهَا رَأْسِيهِمْ كُلُّوا وَاشْرَبُوا هَنِيئًا ۖ ه (29-الحاقة-)  
(22 & 24)

Allah The Almighty expanded the earth, (rains water from the sky. Some of the rained water goes beneath the earth and stores there) and created water & pasture out of it. Fruits & Cereals from the vegetation & water provide foods to you and to your animals:

وَالْأَرْضُ بَعْدَ ذَلِكَ رَحِيمًا ۖ أَخْرَجَ مِنْهَا مَاءً وَمَرْعًا ۖ وَالْجِبَالُ أَرْسَالًا مَّتَاعًا  
لَّكُمْ وَلِأَنْعَامِكُمْ ۖ ه (30-النزعت- 30-35)  
وَلَقَدْ مَكَّنَّاكُمْ فِي الْأَرْضِ وَجَعَلْنَا لَكُمْ فِيهَا مَعَايِشَ ۗ قَلِيلًا مَّا تَشْكُرُونَ ه (8-الاعتراف)

For the livelihood of the Paradisers, Allah The Almighty will provide them with gardens, beneath which streams will be flowing. The fruits of the gardens will be offered to the Paradisers as their food. After seeing the varieties of the fruits, they will excitedly say, "these are the same fruits, Almighty had bestowed us in the mortal world: .

وَبَشِّرِ الَّذِينَ آمَنُوا وَعَمِلُوا الصَّالِحَاتِ أَنَّ لَهُمْ جَنَّاتٍ تَجْرِي مِنْ تَحْتِهَا  
الْأَنْهَارُ كُلَّمَا رُزِقُوا مِنْهَا مِنْ ثَمَرَةٍ رِزْقًا قَالُوا هَٰذَا الَّذِي رُزِقْنَا مِنْ قَبْلُ  
وَالْوَايَ بِهِمْ مِمَّا يَشْعَبُونَ ۖ ه (1-البقرة- 25)

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\*Allah The Almighty is so kind to us that He has created tastiest & richest in containing nutrients, like dates, grapes & pomegranates etc., for us in this mortal world, and promises to provide us in paradise.

## sub chapter iii

Food From Animals:

Allah The Almighty has provided us cattles and many other animals, which move on earth. These animals are gift from The Almighty, as they can be used as a means of transport, for ploughing our fields, a source of natural fertilizer for plants, a source of producing milk, which we use as food and also their flesh. But, The Almighty has imposed restrictions, not to eat the flesh of certain animals **خنزير وحيوان الحرام**. When the animals, which are allowed by The Almighty to eat, are slaughtered with The Name of Almighty, their flesh are eaten and their bones and skin are utilised for multipurpose.

Allah The Almighty instructs the humen, in the following Qoranic Verse, to eat the flesh of animals, which cannot speak (like humen speaks). Also, distribute the animal flesh amongst the paupers sorrounded with difficulties:

عَلَىٰ مَا رَزَقَهُمْ مِن بَحِيمَةِ الْأَنْعَامِ قَطَعُوا مِنْهَا وَأَطِيعُوا الْبَوَائِسَ الْفَقِيرَةَ  
(17- الحج - 28)

Allah The Almighty again instructs us to sacrifice/slaughter in the Name of Almighty Allah, the cattles, particularly the healthy cows & camels. Eat the flesh of these cattles and offer the flesh to the paupers and alm mongers:

وَأَحَلَّتْ لَكُمْ الْأَنْعَامَ إِلَّا مَا يُتْلَىٰ عَلَيْكُمْ ... هـ (17- الحج - 30)  
وَلِكُلِّ أُمَّةٍ جَعَلْنَا مَنْسَكًا لِّيَذْكُرُوا اسْمَ اللَّهِ عَلَىٰ مَا رَزَقَهُمْ مِن بَحِيمَةِ الْأَنْعَامِ  
فَالْحُكْمُ لِلَّهِ الرَّاحِدِ ... هـ وَالْبُذُنَ جَعَلْنَاهَا لَكُمْ مِّن شَعَائِرِ اللَّهِ لَكُمْ فِيهَا خَيْرٌ  
فَاذْكُرُوا اسْمَ اللَّهِ عَلَيْهَا صَوَآتٍ فَأَزَاوَجَبْتُمْ لَهَا قَطَعُوا مِنْهَا وَأَطِيعُوا الْقَائِمَ  
وَالْمُعْتَرِطَ ... هـ (17- الحج - 34 - 36)

Food from Animals ... contd...

Allah The Almighty instructs us to eat the flesh of those animals, which are allowed by The Almighty, like flesh of 'Halal' cattles only; cow, camels, goats and all other animals, whose toes are bifurcated, excluding the pig:

يَا أَيُّهَا النَّاسُ كُلُوا مِمَّا فِي الْأَرْضِ حَلَالًا طَيِّبًا ط (2- البقرة - 168)

Allah The Almighty prohibits the hunting of animals of dry land, to obtain your food, once you are bound for pilgrimage/Hajj:

أُحِلَّ لَكُمْ صَيْدُ الْبَحْرِ وَطَعَامُهُ مَتَاعًا لَكُمْ وَلِلسَّيَّارَةِ وَحُرِّمَ عَلَيْكُمْ صَيْدُ الْبَرِّ مَا دُرُّكُمْ حُرْمًا ط... ه (7- المائدة - 96)

Allah The Almighty has created the animals like Sheep, Goat, Cow, Horse & Pony etc., which produce wool, food i.e. flesh & milk, and are used as mode of transport:

وَالْأَنْعَامَ خَلَقَهَا لَكُمْ فِيهَا دِمٌّ وَمِنْهَا رِجَالٌ وَمِنْهَا تَنَاقُلٌ ط (14- النحل - 5)  
وَذَلَّلْنَاهَا لَهُمْ فَمِنْهَا رَكُوبُهُمْ وَمِنْهَا يَأْكُلُونَ ه وَلَهُمْ فِيهَا مَنَاقِبُ وَمِنْ مَتَابِئِهِ ه (23- يس - 13-15)

Allah The Almighty has bestowed us a very rich and tasty food i.e. 'milk', which obtained from cattles like cow, goat & camels. When these animals eat their food and food taken is digested. Allah The Almighty has bestowed animals with a very special 'analytical-machine', which separates the digested food into blood & milk and undigested food is excreted out as dung. The milk is very tasty to drink and there is no smell of blood of dung in it:

وَإِنَّ لَكُمْ فِي الْأَنْعَامِ لَعِبْرَةً ط نُسْقِيكُمْ مِمَّا فِي بُطُونِهِمْ مِنْ بَيْنِ فَرْثٍ وَرِيمٍ لُبْنَانًا خَالِصًا سَائِبِغًا لِلشَّارِبِينَ ه (14- النحل - 66)

When Hz Ibrahim a.s. invited the Angels to eat the roasted beef:

فَجَاءَ بِجِلِّ سَمِينٍ ه فَتَرَبَّعُوا لَيْلَةً ط قَالَ لَا تَأْكُلُونَ ه (26- الذریت - 26, 27)

Food from Animals ... contd...

Allah The Almighty has created cattles, from which you obtain your food i.e. flesh & milk and also, you use them as your means of transport. And you obtain a lot of benefits from them:

وَأِنَّ لَكُمْ فِي الْأَنْعَامِ لَعِبْرَةً ۖ نُسْقِيكُمْ مِمَّا فِي بُطُونِهَا وَلَكُمْ فِيهَا مَنَافِعُ

كَثِيرَةٌ وَمِنْهَا تَأْكُلُونَ ۝ (١٨ - المؤمنون - ٢١)

• اللَّهُ الَّذِي جَعَلَ لَكُمْ الْأَنْعَامَ يَتَرَكِبُوهَا مِنْهَا وَ مِنْهَا تَأْكُلُونَ ۝ (٢٤ - المؤمنون - ٢٩)

The following Qoranic Verse indicates that the flesh of the animals, which we eat as our food is the transformed form of grass:

هُوَ الَّذِي أَنْزَلَ مِنَ السَّمَاءِ مَاءً لَكُمْ مِنْهُ شَرَابٌ وَمِنْهُ شَجَرٌ يُؤْتِيهِ ثَمَرٌ مُتَمُوتٌ ۝ (١٤ - النحل - ١٥)

The next sub-chapter iv, contains the foods obtained from air i.e. from birds & insects particularly from Honey Bee, and foods obtained from sea i.e. from fish and other marine animals.

## sub chapter iv

Food from Sea & Air:FOOD FROM SEA:

Allah The Almighty allows you to hunt in sea to obtain your food once you are in Ahram i.e. bound for Pilgrimage/Hajj:

أُحِلَّ لَكُمْ صَيْدُ الْبَحْرِ وَطَعَامُهُ مَتَاعًا لَّكُمْ وَلِلسَّيَّارَةِ وَحُرِّمَ عَلَيْكُمْ صَيْدُ الْبَرِّ مَا  
رُمْتُمْ حُرْمًا ۚ (7 - المائدة - ٩٦)

Allah The Almighty has created two types of seas; i) sea of sweet water which is tasty and drinkable, and ii) sea of salty water, which is bitter in taste and not drinkable. Allah The Almighty has also created Fish & other marine animals, which human utilise as their food:

وَمَا يَشْتَرُونَ بِهِ ذَاتُ بَرَكَاتٍ سَائِغٌ شَرَابُهُ وَهَذَا مِلْحٌ  
أُجَاجٌ ۚ وَمِنْ كُلِّ تَاكُلُونَ لَحْمًا طَرِيًّا وَتَسْتَخْرِجُونَ حِلْيَةً تَلْبَسُونَهَا ۚ (22 - فاطر - ١٢)

Allah The Almighty has also created Rivers for you to hunt and eat the fresh flesh of the animals available in the River:

وَهُوَ الَّذِي سَخَّرَ الْبَحْرَ رِبًّا تُآْكَلُونَ مِنْهُ لَحْمًا طَرِيًّا ۚ (١٤ - النحل - ١٤)

Prophet Moses was carrying cooked fish as his tiffin while travelling:

فَلَمَّا بَلَغَا مَجْمَعَ بَيْنَهُمَا لَبِيا حَوْثُمَا فَاتَّخَذَ سَبِيلَهُ فِي الْبَحْرِ سَرَبًا  
فَلَمَّا جَاوَزَا قَالَ يَفَتِّهُمُ اتِّبَاعُكَآءُنَا زِلْقَدَ لَقِينَا مِنْ سَفَرِنَا هَذَا نَصَبًا  
(١٥ - القصص - ٦٢, ٦١)

Food from Sea & Air ... contd...

### Food from Air:

Allah The Almighty has created birds & insects, the sources of foods for human. The following Qoranic Verses indicate the sources of food from air.

وَفِي السَّمَاءِ رِزْقُكُمْ وَمَا تُوعَدُونَ ه (26- الذریت- 22)

Allah The Almighty has created an insect, the 'Honey-Bee', which flies in the air and make its bee-hive, either on the mountain/top places, on the trees or on the ceilings and sucks juices of flowers & fruits, under the guidance of Almighty Allah. The juices are converted into 'Honey', a very tasty liquid within the body of honey-bee. Honey is a food and medicine guaranteed for good health:

وَأَرْسَلْنَا إِلَى آلِ الْكَافِرِينَ مِنَ الْجِبَالِ بُيُوتًا وَمِنَ الشَّجَرِ وَمِمَّا  
يَخْرُجُونَ ه ثُمَّ كُلُّ مِنْ كُلِّ الشَّجَرِ فَاسْلُكُوا سَبِيلَ رَبِّكَ ذُلَّالًا يَخْرُجُ مِنْ  
بُطُونِهَا شَرَابٌ مُخْتَلِفٌ أَلْوَانُهُ فِيهِ شِفَاءٌ لِلنَّاسِ إِنَّ فِي ... يَتَفَكَّرُونَ ه  
(14- النحل- 69- 68)

Allah The Almighty will bestow the paradisers, the worldly food; 'the flesh of birds', and fruits, as the paradisers will wish:

وَلَكُمْ طَيْرٌ مِّمَّا يَشْتَهُونَ ه (27- الواقعة- 21)

Allah The Almighty had bestowed to the followers of Prophet Moses; 'The Man & Salwa', a divine food in the form of roasted birds and honey type liquid:

وَأَنْزَلْنَا عَلَيْكُمُ الْمَنَّاءَ وَالسَّلْوَى ط كُلُوا مِنْ طَيِّبَاتِ مَا رَزَقْنَاكُمْ ه (1- البقرة- 57)

وَنَزَّلْنَا عَلَيْكُمُ الْمَنَّاءَ وَالسَّلْوَى ه كُلُوا مِنْ طَيِّبَاتِ مَا رَزَقْنَاكُمْ ... ه  
(16- طه- 81- 80)

وَفِي السَّمَاءِ رِزْقُكُمْ وَمَا تُوعَدُونَ ه (26- الذریت- 22)

وَأَذْهَبَ الْخَوَارِثُونَ لِعِيسَى ابْنِ مَرْيَمَ هَلْ يَسْتَطِيعُ رَبُّكَ أَنْ يُنْزِلَ عَلَيْنَا مَائِدَةً مِنَ السَّمَاءِ ه قَالُوا  
نُرِيدُ أَنْ نَأْكُلَ مِنْهَا ه قَالَ عِيسَى ابْنُ مَرْيَمَ اللَّهُمَّ رَبَّنَا أَنْزِلْ عَلَيْنَا مَائِدَةً مِنَ السَّمَاءِ ه وَارْزُقْنَا وَأَنْتَ  
خَبِيرُ الْغُيُوبِ ه (7- المائدة- 112- 114)

## sub chapter v

Prohibited Food:

Certain things Allah The Almighty has prohibited to eat the food like; dead animals, blood, pork and halal animals slaughtered with the name of other than Allah The Almighty:

إِنَّمَا حَرَّمَ عَلَيْكُمُ الْمَيْتَةَ وَالدَّمَ وَلَحْمَ الْخِنْزِيرِ وَمَا أُهِلَّ بِهِ لِغَيْرِ اللَّهِ بِهِ... هـ  
(14- النحل - 115)

كُلْ لَّا آجِدُ فِي مَا أُوحِيَ إِلَيَّ مُحَرَّمًا عَلَى طَاعِمٍ يَطْعَمُهُ إِلَّا أَنْ يَكُونَ مَيْتَةً أَوْ دَمًا مَسْمُومًا أَوْ لَحْمَ خِنْزِيرٍ فَإِنَّهُ رِجْسٌ أَوْ فِسْقًا أُهِلَّ

لِغَيْرِ اللَّهِ بِهِ... هـ (8- الانعام - 145)

إِنَّمَا حَرَّمَ عَلَيْكُمُ الْمَيْتَةَ وَالدَّمَ وَلَحْمَ الْخِنْزِيرِ وَمَا أُهِلَّ بِهِ

لِغَيْرِ اللَّهِ... هـ (2 - البقرة - 173) وَلَا تَقْرَأُوا هَذِهِ الشَّجَرَةَ... هـ (1- البقرة - 35)\*

In the continued 5th sub chapter, I view the scientific aspects of prohibited food mentioned in Qoran. Also, the negative impact on health due to intake of the prohibited food.

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\*by eating the contents of the prohibited tree, Allah The Almighty developed un-necessary sex.

## sub chapter v

Prohibited Food: ... contd...

It is living 'Miracle' of Qoran, which prohibits certain things not eat. Almost, after fifteen hundred years, scientists are successful in observing that Qoranic revelation regarding prohibited food, is purely 100% true. Therefore, modern science proves true, the Qoranic sayings, as mentioned earlier in the Qoranic Verses: about the dead animals, blood, pork & halal animals slaughtered with the name other than Almighty Allah:

- 1) DEAD ANIMALS: If you eat the flesh of a dead animal you may not be knowing the reasons of its death. May its body contain and host a number of fatal microbes of certain disease (and that may be the reason of its death). Therefore, scientifically, it is not advisable to eat such infected flesh.
- 2) BLOOD: When the Microbes of diseases hit our or animals body, they first enter to the blood circulation. W.B.C.\* of the blood fights with the microbes. Therefore, in case the blood is defeated, microbes engulf the w.b.c. & vanish them and ultimately, rein over the blood circulation. If the blood defeats the microbes, the individual remains healthy, but blood circulation is always in contact with outside air/atmosphere through 'respiration'.
- 3) Pig is a very dirty animal, living in the dirtiest place of the locality and eating the dirtiest possible forms of food.

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\*the constituents of W.B.C., like Neutrophils & Monocytes are phagocytes.



Prohibited Food ... contd...

Pig is major host of 'liver-fluke' and other parasites\*, which may be the reason of fatal diseases if pork is consumed as food.

- 4) When halal animals is slaughtered with the name of Almighty Allah, a Muslim believes that Allah The Almighty is witnessing his sacrifice. At this stage he will arrange the best possible healthy animal for 'sacrifice'. Thus you will be able to get the tastiest and richest in nutrients, food to eat.

Science also views that plants & animals are sources of human food. It emphasises that food whether from plants; vegetarian or from animals; non-vegetarian, must be enriched with the nutrients, like; Proteins, Carbohydrates, Fats, Vitamins, Minerals & Water, (be found in food taken in sufficient quantities). Food enriched with all sorts of nutrients, is termed as balanced diet.

Science only prohibits to take spoilt food and animals, vegetables or fruits infested by the harmful bacteria or diseases.

In the next continued chapter, I am going to review the scientific aspects of food in details. While the sub chapter vi, contains the various body systems mentioned in Qoran, like i) Digestive System, ii) Blood Circulatory System, iii) Nervous System and iv) Reproductive system.

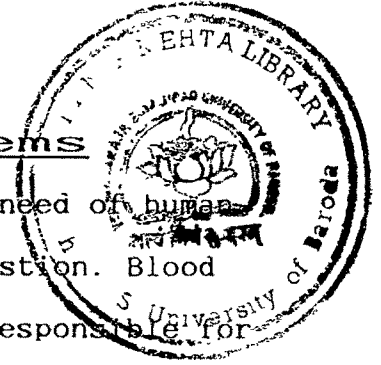
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\*Taenia Solium & Ascaris etc

## sub chapter vi

### Food, Blood and Body Systems

Qoran has already discussed that food is the basic need of human. When food is consumed, converts to blood after digestion. Blood thus produced vitalises the various body systems, responsible for different functions. Let me take certain body systems one by one as indicated in Qoran.



1. Digestive System
2. Blood Circulatory System
3. Nervous System
4. Reproductive System

### Digestive System

The following Qoranic Verses indicate the existence of Digestive System in human body. The hunger proves the existence of a system which consumes the food taken:

الَّذِينَ أَطْعَمَهُمْ مِنْ جُوعٍ هـ (30 - قريش - 4) وَلَتَبْلُوَنَّهُمْ بَشَىٰ مِنْ الْخَوْفِ وَالْجُوعِ  
وَنَقَمٍ مِنَ الْأَمْوَالِ وَالْأَنْفُسِ وَالثَّمَرَاتِ هـ (2 - البقرة - 155) وَلَا يَحْضُ عَلَىٰ طَعَامِ  
الْمُسْكِينِ هـ (30 - الماعون - 3) هـ (29 - الحاقة - 24) وَلَمْ تَكُنْ تُطِعمُ الْمُسْكِينِ هـ (29 - المدثر)  
وَضَرَبَ اللَّهُ مَثَلًا قَرْيَةً كَانَتْ آمِنَةً مُطْمَئِنَّةً يَأْتِيهَا رِزْقُهَا رَغَدًا مِنْ كُلِّ مَكَانٍ فَكَفَرَتْ بِأَنْعُمِ اللَّهِ  
فَأَذَانُهَا اللَّهُ يَبَاسَ الْجُوعِ وَالْخَوْفِ هـ (14 - النحل - 112) أَوْ أَلْطَمُوا فِي يَوْمٍ مُسْجَفَةٍ هـ (30 - بلد)  
وَيُطْعَمُونَ الطَّعَامَ عَلَىٰ حُبِّهِ مِسْكِينًا وَيَتِيمًا وَأَسِيرًا هـ (29 - الدهر - 8)

The descriptions of Oesophagus & Intestine in Qoran, indicate the existence of Digestive System: (29 - المزمل - 13) وَطَعَامًا زَاغُمًا وَعَذَابًا أَلِيمًا  
Allah The Almighty says in Qoran that the Prophets, who were super human, were not the empty bodied, but having got the digestive system and were eating food like common man:

وَمَا جَعَلْنَاهُمْ جَسَدًا لَا يَأْكُلُونَ الطَّعَامَ وَمَا كَانُوا خَالِدِينَ هـ (17 - الانبياء - 8)

\*Qoranic Verse describes Intestine: إِلَّا مَا حَمَلَتْ ظُهُورُهُمْ أَوِ الْحَوَايَا أَوْ مَا  
اخْتَلَطَ بِعَظْمِهِ هـ (8 - الانعام - 146) هـ (14 - النحل - 66)

digestive system ... contd...

Allah The Almighty narrates the story of 'صحاب الكهف', who died for a long period\* by will of Allah. The felt hunger as soon as Allah The Almighty revived their lives, indicates that there is a body system that requires food to continue the activities of life:

قَالُوا رَبُّكُمُ اعْلَمُ بِمَا لَيْسَتْمْ فَاذْبَعُوا آحَدَكُمْ بِوَرِكَيْهِ هَذِهِ آيَاتُنَا نَنْتَظِرُ إِنَّمَا أَزْكُ  
طَعَامًا فَلْيَأْكُلْهُ بِرِزْقِ رَبِّهِمْ ه (١٥- الكهف - ١٩)

The paradisers will be supplied enough food to eat & enough water & other holy liquid to drink that they may not feel hunger & thirst in the paradise:

إِنَّ لَكَ الْأَنْجُوعَ نَبِيحًا وَلَا تَعْرَى وَلَا تَنْضَى ه (١٦- طه ١١٨, ١١٩)

### Blood Circulatory System:

The following Qoranic Verse indicates that food taken is digested & converted in to blood, milk/fatty acid. Blood streams into Blood Circulatory System, Fatty Acid is assimilated into Lymphatic System & undigested food passes out in the form of faeces:

وَأَنَّ لَكُمْ فِي الْأَنْعَامِ لَعِبْرَةً نُسْقِيكُمْ مِمَّا فِي بُطُونِهِمْ مِنْ بَيْنِ فَرْثٍ وَدَمٍ نَبْتًا  
خَالِصًا سَائِغًا يَشْرِبُونَ ه (١٤- النمل - ٦٦\*)

The following Qoranic Verses indicate that the main organ of the Blood Circulatory System is Heart and life lines connect the whole body with the heart:

وَلَقَدْ خَلَقْنَا الْإِنْسَانَ ... وَنَحْنُ أَقْرَبُ إِلَيْهِ مِنْ حَبْلِ الْوَرِيدِ ه (٢٦- ق- ١١٦)  
لَمْ نَقْطَعْ مِنْهُ الشُّوْبَيْنِ ه فَمَا مِنْكُمْ مِنْ أَحَدٍ عَنْهُ حَاجِزِينَ ه (٢٩- الحاقة ٤٦, ٤٧)

Allah The Almighty indicates in Qoran that heart beats, which pumps in & out the blood into circulation:

إِنَّ فِي ذَٰلِكَ لَذِكْرًا لِمَنْ كَانَ لَهُ قَلْبٌ أَوْ أَلْقَى السَّمْعَ وَهُوَ شَهِيدٌ ه (٢٦- ق- ٣٧) (البقر- ٨٤)  
فُلُوبٌ يَوْمَئِذٍ وَاجِفَةٌ ه (٣٥- انزلعت- ٨) قَالُوا لَا تَجْعَلْ بَيْنَنَا ... وَيَسْخُفُّكَ الدِّمَاءُ ه (البقرة- ٣٥)

\*more than 100 years.

\*\*This Qoranic Verse interlinks Digestive System with Blood Circulatory System.

Blood Circulatory System ... contd...

Qoran indicates that heart is protected within a cover, called peri-

cardium: وَقَالُوا قُلُوبُنَا غُلْفٌ (البقرة-88) وَجَعَلْنَا عَلَى قُلُوبِهِمْ أَكِنَّةً (7- الانعام-25) وَقَالُوا قُلُوبُنَا غُلْفٌ (البقرة-88) وَقَالُوا قُلُوبُنَا فِي أَكِنَّةٍ (24- خَم-5) وَخَسَمَ عَلَى قُلُوبِكُمْ (7- الانعام-46)

The following Qoranic Verse indicates that heart is associated with blood which posses Iron, because Iron has the property of rusting:

ظَلَّ بِلَّ سَتْرَانِ عَلَى قُلُوبِهِمْ مَا كَانُوا يَكْسِبُونَ (30- المطففين-14)

Allah The Almighty guarantees that no one has two hearts, but there is only heart within human body:

مَا جَعَلَ اللَّهُ لِرَجُلٍ مِنْ قَلْبَيْنِ فِي جَوْفِهِ (21- الاحزاب-4)

فِي قُلُوبِهِمْ مَرَضٌ فَتَرَاكِهِمُ اللَّهُ مَرَضًا (1- البقرة-10)

Certain disease stops the normal functioning of heart & also causes

suffocation: لَئِنْ لَمْ يَنْتَهِ الْمُنْفِقُونَ وَالَّذِينَ فِي قُلُوبِهِمْ مَرَضٌ (22- الاحزاب-60)

وَأَنْذِرْهُمْ يَوْمَ الْأَرْزَقِ إِذْ يَقُولُ لَدَى الْحَنَاجِرِ كَافٍمِينَ (24- المؤمن-18) فِي قُلُوبِهِمْ مَرَضٌ أَمْ حَسِبَ الَّذِينَ فِي قُلُوبِهِمْ مَرَضٌ (26- محمد-29) وَأَيُّ ذُنُوبِهِمْ عَظِيمٌ (13- ابراهيم-43)

Sometimes, when heart, eyes & ears stop functioning, while they are alive:

وَرَأَى ذِكْرَ اللَّهِ وَخَدَّهُ اسْمًا زَتْ قُلُوبُ الَّذِينَ لَا يُؤْمِنُونَ بِالْآخِرَةِ (24- الزمر-45)

وَحُتِّمَ عَلَى سَمْعِهِمْ وَقُلُوبِهِمْ وَجَعَلَ عَلَى بَصَرِهِمْ عِشْرَةً (25- المجاثية-23)

Allah The Almighty has described many places in Qoran; the creation of heart. This indicates the importance of existence heart:

إِنَّ السَّمْعَ وَالْبَصَرَ وَالْفُؤَادَ كُلُّ أُولَئِكَ كَانَ عَنْهُ مَسْئُولًا (15- بنى اسراءيل-36) وَهُوَ الَّذِي أَنْشَأَ

لَكُمْ السَّمْعَ وَالْأَبْصَارَ وَالْأَفْئِدَةَ (18- المؤمنون-78) قُلْ هُوَ الَّذِي أَنْشَأَكُمْ وَجَعَلَ لَكُمُ

السَّمْعَ وَالْأَبْصَارَ وَالْأَفْئِدَةَ (29- الملك-23) وَجَعَلْنَا لَكُمْ سَمْعًا وَابْصَارًا وَأَفْئِدَةً (24- الاحقاف-24)

أَفَلَمْ يَسِيرُوا فِي الْأَرْضِ فَتَنْظُرُوا لَهُمْ قُلُوبٌ يَحْقِلُونَ بَعَاءً (17- الحج-46) وَجَعَلَ لَكُمْ السَّمْعَ وَ

الْأَبْصَارَ وَالْأَفْئِدَةَ (21- السجدة-9)

\* (29- المرثر-31)

\*\*very low heart beats.

The way Digestive System is linked with the Bloody Circulatory System, the Blood Circulatory System is linked with Respiratory System. Qoran describes human; a creature which respi-res. For example, humen are created from one respiratory creature i.e. Adam: <sup>٨٩</sup>يَا أَيُّهَا النَّاسُ اتَّقُوا رَبَّكُمُ الَّذِي خَلَقَكُمْ مِنْ نَفْسٍ وَاحِدَةٍ <sup>٥٥</sup>(4-انشاء-١٠) ٤ (9-امرئ: Adam) Again, Qoran say that all the respiratory creatures are to die:

كُلُّ نَفْسٍ ذَائِقَةُ الْمَوْتِ <sup>٥٥</sup>(4-ال عمران-١٨٥), (17-الا نبياء-35) (21-عنكبوت-57)

Allah The Almighty instructs the human not to kill those respiratory creatures i.e. animals, to obtain your food, which Allah The Almighty prohibits to eat:

وَلَا تَقْتُلُوا النَّفْسَ الَّتِي حَرَّمَ اللَّهُ إِلَّا بِالْحَقِّ <sup>٥٥</sup>(45-بنی اسرائیل-33)

Allah The Almighty describes in Qoran, the mechanism of respiration; that when the horses run fast, their chest & lungs create sound during the process of inhale & exhale: <sup>٢</sup>وَالْغِبْ يَتِ صُبْحًا لَمَّا تَوَارَبَتِ قَدَمَاهُ (غديت)

### Nervous System:

The Qoran describes the existence of Nervous System i.e. Brain, Ears Eyes, Nose, Tounge, Lips & Skin etc.

### The Brain:

The Qoran mentions the brain many places:

كَيْتَبُ قُضِيَّتْ أَيْتُهُ قُرَّانًا عَرَبِيًّا لِقَوْمٍ يَعْلَمُونَ <sup>٥</sup>(24-الحج السجدة-3)  
 أَفَلَمْ تَكُونُوا تَعْقِلُونَ <sup>٥</sup>(23-يونس-62) كَيْتَبُ أَنْزَلْنَاهُ إِلَيْكَ مُبَارَكًا لِيَذَّبَ رُؤَا أَيْتِهِ وَ  
 لِيَتَذَكَّرَ أُولُو الْأَلْبَابِ <sup>٥</sup>(23-ص-29) وَذِكْرِي لِأُولِي الْأَلْبَابِ <sup>٥</sup>(23-ص-43) أَوَلَوْ كُنَّا نُوَلِّ الْأَعْيُنُ شَيْئًا  
 وَلَا نَعْقِلُونَ <sup>٥</sup>(24-الزمر-43) ذِيكَ بِأَيْتِهِ قَوْمٌ لَا يَعْقِلُونَ <sup>٥</sup>(28-الحشر-١4) ٤ (6-المائدة-58)  
 لَقَدْ كَانَ فِي قَصَصِهِ عِبْرَةٌ لِأُولِي الْأَلْبَابِ <sup>٥</sup>(13-يوسف-١١١) إِنَّمَا يَتَذَكَّرُ أُولُو الْأَلْبَابِ <sup>٥</sup>(ربلا)  
 لَقَدْ أَنْزَلْنَا إِلَيْكُمْ كِتَابًا فِيهِ ذِكْرُكُمْ أَفَلَا تَعْقِلُونَ <sup>٥</sup>(17-الا نبياء-١٥٦) قَالَ رَبِّ الْمُسْتَرِقِ وَالْمَغْرِبِ وَمَا  
 بَيْنَهُمَا إِنَّ كُنْتُمْ تَعْقِلُونَ <sup>٥</sup>(19-الشعراء-28) وَالْمُؤْمِنِ يَأُولِي الْأَلْبَابِ <sup>٥</sup>(2-البقرة-١٩٧)

وَلْيَعْلَمُوا أَنَّمَا هُوَ إِلَهٌ وَاحِدٌ وَيَذْكُرُوا لِلَّهِ الْآيَاتِ ۚ (١٣- ابراهيم- ٥٢) إِنَّ أَخْبَرِي الْأَعْلَى  
الَّذِي فَطَرَنِي ۚ أَفَلَا تَعْقِلُونَ ۝ (١٢- هود- ٥١) إِنَّمَا يَنْتَظِرُ الْآيَاتِ ۚ.. أُولَئِكَ الَّذِينَ يَنْ  
هَكُنْ هُمْ اللَّهُ وَأُولَئِكَ هُمُ الْآيَاتِ ۚ (٢٥- الزمر- ٢١, ١٨, ٩)

The Qoranic Verses indicate that Brain is directly interlinked with the sensory organs, like ears & eyes etc:

أَفَأَنْتَ تُسْمِعُ الصُّمَّ وَلَوْ كَانُوا لَا يَعْقِلُونَ ۝ وَمِنْهُمْ مَّنْ يَنْتَظِرُ إِلَيْكَ ۚ أَفَأَنْتَ تُهْدِي الْعُمْيَ  
وَلَوْ كَانُوا لَا يَبْصُرُونَ ۝ (١١- يونس- ٤٢, ٤٣) لِنَجْعَلَهَا لَكُمْ تَذْكِرَةً وَتَعِيَهَا أُذُنٌ وَاعِيَةٌ ۝ (٢٩- المائدة)

### Ears & Eyes:

Allah The Almighty has created ears; the organ of hearing & eyes; the organ of vision:

مِمَّا تَدْعُونَا إِلَيْهِ وَفِي آذَانِنَا وَقْرٌ ۝ (٢٤- خم- ٥) وَالَّذِينَ لَا يُؤْمِنُونَ فِي آذَانِهِمْ وَقْرٌ  
وَهُوَ عَلَيْهِمْ عَمًى ۚ أُولَئِكَ يُنَادُونَ مِنْ مَّكَانٍ بُعِيدٍ ۚ (٢٤- خم- ٤٤) وَمِثْلُ الَّذِينَ كَفَرُوا كَمَثَلِ  
الَّذِي يَتَّبِعُ بِمَا لَا يُسْمِعُ إِلَّا أَرْعَاءً وَبَدَاءً ۚ صُمٌّ بُلْمٌ عُمْيٌ فَهُمْ لَا يَحْكُمُونَ ۚ (٢١- البقرة- ١٧١)  
يَوْمَ يَسْمَعُونَ الصَّيْحَةَ بِالْحَقِّ ۚ... ۝ (٢٦- ق- ٤١) أَفَأَنْتَ تُسْمِعُ الصُّمَّ أَوْ تَهْدِي الْعُمْيَ ۝ (٢٥- الزخرف- ٤٥)  
وَلَوْ نَشَاءُ لَطَمَسْنَا عَلَى أَعْيُنِهِمْ فَاسْتَبَقُوا الصِّرَاطَ فَأَنَّى يُبْصِرُونَ ۝ (٢٥- يس- ٦٦) (١- البقرة- ١٧٦, ٢٥)

The following Qoranic Verses indicate that heart i.e. blood circulation is connected with ears & eyes:

إِنَّ فِي ذَلِكَ لَذِكْرٍ لِّمَن كَانَ لَهُ قَلْبٌ أَوْ أَلْقَى السَّمْعَ وَهُوَ شَهِيدٌ ۝ (٢٦- ق- ٣٧) قُلْ أَرَأَيْتُمْ إِنْ أَخَذَ  
اللَّهُ سَمْعَكُمْ وَابْصَارَكُمْ وَخَتَمَ عَلَى قُلُوبِكُمْ... ۝ (٧- الانعام- ٤٦) إِنَّ السَّمْعَ وَالْبَصَرَ وَالْفُؤَادَ كُلُّ أُولَئِكَ  
كَانَ عَنْهُ مُنْتَزِلًا ۝ (١٥- بقر- ٣٦) وَجَعَلْنَا لَكُمْ سَمْعًا وَابْصَارًا وَفِيهِ رُحْمٌ ۚ (٢٦- الاحقاف- ٢٦)  
مَنْكُورٌ لَهُمْ قُلُوبٌ يَعْقِلُونَ بِهَا ۚ وَإِنَّا نَسْمَعُونَ بِهَا ۚ فَأَنَّى لَا تَفْقَهُ الْفُؤَادُ لِقَافِ الْقُلُوبِ  
الَّتِي فِي الصُّرُورِ ۝ (١٧- الحج- ٤٦) وَجَعَلَ لَكُمُ السَّمْعَ وَالْأَبْصَارَ وَالْأَفْئِدَةَ ۚ... ۝ (٢١- السجدة- ٢٣)  
وَهُوَ الَّذِي أَنشَأَ لَكُمُ السَّمْعَ وَالْأَبْصَارَ وَالْأَفْئِدَةَ ۚ... ۝ (١٨- المؤمنون- ٧٨) (١- البقرة- ٧)

\*when passage to internal ear is blocked, sound waves may not influence the internal ear & therefore, no hearing ... (١- البقرة- ١٩)

\*\*No functional tounge i.e. speechless.

\*\*\*This verse indicates that Brain is interlinked to ears, eyes & tounge

Nervous System ... contd...

Apart from Ears & Eyes, there Nose, Tounge, Skin & Teeth which are linked with the Nervous System i.e. Brain and the Blood Circulatory System i.e. Heart.

حَتَّىٰ إِذَا مَا جَاءَهُمْ شَيْءٌ مِّنْهُم سَمِعُوهٗ أَوْ أَبْصَرُوهٗ وَجُلُّوْهُ بِمَا كَانُوا يَفْعَلُوْنَ ۝  
وَقَالُوا لَیْجُودُ بِهِ شَيْءٌ لَّٰمَ عَلَيْنَا ۚ قَالُوا آنَظُنُّا ٱللَّهَ الَّذِیْٓ أَنطَقَ كُلَّ شَیْءٍ ۖ ۝ وَمَا كُنْتُمْ  
تَسْتَبْرِئُوْنَ ۚ إِنَّ یَسْهَوَ عَنْكُمۡ سَمْعُكُمۡ وَلَا أَبْصَارُكُمۡ وَلَا جُلُودُكُمۡ ۚ ۝ (24- حَم- 22-20)  
كُلَّمَا نَضَجَتْ جُلُودُهُمْ بَدَّلْنَاهُمْ جُلُودًا غَیْرَهَا ۖ ۝ (5- النساء- 56) بَلِ ٱلْإِنْسَانُ عَلَىٰ نَفْسِهِ  
بَصِیْرٌ ۚ ۝ لَا تُحَرِّكۡ بِهِۦ لِسَانَكَ لِتَجْعَلَٰ بِهٖ ۝ (29- القیمة- 16/14) لَوَ ٱحَدَ ٱلْبَشَرَةُ (مُنْضَر)  
أَلَمۡ نَجْعَلۡ لَهُۥ عَیْنَیْنِی ۚ وَ لِسَانًا وَ شَفَتَیْنِ ۚ (30- البلد- 8,9) صُمُّ یَكُمۡ عَمَّا فُتِمۡ لَا  
یَرْحِعُونَ ۚ (1- البقرة- 18)

The following Qoranic Verse indicates that Ears & Eyes are directly connected to both; Heart & Brain. If Allah The Almighty turns Ears & Eyes functionless, Heart & Brain may not be influenced through them:

وَلَا یَسْمَعُ الصَّۤءَ ٱلَّذِیۤ ٱدَّأٰ مَا یُنۢذِرُ ۚ ۝ (17- الانبیاء- 45) أَفَرَأَیْتَ مَنِ ٱتَّخَذَ ٱللَّهُ هَوَاهُ ۖ  
وَخَتَمَ عَلَىٰ سَمْعِهِۦ وَ قَلْبِهِۦ وَ جَعَلَٰ عَلَىٰ بَصَرِهِۦ عِشۜوَةً ۚ ۝ (25- الجاثیة- 23) وَمَا خَلَقَ ٱلَّذِیۤ ٱكۜرَرُوْا  
ٱلْأُنۢثٰی ۚ (30- الیل- 3)

### Reproductive System:

Qoran says that each life has male & female reproductive system:

كُلٌّ نَّاحِیَةٌ رَّوۡجِبۜنَ ۚ (27- الرحمن- 62) وَإِذَا ٱلنُّفُوسُ زُرَّتۜمۡ ۚ (30- التکوین- 67)

### MALE REPRODUCTIVE SYSTEM:

There is indication of existence of a pair of testis, situated between chest & back in human body and produces sperms, which 'jump' during movements:

مَلَبۜظِرۜ ٱلْإِنۢسَانُ بِمَآ خُلِقَ ۚ خُلِقَ مِنۢ مَّآءٍ ذَٰنِبِی ۚ لَا یَخۜرُجُ مِنۢ بَیۜتِیۤ ٱلصُّلُبِ وَٱلتَّرَآءِیۤ ۚ (30- الطارق- 5-7)

FEMALE REPRODUCTIVE SYSTEM:

Allah The Almighty created the opposite sex of Adam, having Female Reproductive System:

هُوَ الَّذِي خَلَقَكُمْ مِنْ نَفْسٍ وَاحِدَةٍ وَجَعَلَ مِنْهَا زَوْجَهَا ۝ (٩. الاعراف ١٨٩ ٢٣٦-الزمر-٦)

The following Qoranic Verse indicates that female contains a reproductive system, the woman loses fertility when system becomes functionless:

قَالَ رَبِّ اَنِّىْ يَكُوْنُ لِىْ غُلَامٌ ۚ فَقَدْ بَلَغَنِى الْبَيْزُ وَامْرَاَتِىْ عَاقِرٌ ۝ (٣-١١ عمرن-٤٥)

The female contains uterus, a very important organ of female reproductive system, when male & female sexual fluids discharge and unite to form zygote. Zygote ultimately develops to fetus:

يَخْلُقُكُمْ فِي بُطُونِ اُمَّهَاتِكُمْ خَلْقًا مِّنْ يَّعْدِ خَلْقٍ فِي ظُلُمَاتٍ ثَلَاثٌ ۝ (٢٣-١١ الزمر-٦)  
اَلَمْ نَخْلُقْكُمْ مِنْ مَّاءٍ مُّهِينٍ ۚ فَجَعَلْنَاهُ فِي قَرَارٍ مُّكَيِّدٍ ۚ اِلَىٰ اُنْفُسٍ مُّكْوَنَةٍ ۚ (٢٩-١١ المرسلات-٢٥)

The next continued 3rd chapter contains the scientific aspects of food, digestive system, digestion of food & formation of blood and blood circulation.



## CHAPTER THREE

### THE FOOD: ... contd...

The scientists agree with the Qoranic sayings that 'food' is one of the prime basic needs. Next to food are 'shelter' and 'clothes'.

Scientists also agree the Qoranic sayings that 'plants are basic source of food' for all the living creature including human. On the basis of eating habit, animals are of three types: i) Herbivorous: like cow, deer & grasshopper, which only eat plant and its products. ii) Carnivorous: Lion & Tiger, which only eat the flesh and iii) Omnivorous: like human & dog etc. which eat plants and animals both.

In this way, the scientists observe that deer eats the plants and lion eats the deer, it means lion indirectly eats the plant/grass. Therefore, it is wise to say that "all flesh are grass".

The Qoranic contents mentioned in the previous sub-chapters one to five, regarding the 'basic needs', 'sources of food' i.e. plants, animals, birds/insect & fish etc. are absolutely true and scientists have nothing new to mention.

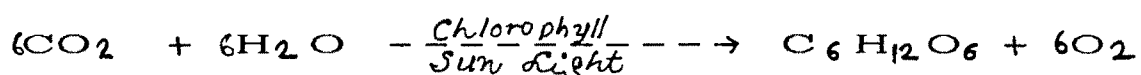
Scientists have observed that there are certain constituents, which constitute the 'food'. These constituents are:

- 1) Carbohydrates
- 2) Fats
- 3) Proteins
- 4) Water & Minerals
- 5) Vitamins

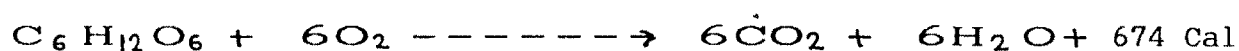
Food containing the appropriate quantity of carbohydrate, fats, protein, water & minerals & vitamins, is termed as balanced diet.

The Food ... contd...

**Carbohydrates\***: Scientists have established that the green plants are only the source of food. The green plants synthesise 'Carbohydrates' in the presence of Chlorophylls and Sun-light by way of 'Photosynthesis':



Carbohydrates are the energy supply nutrient. When broken down during 'Respiration', release 'energy':



Carbohydrates are of 3 types: i) Mono Saccharides, ii) Di-Saccharides and iii) Poly-Saccharides.

**MONO SACCHARIDES**: or simple sugar. Mono Saccharides are simplest forms of Carbohydrates with 3 to 6 carbon atoms per molecule of mono-saccharide. Mono Saccharides are of two types: I) Hexose and II) Pentose.

**HEXOSE**: Hexose contains 6 carbon atoms, like: D-Glucose or grape sugar, D-Glactose, D-Mannose & D-Fructose or fruit sugar. Hexose molecular formula is ' $\text{C}_6\text{H}_{12}\text{O}_6$ '.

**PENTOSE**: contains 5 carbon atoms, like D-Ribose. Its molecular formula is ' $\text{C}_5\text{H}_{10}\text{O}_5$ '.

Glucose is found in grape in free state. Glucose is found in combined form in starch, glycogen and several di-saccharides like Lactose & Sucrose. Pentose is found in the nucleus of cell and is one of the components of Nucleic Acid. Ribose is sugar found in RNA & De-Oxy Ribose is found in DNA.

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\* وَ مِنْ ثَمَرَاتِ الشَّجَرِ وَالْأَعْنَابِ نَخِذٌ مِنْهُ سَكَّرَ رِزْقًا حَسَنًا إِنَّ فِي ذَلِكَ لَآيَاتٍ لِّقَوْمٍ يَعْقِلُونَ (١٤- السجدة- ٦٧)

The Food ... contd...

DI-SACCHARIDES: or double sugar. When two mono-saccharides join together, di-saccharides are formed. These are:

- 1) SUCROSE: or table sugar, obtained from sugar beet & cane. One molecule of Glucose & one molecule of fructose, join to form one molecule of Sucrose. Its molecular formula is  $C_6H_{12}O_6$ .
- 2) MALTOSE: One molecule of Glucose unites with another molecule of Glucose to form one molecule of Maltose. Its molecular formula is  $C_{12}H_{22}O_{11}$ .
- 3) LACTOSE: One molecule of Galactose unites with one molecule of Glucose to form one molecule of Lactose. Its molecular formula is  $C_{12}H_{22}O_{11}$ , and found in milk.
- 4) RAFFINOSE: Raffinose is a tri-saccharide sugar, extracted from Raphin Palm and form needle like crystals, usually of Calcium-Oxalate.

POLY SACCHARIDES: When more than two molecules unite together, Poly-Saccharides are formed. Starch, Glycogen & Cellulose are Poly-Saccharides.

- 1) STARCH: Starch consists of two 'polymers\*'; i) Amylose: consists of long, unbranched chains of several hundreds glucose units, & ii) Amylopectin: consists of glucose polymers with branching chain.

Starch grains are completely insoluble in water, but moist & heat cause them swell and then become soluble and used as an 'energy-store' in plant cell. Starch is found in Rice, Potato & Wheat etc while animal starch is found in liver & muscles.

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\*Polymers are long branched chains of Glucose molecules

Carbohydrates ... contd...

- 2) GLYCOGEN: Glycogen is animal starch i.e. polymers in animals, equivalent to starch. Glycogen is made up of about 3000 to 6000, Glucose units with branching chains of 12-18 units each. The richest sources of Glycogen are live & shell fish.

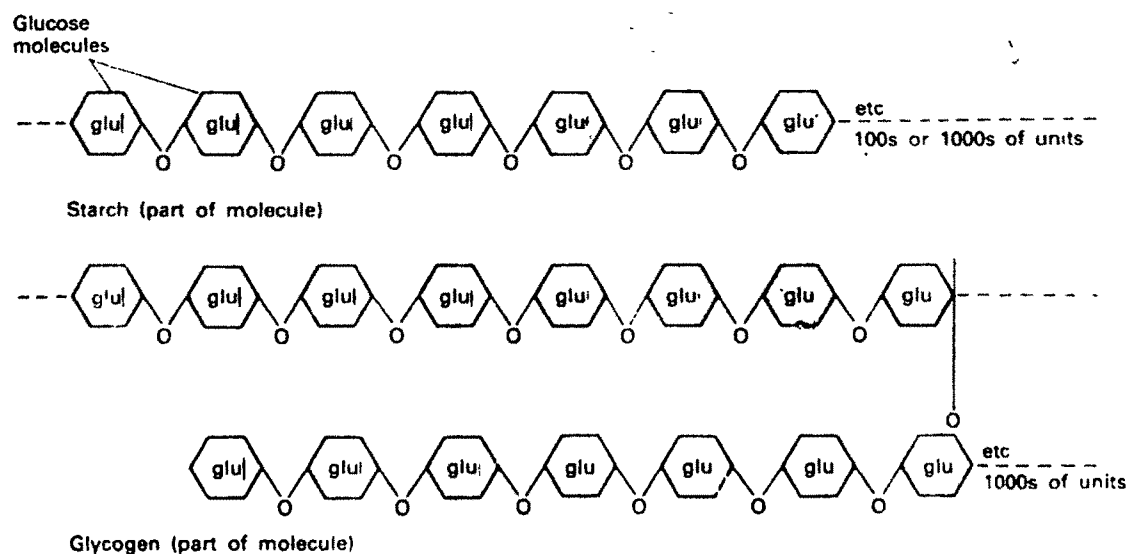


Fig. Examples of polysaccharides

- 2) CELLULOSE: Cellulose is like starch found in the plants. Cellulose is deposited outside the cell membrane. Cellulose is difficult to digest, because of hydrolysis of cellulose is prevented by 'enzymes' in digestive tract.

Fats & Oil: Fats are energy yielding food. Fats & oils are neutral and made up of C, H & O elements. Fat is not soluble in water. Plant fat is un-saturated, while animal fat is saturated. Saturated fat is solid while unsaturated are liquid at room temperature. Digestion of 1gm fat supplies 9 kcal energy.

Fats & Oils are made up of Glycerol & Fatty Acid:

Glycerol + Fatty Acid ----> Tri-Glycerides (Fats)

\* وَمِنَ الْبَقَرِ وَالْغَنَمِ حَرِّشْنَا عَلَيْهِمُ شُحُومَهُمَا إِلَّا مَا حَمَلَتْ ظُهُورُهُمَا أَوِ الْحَوَايَا أَوْ مَا كُنْتُمْ بِغُلُوبِهِمْ يَعْقِلُونَ (8- الانعام - 146)

\*\* over to pg/156 base

Fats & Oils ... contd...

TYPES OF FATS:

- 1) Tri-Glycerides: Tri-Glycerides is the most important fats, made up of 3 molecules of Glycerol combined with 3 molecule of Fatty Acid.
- 2) Phospholipids: Phospholipids is an important fats that includes Lecithins, incorporates in all membrane, e.g. egg yolk, which contains Stearic Acid, Oleic Acid & phsophate/Choline. The main components of Phospholipids are Fatty Acid, Glycero Phosphate & Serine.
- 3) Sterols: Sterols include, i) Cholestrol & ii) Bile Salts.
  - i) Cholestrol is a lipid\* rather than fat. It is found in all foods of animal origin, particularly in eggs. Cholestrol is helpful in the synthesis of our cell membrane, sex-hormones & Adrenal hormones. Waxy cholestrol blocks the blood vessels.
  - ii) Bile Salts play an important role in the digestion of fats.

Fats carry the fat-soluble vitamins like; A, D, E & K.

TYPES OF FATTY ACID:

- 1) Palmitic Acid: Palmitic Acid is saturated fatty acid found in Palm tree.
- 2) Stearic Acid: Stearic Acid is a saturated fatty acid found in Beefs.
- 3) Linolanic Acid: Linolanic Acid is un-saturated fatty acid found in vegetable oils.

---

\*Lipids are fats belong to wide group of chemicals e.g. cholestrol & waxes.

The Food ... contd...

**Proteins**: Protein is body building & body repairing substances, also supplies energy. Protein is a macro molecule, containing C, H, O, N and some times S. Cell membrane, hair, nails & muscles are made of proteins. All 'Enzymes' & 'Antibodies' are very important proteins, help in chemical reactions. Protein molecule is a long chain of 'Amino Acid' i.e. Amino Acid is an 'unit' of Protein, connected with 'Peptide' links.

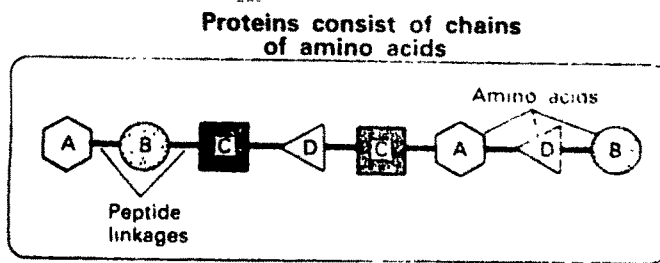
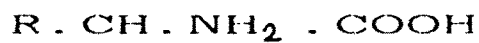


Fig. Amino-acids and peptide linkage

Essential	Non-essential
Isoleucine	Alanine
Leucine	Arginine
Lysine	Aspartic acid
Methionine	Asparagine
Phenylalanine	Cysteine
Threonine	Glutamic acid
Tryptophan	Glycine
Valine	Histidine
	Hydroxyproline
	Proline
	Serine
	Tyrosine

Fig. Amino-acids that make up proteins

#### General Formula of Protein:



where 'R' is a variable

'NH<sub>2</sub>' is Amino Group of Basic properties

'COOH' is Carboxyl Group of Acidic properties

Glycine, Alanine, Valine, Serine, Lysine, Ornithine & Cysteine are some important proteins.

About nine 'amino acids' are essential in our diet. Meat i.e. animal flesh contains all these amino acids, while plants does not have all amino acids. Our body cannot synthesise Amino Acid.

\* وَهُوَ الَّذِي سَخَّرَ الْبَحْرَ لَنَا طَرِيقًا ۖ لَعَلَّآ نَأْكُلُ مِنْهُ لَحْمًا طَرِيقًا ۚ ۝ (النحل-14) اللَّهُ الَّذِي  
 جَعَلَ لَكُمُ الْآلَانَامَ يَتَرَكِبُونَ مِنْهَا وَيَتَرَكِبُونَ هِيَ (24- المؤمن-79)  
 وَسَجَرَةً تَخْرُجُ مِنْ طَوْرِ سَيْنَاءَ تَنْبُتُ بِالذَّهْنِ وَرَمِيحٍ لِلْأَكْبِينِ\*  
 (18- المؤمنون-20)

The Food ... contd...

**Water & Minerals\***: Water & Mineralas are the important food constituents.

**WATER:** Water has very remarkable properties of biological importance. It is liquid at ordinary temprature. Water is the most important food constituents and 70% body weight is due to water. A man may not survive more than two days under extreme temprature/climate, and about 18 days under humidity/moderate temprature without water. While starvation\*\*limit is 30 days.

Water has high Specific Heat in comparision to the other. This property leads to large change in temprature due to the heat produced during chemical reactions in the cells.

Water is obtained from three sources:

- 1) About 500 ml water per day is derived from 'Cellular Oxidation' process in our body. Desert Kangro Rat depends only on the cellular oxidised water.
- 2) Greater portion of water intake is derived from fruits, vegetable and other food contents.
- 3) Water is taken as raw drinking water.

Water also has high Latent Heat of Evaporation - provide the basis for an efficient mechanism of 'sweating'. Water is good solvent for 'ionic' compound.

Excess of dehydration makes blood thick, tounge swells and kidney fails. 20% loss of water from human body due to dehydration may cause death. Human needs 1500 ml to 2000 ml water daily.

وَمَا يَشْتَرُونَ بِهِ ثَمَرًا مَّا يَكْفِيهِمْ شَرَابُهُمْ وَهُمْ يَخْلَطُونَ بِهَا مَاءً (22- فاطر)

\*\*When no food & no water is available.

Water & Minerals ... contd...

MINERALS: The following elements are essential for our body. They are taken in the form of our food.

SODIUM: or Na is a major 'cation' of extracellular\* fluid. The normal dietary requirement of Sodium is 20 mmol, unless sweating occurs otherwise 70 to 350 mmol.

Sodium is essential for our survival, because it regulates the pH of our tissue fluids, their osmotic pressure & their water-salt balance. Sodium is found in cheese, eggs, calf liver, tomato & orange.

POTASSIUM: or K is major 'Intracellular'\*\* CATION and normally presents in low concentration in Extracellular fluid. Potassium deficiencies occurs due to vomiting, diarrhoea & excess urination, which causes muscular (cardiac) weakness and mental confusion. Nuts, fruits & beefs are moderate sources of K. Potassium is also found in potato crisps, dry dates, calf liver, banana, cooked spinach, salted bread, orange, milk, boiled egg & apple.

IRON: or Fe is a component of haemoglobin, myoglobin, cytochromes & several enzymes; like, 'cytochrome oxidase'. The Iron content of an adult is 3-4 g of which 1 g can be stored as 'Ferritin' in Liver, Spleen & Bone Marrow.

Iron is lost through faeces, urine, sweat, hair, menses, bile & cells lining the intestine. Cereals/flour supplies the largest proportions of Iron intake. Meat contains 28%, while vegetables contain 18%, out of which potato is the richest source of Iron.

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\*Extracellular means outside the cell compartment, has more Na & Cl

\*\*Intracellular means inside the cell compartment, has more K & P



Water & Minerals ... contd...

PHOSPHORUS: or P is needed to produce bones & teeth. Phosphorus is also found in blood & tissues, and one of the constituents of Nucleic Acid. All the cell membranes have phosphorus in the form of 'Phospho-lipids'.

Dairy products, meat, poultry & fish are the major sources of Phosphorus. Phosphorus is also found in dry bean, peas, nuts, flour, cereals, cheese, liver, kidney & fruits.

SULPHUR & CHLORINE: S & Cl ; Sulphur is found in Proteins, and Chlorine is taken in the form of Sodium Chloride or table salt.

MAGNECIUM: or Mg is found in bones & soft tissues like liver & muscles. Magnesium is used as 'enzyme activator' of energy liberating sequences i.e. during internal 'respiration'.

Wheat, Bran, Cocoa, Wheat Germ, Peanuts, Brewer's Yeast, Chocolate and Soyabeans are sources of Magnesium.

IODINE: or I is found in water and Sea-weeds. Its deficiency causes 'Goitre'. Now a days Iodine is added to table salts in order to avoid the deficiency. Baby's mental & physical developments retard, if pregnant mother lacks Iodine in her diet.

Iodine is also required to synthesise Thyroid Hormone, 'Thyroxine'. The lack of Thyroxin causes 'Goitre'.

Cabbage & Turnip contain anti thyroid compound called 'Goitrogens'. Therefore, excess use of cabbage & turnip may cause 'goitre'.

FLUORINE: or F is useful to defend tooth enamel against decay. Fluorine deficiency causes 'fluorosis'.

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The Food ... contd...

**Vitamins\***: or Vital Amines are organic substances, which are not adequately synthesised by the body, yet are essential in small 'catalyte' amount, for the functioning of the Chemistry of Cells. Some vitamins are synthesised in the Intestine by Bacteria/ bacterial Flora.

TYPES OF VITAMINS: Vitamins are of two types:

- a) Fat soluble vitamins like; A, D, E & K.
- b) Water soluble vitamins like; B & C.

VITAMIN A: Vitamin A is also called as 'Retinol', and its precursor is called as 'Carotene'. Retinol is found Fish/Shark Liver Oil, which is the richest natural source of vit. A, Green Vegetables, Red Fruits & Vegetables (Carrots), Butter, Cheese, Eggs, Spinach, Tomato & Maize.

Vitamin A is essential for vision in dim light, involved in the maintenance of 'Epithelial' surfaces, development of 'skeleton', including skull & vertebral column.

Vitamin 'A' is destroyed by oxidation, when the fat/host of vit. A, turns rancid or exposed to UVR or heated to air. To prevent the loss of vit. A, 'anti-oxidant' or preservative is added to fatty/oily food.

Animals obtain Retinol by eating plants/animals. Plants do not contain vit. A, instead contain 'Precursor Carotene'. From Carotene, animals form Retinol in Guts & Livers.

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\* اُنْظُرُوا إِلَى ثَمَرَةٍ إِذَا آثَمَرُوا يَنْبُؤُهُمْ هـ ( ٧ - الْإِنْعَام - ٩٩ )

Vitamins ... contd...

VITAMIN D: or 'Calciferol', which is of two types: i) D or Ergo-Calciferol & ii) D or Chole Calciferol. 'Ergo-Sterol' is vit. 'D' 'precursor' in plants, while 'Cholestrol' is vit. 'D' 'precursor' in animals. These animals & plants 'precursors' are converted to vit. D, when exposed to sun light/UVR.

Vit. D is essential for bone formation and promotes the absorption of Calcium & Phosphate by small intestine. Also promotes the Phosphate absorption by kidney. Vit. D itself is absorbed by intestine together with fats.

Vit. D is obtained from Fish/Shark Liver Oil, Eggs, Liver, Oil, Butter and also from sun-rays, when ultra violet rays reacts with 7-dehydro cholestrol found in human skin. Rickets, deformation & softness of bones cause due to lack of vit. D supply in children, while in adults, the same condition is termed as 'Osteomalacia'.

VITAMIN E: or Tocopherol prevents cell damage i.e. prevents destructive Oxidation of Polysaturated Fatty Acids in cell membrane. Vit. E itself is destroyed by UVR & Oxidation, but not by the cooking.

\*

Being an 'Anti-oxidant', Vit. E prevents oxidations of Fatty Acid, Vit A & Vit C in food & Body.

Vit E is found in vegeable oils, wheat germs, sun-flower seeds, dark green vegetables, fats & mother's milk & not the cow milk. Vit E prevents fats & oil to turn bad/rancid.

Deficiency causes death of fetus in mother's womb & 'sterlity' in males.

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\*Vit E takes up Oxygen to prevent vitamins from oxidation, is termed as 'anti-oxidant'.

Vitamins ... contd...

VITAMINS K: 50% of vit K is synthesised by Bacteria in Intestine & large bowel and rest 50% is obtained from food. Vit K is important to synthesise 'Prothrombin' in liver and regulates synthesis of blood clotting factors, like prothrombin. Consumption of 'Anti-biotic' medicines destroy the bacteria synthesising vit K in the intestine. Vit K is available in fresh, green & leafy vegetables/spinach. Vit K is also found in milk, eggs, liver, brain, tomato & potato. Deficiency of vit K causes lack of blood 'clotting'.

Now let me take the water soluble vitamins one by one:

VITAMIN B: Vitamin B is a complex of the following vitamins:

1) Thiamine or B<sub>1</sub>, 2) Riboflavin or B<sub>2</sub>, 3) Niacin or B<sub>3</sub>, 4) Pridoxin or B<sub>6</sub>, 5) Cyanocobalamin or B<sub>12</sub> & 6) Folic Acid.

THIAMINE OR B<sub>1</sub>: The Pyro Phosphate Thiamine is a Carboxylase enzyme, which is involved in the de-carboxylation of 'Pyruvic Acid' i.e. Carbohydrates breakdown. Those cell like of brain, having specific amount of Carbohydrate/glucose requirements, will lack Vit B<sub>1</sub>...

Vit B<sub>1</sub> is found in seeds, e.g. germs of cereals, nuts, peas & beans. Also in Yeast, Bacon, liver, cornflakes, bread, eggs, spinach, fish and milk. Lackness of Vit B<sub>1</sub> causes Beri-Beri & mental anxiety.

RIBOFLAVIN or B<sub>2</sub>: Riboflavin is necessary for normal growth. Riboflavin is a component of active 'flavo-proteins', capable of reversible oxidation/reduction reactions.

Riboflavin is available in liver, milk, eggs, green vegetables, yeast, chickens, spinach & fish. Lack of B<sub>2</sub> causes 'dermatitis, hair-loss, conjunctivitis. The corners of mouth cracks due to lack of Vit B<sub>2</sub>.

Vitamins ... contd...

NIACIN or B<sub>3</sub>: is also called as Nicotinic Acid, which is a component of co-enzymes 'NAD' & 'NADP'. These are concerned with the tissues oxidation. Deficiency of Niacin causes rough skin and lips and tongue become sore. Niacin is found in Meat, Milk, Fish & Whole-meal Cereals. Niacin or vit:B<sub>3</sub> is synthesised in man from 'Tryptophan', which is an amino acid 'precursor' found in the body tissues. Niacin is also synthesised in the intestine by Bacteria.

Niacin is also found in hard oily seeds, green & leafy vegetables, almond, yeast, soyabean, chickens, lambs & eggs.

PYRIDOXIN or B<sub>6</sub>: Pyridoxin is important in the synthesis of 'Haemoglobin'. Pyridoxin is found in Liver, Meat & Bran.

Pyridoxin is sensitive to light but insensitive to heat. Its deficiency causes 'Anaemia'.

CYANOCOBALAMIN or B<sub>12</sub>: Cyanocobalamin is necessary for DNA synthesis. Those cells dividing rapidly, are most affected by Cyanocobalamin, e.g. Bone Marrow, G.I. Tract & Blood formation. It is also useful in the maintenance of 'Myelin' in the Nervous System.

Vit B<sub>12</sub> is found in Liver, Meat, Milk & Milk products. Lack of B<sub>12</sub> causes Megaloblastic Anaemia. Vit B<sub>12</sub> is not found in plant, but stores in human body.

FOLIC ACID: It is an acid in Vit. B-complex, termed as 'Folacin'. Folic Acid is important for the transfer of one-carbon unit. It receives one-carbon radical from Glycine & Tryptophan etc. & donate in the synthesis of 'Purine', 'Pyrimidines' & blood formation.

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\*Pellagra disease

Vitamins ... Folic Acid ... contd...

Folic Acid is found in the Liver of Ox, Oysters, Spinach & Orange juice.

Lack of Folic Acid causes Mega Loblastic Anaemia. Pteric Acid is an original Folic Acid found in Spinach. Pteroyl Glutamic Acid is also Folic Acid, therapeutically active in Pernicious/destructive Anaemia.

PANTOTHENIC ACID is also considered a member of Vitamin B-Complex.

BIOTIN is considered as Vitamin 'H', which forms part of several enzyme system, e.g. incorporation of  $\text{CO}_2$  from  $\text{HCO}_3^-$  into path-way of Fatty Acid synthesis & formation of Oxalo Acetate from Pyruvate, Glucose formation from Pyruvate.

Biotin is found in Liver, Kidney & Yeast. Large bowel bacteria synthesises Biotin.

Avidin, a protein found in eggs, can render the Biotin unavailable, causes 'Dermatitis'.

Fat soluble vitamins are not destroyed during cooking. Remains within body and are not excreted out. These vitamins are poorly absorbed if mineral oil is present in the intestine. Therefore, intake of mineral oil be avoided before meal. These vitamins are more easily absorbed when fat & oil are present in the Gut. In Jaundice poor fat absorption causes poor intake of these vitamins.

Water soluble vitamins are excreted out and do not store in the body. Destroyed during cooking (transfer to cooking water on warming).

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Vitamins ... contd...

ASCORBIC ACID or C: Vitamin C is necessary for the formation of intercellular ground substance that binds cells in bone, teeth & connective tissues. Vit C contributes to 'Hydroxyproline' formation, which is an amino acid and forms 13% of 'Collagen'. Collagen\* is a component of ground substance. Vit C also helps the formation of RBC

Vit C is found in Citrus fruits, currants\*\*, fruits of Berry group plants, Tomato, Green chilly, Spinach, Cabbage, Lemon, Amla, Peas & Banana.

The first sub chapter of this chapter contains the scientific details of different organs of human digestive system.

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\*A type of Protein.

\*\*Dried type of Grape

## sub chapter i

### Digestion of Food:

There is a system within the human body, which is responsible to convert the food into 'blood', and passes out the non-converted in the form of faeces. During the process of conversion or digestion, the system gets help from 'Pancreas' & 'Liver' etc. The digested food is assimilated into the Blood Circulatory System.

The main parts of the Digestive Sytem are:

- 1) Mouth & Oesophagus
- 2) Stomach
- 3) Duodenum
- 4) Small Intestine
- 5) Large Intestine

**Mouth & Oesophagus:** Mouth is the first part of digestive system. It is also called as Buccal Cavity or Oral Cavity, which contains 32 teeth in upper & lower sets of 16 each i.e. 4 incisors, help in cutting, 2 cannines, help in tearing, 4 premolars & 4 molars, help in masticating the food. While 'Tounge' helps to observe the taste & rotates food to mix the sliva. The crushing force of incisors & molars are 14-36kg & 45-86kg respectively.

SALIVARY GLAND: Tounge bears three pairs of salivary gland; i) Sub-mandibular/sub-maxillary, ii) Parotid & iii) Sub-lingual. Some additional glands like; Labial, beneath the tips, Palatine, beneath the palate, Lingual, beneath the tounge & Buccal beneath the oral mucous membrane of cheeks, contribute almost 1 litre of saliva per day.



Mouth & Oesophagus ... contd...

Saliva is of two types; i) Mucous - thick & ii) Serous - watery.

Saliva contains two types of enzymes; i) Amylase & ii) Lipase.

Lipase is important at neonate when pancreatic enzymes are inadequate.

FUNCTIONS OF SALIVA:

-General cleansing & protection of masticatory apparatus,

-Hydrolysis of Polysaccharides, like Glycogen & Starch.

Salivary Amylase 'Ptyalin', an enzyme with pH 6.9, splits the linkage of 'Polysaccharides' molecules. Amylolytic activity continues 15-30 minutes, during which considerable Polysaccharides breakdown occurs, before strong acid & 'Pepsin' destroy 'Amylase' in the stomach, where 'fundic' region acts as quiescent food reservoir.

About 75% starch\* from potato & 60% from bread may be converted to 'Maltose', before enzyme becomes inactivated. Glucose & Alcohol are absorbed in blood stream through epithelium of the cavity.

-dissolves 'sapid' substances & making them available for taste.

Taste buds are modified Epithelial Cells. For sweet - tips, for sour lateral region, for salt - entire surface & for bitter - posterior surface of the tongue is responsible.

**Oesophagus:** Mouth leads to oesophagus, which a hollow muscular tube/Gullet, normally kept empty by waves of 'constriction' passing along its length to the stomach - 'Peristaltic Waves'.

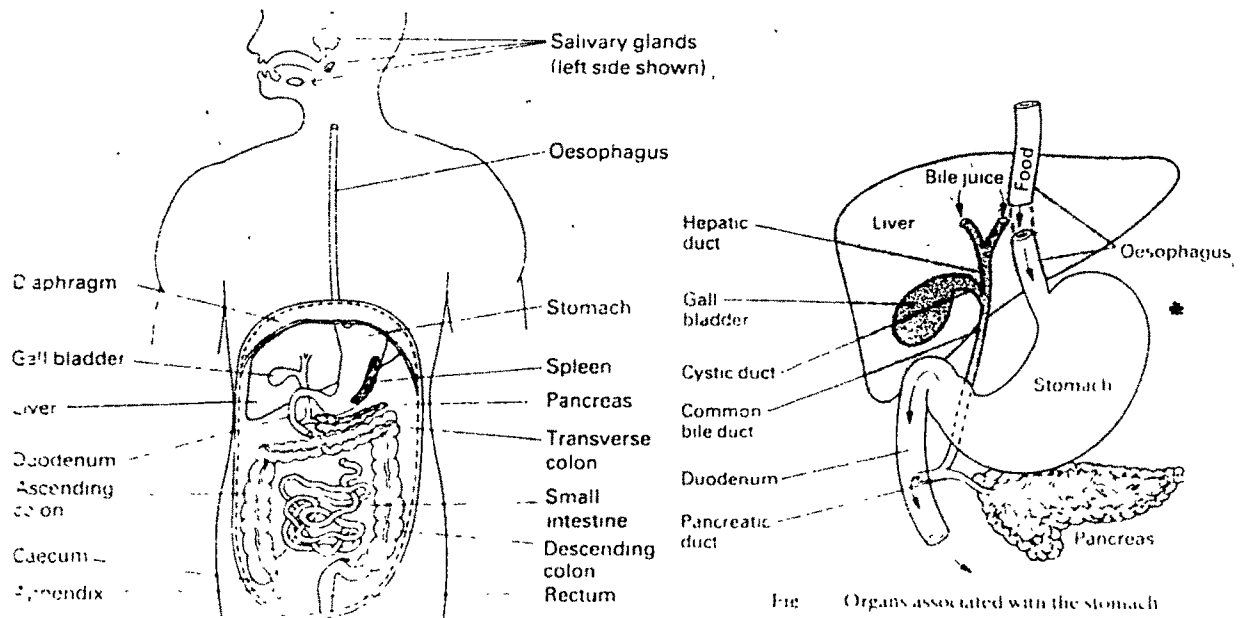
In oesophagus, two layers of muscles are observed separated by a Nerve Net-work. The outer is longitudinal & inner is circular muscles.

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\*starch broken into smaller units are termed as 'Dextrins'

Digestion of Food ... contd...

**Stomach:** The Oesophagus leads to the 'Stomach', which receives & stores temporarily the ingested food. Acid & Enzymes secrete into its 'Lumen'. Muscular contractions result the contents of stomach being mixed, partially digested & emptied into the 'Duodenum'. Thus, stomach produces 'Chyme'; uniform in pH, osmolity & temprature.



The entire unicosal surface of stomach is covered by columnar epithelial cells, secreting an 'alkaline' fluid with mucous. There are also peptic cells, secreting 'Pepsinogen' & Proteolytic Enzymes. A third Oxyntic/parietal cells secreting 'HCl'.

CARDIAC GLANDS: found in Oesophagus, composed of almost entirely mucous secretion, while PYLORIC GLAND secretes 'Pepsinogens' with mucous.

The stomach is divisible into 3 regions; i) upper 'Fundic', ii) middle 'Body' & iii) lower 'Pyloric'.

\* وَإِنَّ لَكُمْ فِي الْأَنْعَامِ لَعِبْرَةً ۖ نُسَخِّبُكُمْ بِمَا فِي بُطُونِهِمْ مِنْ بَيْنِ فَرْثٍ وَدَمٍ لَبَنًا خَالِصًا سَائِغًا وَنَا لَكُمْ شَرِيبًا ۚ  
(14- النحل - 66)

Digestion of Food ... contd...

Stomach Walls: Stomach contains 3 layers of wall:

SEROSA: Outermost layer covers all abdominal organs, produces watery lubricating fluid.

MUSCULARIS: Consists of a longitudinal, a circular & an oblique layer.

SUB-MUCOSA: Sub-Mucosa is an 'aerolar' connective tissue.

MUCOSA: Made up of columnar epithelial cells, bearing Gastric Glands or pits. These pits contain 3 types of excretory cells:

a) Peptic Cells: secretes protein digesting enzyme 'Protease'.

Protease is produced as inactive 'Pepsinogen', which is converted to active 'Pepsin', when Acid & Protein are present in stomach.

b) Oxyntic Cells: secretes 'HCl' which creates necessary pH for Protein digestion. Gastric juice is an acidic solution i.e. pH=1.5 - 2.5.

c) Mucous Cells: secretes lubricating mucous, which protects stomach from 'Pepsin', otherwise there is chance of 'gastric ulcer'.

Mucous cells also produce 'Intrinsic Factor', which helps to absorb vit B from food. Pernicious Anaemia occurs in the absence of Intrinsic Factor or vit B<sub>12</sub>.

ATP is generated by 'Mitochondria' in response to the secretory-stimuli and translocated to secretory membrane, where it is 'hydrolysed'. The energy released is made available to a carrier, transporting 'Protons' out of cell against an electrochemical gradient.

#### ENZYMES IN GASTRIC JUICE:

a) Pepsin: Pepsin hydrolysing protein, is detected in gastric juice. Pepsin is released as inactive Pepsinogen. Pepsinogen becomes active Pepsin, when HCl mixes, and its pH value falls below 5.

Enzymes in Gastric Juices ... contd...

Several Peptids are cleaved from Pepsinogen molecules to produce 'enzyme'. Pepsin hydrolyse several Peptid Bonds within the interior of ingested Protein molecule to form Poly-peptides, but little Amino Acid. Pepsins have powerful milk-clotting activities; work as a substitute of 'Renin'. Renin is absent in human and found in calf's stomach.

- b) Lipase: Lipase is gastric juice enzyme works on 'Tri-Glycerides', i.e. short chain of fatty acid. Fatty Acid in the form of Tri-Buty-rin/Butyric Acid is found in Butter fat.
- c) Gelative: Gelative is also an enzyme of gastric juice, liquifies Gelatin.
- d) Intrinsic Factor: A protein found in gastric juice, helps in protection & absorption of vit B<sub>12</sub>, for which it passes along intestine and adheres to ileal epithelial cell/ileum.
- e) Insulin: Presence of intravenous insulin, stimulates gastric secretion. There are 3 phases; i) cephalic, ii) gastric & iii) intestinal for the inhibition as well as the stimulation of Acid & Pepsin release.

GASTRIC EMPTYING: The rate at which gastric contents pass into 'duodenum' depends on its Physical & Chemical properties:

- 1) Solid food remains in stomach longer than the liquid foods.
- 2) The greater volume of gastric contents, faster the rate of emptying.
- 3) The 'osmolality' of chyme entering in duodenum has a marked effect on subsequent gastric emptying.
- 4) The presence of fats & their digestive products in the upper small intestine inhibits gastric emptying.
- 5) Acid in upper small intestine delays gastric emptying.

Digestion of Food ... contd...

**Duodenum:** From stomach chyme is emptied into small-intestine, where secretions from Pancreas & Liver mix with the chyme. Duodenum connects the stomach with the small-intestine, where there are glands of 'Brunner'. These sub-mucosal glands secrete 'Brunner-Viscous Alkaline Fluid'. The Alkalinity is due to the presence of bi-carbonate ' $\text{HCO}_3^-$ '. Thus Brunner glands protect Duodenum from Ulceration. The Ulcer may cause due to action of Gastric Acid and Pepsin.

**Pancreas:** Human Pancreas is a large gland of about 20 cm, its head lying within the curve of Duodenum, where pancreatic secretion mixes with the food. Pancreatic Secretions are of two types:

i) A Digestive Juice & ii) Hormones.

DIGESTIVE JUICE: It is also termed as Pancreatic Juice. It contains 3 major enzymes; a) Amylase, b) Protease & c) Lipase. Pancreatic Juice is secreted in alkaline medium i.e. ' $\text{HCO}_3^-$ ' of pH 7.1 to 8.2.

HORMONES: Two hormones i) Insulin & ii) Glucagon are produced from Endocrine glandular area of Pancreas called 'Islet of Langerhens'. Islet contains two types of cells; i) Alpha: produces 'Glucagon'. Glucagon breaks Glycogen to yield 'Glucose'. ii) Beta: produces 'Insulin'. Insulin takes Glucose out of food & stores in the form of Glycogen.

COMPOSITION OF PANCREATIC JUICE: Pancreatic Juice contains two major components; i) Alkaline Fluid & ii) Enzymes.

ALKALINE FLUID: This fluid helps to neutralise Acid entering the Duodenum and provides medium where Pancreatic Enzymes can function well. There are major cations;  $\text{Na}^+$  &  $\text{K}^+$  and major anions  $\text{Cl}^-$  &  $\text{HCO}_3^-$ , found in the Alkaline Fluid.

Pancreas ... contd...

ENZYMES: There are following Enzymes found in Pancreatic Juice:

TRYPSIN: Trypsin's inactive form is Trypsinogen. Trypsin hydrolyses Peptide Bonds of Protein molecules.

CHYMOTRYPSIN: Inactive form of Chymotrypsin is Chymotrypsinogen. Its activation depends on 'Trypsin'. It also acts on Peptide Bonds to hydrolyse Protein.

CARBOXYLE PEPTIDASE: Carboxy Peptidase removes the Amino Acid with free Carboxyle Group from the end of Peptide bond. Carboxy Peptidase is produced from its 'Zymogen' by action of Trypsin.

PANCREATIC AMYLASE: Pancreatic Amylase forms Maltose & Malto-Triose from Amylose; the straight chain of Polysaccharides.

LIPOLYTIC ENZYMES: Lipolytic Enzymes break-down the 'lipids' found in Pancreatic Juice. This Pancreatic Lipase acts on water-insoluble Tri-Glycerides to release Fatty Acids & 2-mono Glycerides.

OTHER ENZYMES: Other enzymes partially hydrolyse Nucleic Acid to Mono Nucleotides i.e. Ribo Nuclease & De-Oxy Ribo Nuclease.

Liver: Liver<sup>\*</sup> is the largest gland of the body and has numerous functions. Liver is about 1.4 kg & situated beneath the diaphragm. Liver is divided into two lobes. Each lobe is further divided into smaller lobules.

Liver's each lobule is made of 'cord of hepatic' or liver cells, encircling a 'central vein'. Running between two rows of Hepatic cells are blood filled spaces called 'Sinusoids'. In Sinusoids, there are Phagocytic cells called 'Kupffer' cells. Kupffer cells destroy the old blood cells.

HEPATIC PORTAL VEIN brings the digested food from the Intestine to the Liver, while HEPATIC ARTERY brings oxygenated blood to liver.

\*Liver produces anticoagulant Heparin & clotting factor Protrombin.

Liver ... contd...

The blood from Hepatic Veins & Arteries flows through 'Sinusoids'. Liver takes out the 'toxic' food nutrients, de-toxify them, which again mixed to the blood.

Bile Juice made by Liver is stored within Gall Bladder. When fatty foods are in Intestine, Gall Bladder contracts to 'eject' Bile Juice to the Duodenum through cystic duct. In case of Jaundice, Liver swells and Bile Juice, instead of flowing to Duodenum, passes into the blood stream.

FUNCTIONS OF LIVER: Liver is responsible for: i) Carbohydrate Metabolism, ii) Protein Metabolism, iii) Fats Metabolism, iv) Handling of Vitamins & v) Secretion of Bile Juice.

CARBOHYDRATE METABOLISM: Liver plays central role in maintaining blood sugar level and is capable to introduce 'glucose' into the blood or removes the 'glucose' from the blood circulation, as per the requirements of our body. Liver also acts as 'storage tissues' for glucose/hexose in the form of 'glycogen' a polysaccharide. Again Glycogen is converted back to Glucose by way of 'Glycogenolysis'; a reverse process of 'Glycogenesis'. Glycogen is synthesised largely from 'Lactate', e.g. derived from muscle metabolism during exercise and other non-carbohydrate sources like Fatty Acid & Amino Acid.

PROTEIN METABOLISM: Liver is active in 3 areas of Protein Metabolism i) Protein synthesis, ii) Formation of Urea as the main Nitrogenous end product of Amino Acid Metabolism & iii) Inter-conversion of Amino Acids.

Many of plasma proteins are synthesised in Liver like; i) Albumin: which provides 'osmotic' pressure to the plasma, ii) Fibrinogen: which helps in blood coagulation, iii) Globulin: helps in the transportation of Fe, Cu & Fats, iv) Liver is important in the synthesis

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Liver ... contd... Function of Liver

and degradation of Protein & Amino Acid & v) Liver has all enzymes necessary for the production of Urea from Nitrogen, which is obtained as a result of Amino Acid Metabolism i.e. Krebs's Urea Cycle.

FAT METABOLISM: Liver has got important capabilities to handle the Metabolism of Fat:

- Liver plays important role in Bile Acid Metabolism.
- Liver removes 'Chylomicrons', which is formed due to the digestion & absorption of Fat and passes into the lymphatics.
- In Liver Tri-Glycerides are again hydrolysed and some of the released Fatty Acids are incorporated into Phospholipids & Cholesterol esters or used again for Triglycerides synthesis.
- Lipids synthesised in the Liver are released in association with 'apo-protein' - a protein fraction, as Lipo-Proteins.
- Some Fatty Acid is metabolised in Liver to provide energy.

HANDLING OF VITAMINS:

- Liver stores all fat soluble vitamins like; A, D, K & E and B<sub>12</sub> the water soluble vitamin.
- Liver contributes in the absorption of fat-soluble vitamins, like; Vitamin A, D, K & E, by Small Intestine.

SECRETION OF BILE JUICE:

Liver secretes Bile, which is a variable complex mixture of water & Organic & Inorganic Solutes. Major Organic Solutes contain: i) Bile-Acids, ii) Phospholipids, iii) Cholesterol, iv) Reddish Bile Rubin & v) Greenish Bile Verdin.

Electrolytes like; Na & K are found in same proportion, as in Plasma, while the concentration of major anions like; Cl & HCO are less than in Plasma.



Liver ... Bile Juice ... contd...

BILE ACIDS: Bile Acids are water soluble derivatives of 'Cholestrol'. Two primary Bile Acids; Cholic & Cheno Deoxy Cholic Acids are synthesised in Liver. 75% of Primary Bile Acids are un-altered, as they pass along the Small Intestine and are absorbed in distal region 'ileum' and return to liver via Portal Circulation. 25% of Bile Acids are de-conjugated by Bacteria.

FUNCTIONS OF BILE ACID:

- Bile Acid helps the digestion & absorption of Tri-Glycerides.
- Bile Acid helps in the mobility of 'colon'.
- Bile Acid regulates its own synthesis from 'Cholestrol'.
- Chenic Acid suppresses the synthesis of Hepatic Cholestrol.
- Bile Acid eliminates Cholestrol, as Cholestrol causes Artery disease
- 1g to 2g per day, Cholestrol is secreted by Liver.

BILE PIGMENTS:

Major pigment of Bile is 'Bile Rubin', by means of which 'Haem' is produced, during the break-down of Haemoglobin. Haem is later eliminated. Bile Rubin is produced mainly in 'Spleen', 'Bone-Marrow' & Liver. All Bile Rubin is not derived from Haemoglobin, 20% Bile Rubin is synthesised from Myoglobin & Cytochrome.

GALL BLADDER: Gall Bladder is a distensible bag of 30-50 ml capacity.

Its functions are:

- The concentration of Bile
- The delivery of Bile to Duodenum to aid digestion & absorption of Fats.

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Liver produces almost 700ml to 1200ml Bile Juice, daily

Digestion of Food ... contd...

**Small Intestine:** Duodenum leads to the Small Intestine, where most of the absorptive & secretory functions take place. Small Intestine also performs several complex movements.

**STRUCTURE OF SMALL INTESTINE:** Small Intestine is approximately 5m long extended between Duodenum & Large Intestine. It is divisible into three regions: i) Duodenum, ii) Jejunum & iii) Ileum.

Duodenum is almost 25cm long & curved tube, devoid of 'mesentery'\*. Starting point of Duodenum is 'Pylorus'. The wall of Duodenum contains mucous producing 'Brunner's Glands' and ducts pass through the glands so that the Pancreatic & Hepatic secretions can reach to the Intestinal Lumen.

Remained Small Intestine is a coiled tube attached to the posterior abdominal wall by Mesentery. 2/5th of the Intestine is Jejunum & rest is Ileum. Jejunum is thicker walled, more muscular & has larger 'Villai' than of Ileum.

In Duodenum Villai is broad, in Jejunum, leaf-like and in distal Jejunum & Ileum, Finger-like.

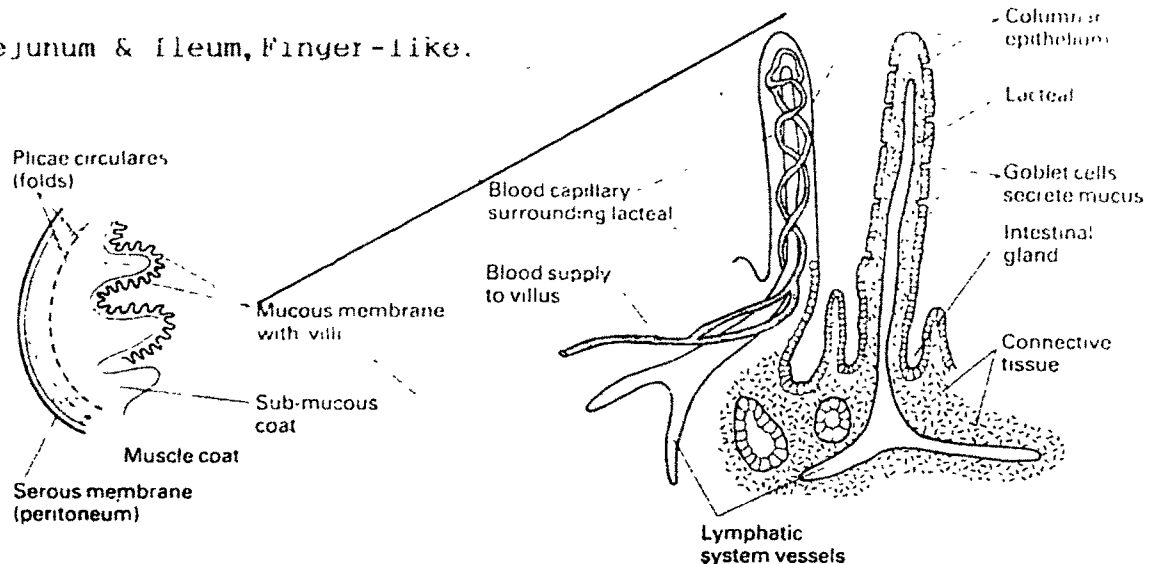


Fig. Cross section of the small intestine

\*Mesentery is a series of membranes, which held the coiled intestine in Abdomen. Blood Vessels & Nerves travel to Intestine through Mesentery.

The Intestinal Gland secretes digestive enzymes: i) Amylases, ii) Proteases & iii) Lipases. The sticky mucous secretion of Brunner's Gland protects the lining of Intestine. Like veins, there are vessels of 'Lymphatic System', that carry cells & proteins which help to defend us from foreign organism, like Bacteria, which comes to Intestine with food.

- i) ABSORPTION: from 'Lumen' to Blood stream &
- ii) SECRETION: from Blood stream to 'Lumen'.

### 1) Emulsification & Hydrolysis of Fats:

## 2) Formation of Micelles:

### 3) Absorption of Digested Fat:

[illegible]

**Unsaturated fatty acid: some double bonds between the carbons** Linolenic acid

Small Intestine ... contd...

4) Resynthesis & Delivery of Lipids to Lacteals:

The absorbed products of digested Fats are incorporated into Triglycerides. **Anabolism** takes place within the epithelial Cells' 'Endoplasmic Reticulum'. The two path-ways are involved:

Major: Monoglyceride Path-way

Minor: -Glycerophosphate Path-way.

B) Digestion & Absorption of Protein: Protein is digested & absorbed in the form of Amino Acid i.e. protein is completely hydrolysed in Lumen.

**Large Intestine:** Small Intestine leads into Large Intestine. Large Intestine is 1.5m long & 6.5cm in diameter. There are 4 regions in Large Intestine: i) Caecum, ii) Colon, iii) Rectum & iv) Anal Canal.

CAECUM: Caecum is a blind sac of about 6cm in which Small Intestine opens through 'ileocaecal valve'. A worm-like structure 'Appendix' is attached to the Caecum.

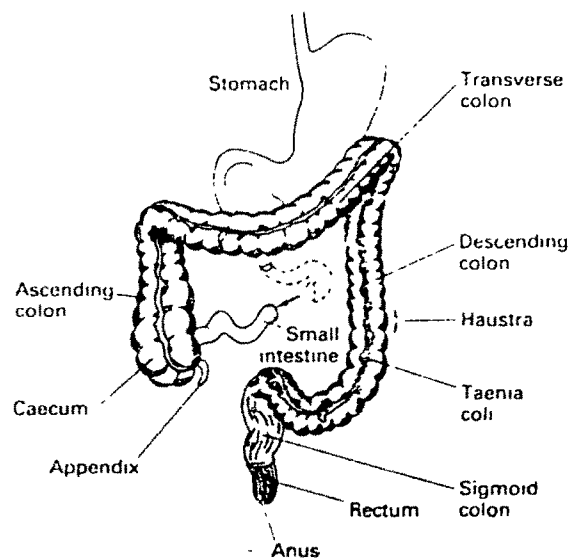


Fig Structure of the large intestine

Large Intestine ... contd...

COLON: Colon runs up i.e. ascending side of the abdomen, goes cross the body i.e. transverse, just beneath the liver, and turn downward i.e. descending near the stomach. As colon descends towards the Rectum, it makes 'S' shaped curve called 'sigmoid'. Colon has pouch like bulges called 'Haustra' all along its length and band of muscles running over the surface i.e. 'Taenia coli'.

RECTUM & ANAL CANAL: Rectum & Anal Canal lead to the exterior of the body. The Anal Canal bears folded mucous membrane with good blood supply. When the veins of Anal Canal get inflamed; the condition is known as 'Piles' or 'Haemorrhoids'. The exit of Anal Canal is guarded by a muscular 'Anal Sphincter'.

#### CONCLUSION:

The food is required to produce heat & energy\* within body, and by doing work, energy restored within body is consumed\*\*. That is why requirement of food is continued throughout life.

The 2nd sub chapter under chapter III, contains the scientific details of digestive process of human food.

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\* (12 - هود - 52)

\*\* (14 - النحل - 6,7)

## sub chapter ii

Digestive Process:

The food that we eat is made up of molecules, which are too large to pass through cell membrane. Digestion makes the food molecules smaller and water soluble, so that they can be used by the cells. Chemical digestion is done by digestive juice contains 'enzymes'.

**Enzymes:** Enzyme is a protein, acts as a chemical 'catalyst'. Many of vitamins are co-enzymes. Co-enzymes enable the enzymes to work properly. Enzymes are named according to the chemical reactions they catalyse:

Amylase aids the break-down of Carbohydrates.

Protease aids the break-down of Proteins.

Lipase aids the break-down of Fats.

HYDROLYSIS: When a chemical is broken down during a chemical reaction during the digestion:

$ABC \longrightarrow A + B + C$  (in presence of enzymes & water)

CCK: When food & acid contents from stomach touches the wall of Small Intestine, a hormone called CCK/Chole-systo-kinin, is secreted. CCK causes the 'Gall Bladder' to contract and eject the 'bile' into the Duodenum, since Bile is must for fat digestion.

DIGESTION IN MOUTH: Saliva is digestive juice in mouth. Amylase/Ptyalin enzyme is found in saliva. Salivary Amylase breaks down large 'Carbohydrate' molecules i.e. Polysaccharides/starch into shorter chains called 'Dextrins' & di-saccharides such as Maltose.

Carbohydrates may not completely break-down in mouth, as we swallow down the food.

Condensation is reverse of Hydrolysis.

$A-B-C \longleftarrow ABC$  (in presence of enzyme & absence of water)

Digestive Process ... contd...

DIGESTION IN STOMACH: Chyme\* is directly passed to stomach from mouth & no digestion takes place within Oesophagus. Chewed & swallowed food is soaked into Gastric Juice. Gastric Juice contains: Mucous, HCl & Gastric Enzymes. Gastric Juice is acidic i.e. pH-1.5 to 2.5, and its main function is to break-down the Proteins.

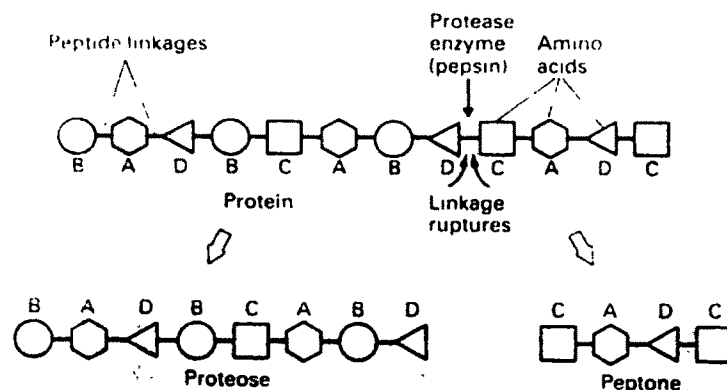
Protease enzyme is secreted in the form of in-active Pepsinogen, and converts to active Pepsin, when Protein & HCl are present in the stomach. Proteins are long chain of Amino Acids & Protease/ Pepsin enzyme breaks the Peptide Linkage. Thus Protein is broken-down into smaller molecules of Proteoses; longer chain & Peptones; smaller chain.

Gastric Juice also contains; Rennin & Lipase enzymes:

RENNIN: Rennin coagulates milk proteins and convert them to insoluble 'casein' from soluble 'caseinogen'. Rennin is important in infants. Rennin works best at pH-5.6. Rennin is not very effective in acidic condition of adult stomach. HCl curdles the milk in adult stomach.

LIPASE: Lipase breaks down milk fat. Lipase also works best at the pH-5.6.

Glucose & Alcohol are partially absorbed in stomach.



**Protein breakdown in the stomach**

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\*chewed & swallowed food soaked into gastric juice, is chyme.

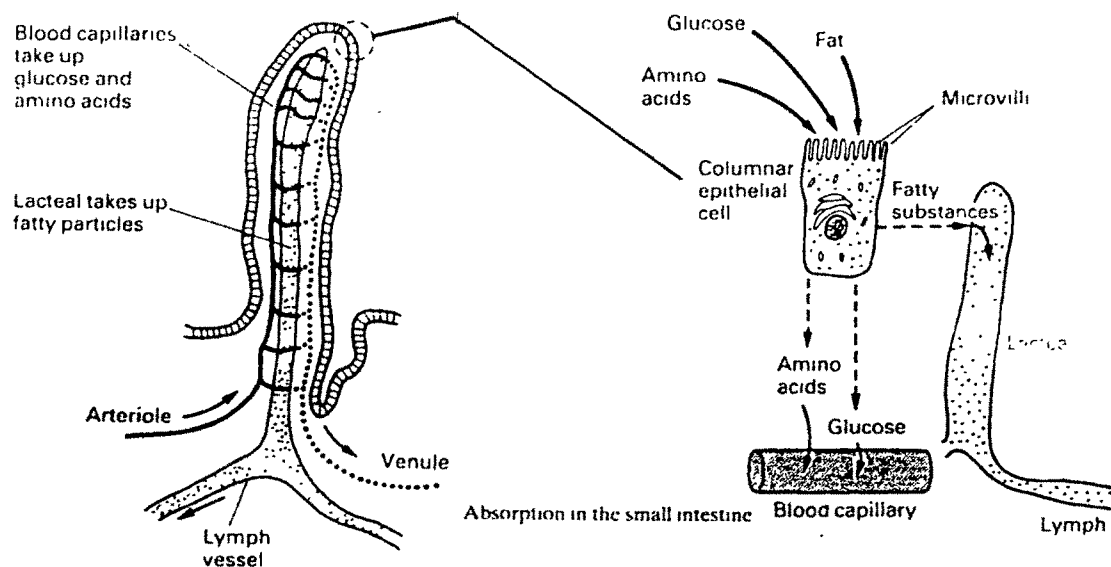
## Digestive Process ... contd...

DIGESTION IN SMALL INTESTINE: Most of the digestion & absorption take place in the small intestine, where two digestive juices are available: i) Pancreatic Juice & ii) Intestinal Juice.

PANCREATIC JUICE: Pancreatic Juice is an alkaline solution pH-7.2 to 8.2, poured out from Pancreas in large quantity i.e. 1.2 to 1.5 lit. per day. Its alkaline pH stops the action of stomach enzymes. When food enters the duodenum, the small intestine provides the necessary environments for its own enzymic activity. Pancreatic Juice contains the following enzymes:

- a) Pancreatic Amylase: Pancreatic Amylase breaks down 'dextrins'; a digested starch in mouth, into 'di-saccharides' i.e. i) Maltose ii) Sucrose & iii) Lactose.
- b) Pancreatic Protease: Protease or Trypsin breaks the Proteins into Proteose & Peptone in the stomach. Again, Pancreatic Protease/ Trypsin enzymes break the Proteoses & Peptones into De-Peptides, and finally into 'Amino Acids'.

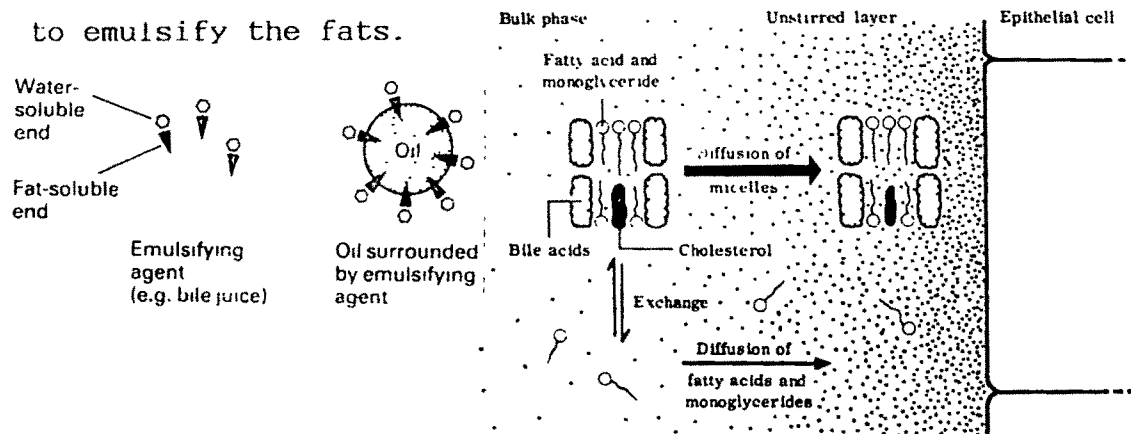
Trypsinogen is activated by 'Enterokinase' enzyme to form active Trypsin, while Chymotrypsinogen is activated by Trypsin to form active Chymotrypsin; another enzyme help to digest porteins.





## Digestive Process ... contd... digestion in small intestine

- c) Pancreatic Lipase: Pancreatic Lipase acts on Fats and breaks them into Fatty Acid & Glycerol, when the Fats are in fine drop-lets i.e. 'emulsion'. Bile Juice is added in small intestine to emulsify the fats.



**Fig.** The role of micelles in fat absorption. 1. They incorporate and maintain the products of fat digestion in a dissolved form in the luminal aqueous contents. 2. They cause more rapid movement of fatty acids and monoglycerides through the unstirred layer. (After Davenport, H. W. (1977). *Physiology of the Digestive Tract*, 4th edn. Year Book Medical Publishers, Chicago.)

INTESTINAL JUICE: Intestinal Juice is slightly alkaline; pH-7.6, secreted in large amount i.e. 2.3 lit. per day. Intestinal Juice digests the undigested part foods from Mouth, Stomach & Duodenum. Intestinal Juice contains the following enzymes:

- Intestinal Amylase: converts di-saccharides to mono-saccharides
- Intestinal Maltase: converts Maltose, a di-saccharide into two molecules of Glucose/mono-saccharide.
- Intestinal Sucrases: breaks down Sucrose/di-saccharide into Glucose & Fructose.
- Intestinal Lactase: breaks down Lactose into Glucose & Galactose.
- Intestinal Protease: Protease or Erepsin converts Di-peptides into individual Amino Acids. This enzyme is also termed as 'Peptidase'

Therefore, the end products of digestive process are; i) Glucose from Carbohydrates, ii) Amino Acids from Proteins & iii) Fatty Acids & Glycerol from Fats.

Digestive Process ... contd...

#### ABSORPTION IN SMALL INTESTINE:

Most of the digested foods are absorbed into Small Intestine across the cell membrane. About 10% absorption takes place in stomach & large intestine.

-Glucose & other mono-saccharides and Amino Acids are taken across the cell membrane of villi by way of 'Osmosis', 'Diffusion' & 'Active Transport Method'. Glucose & Amino Acids go to blood capillaries of Villi and then transported to liver by Hepatic Portal System.

-Fatty Acids & Glycerol do not straightly go to the blood stream, but pass into lacteal. Lacteals are vessels containing Lymphs within Villus.

Glycerol passes fairly easily, because it dissolves in water, but Fatty Acid does not dissolve in water. Therefore, 'Bile Salts' combine with Fatty Acid to make it soluble in water. Bile Salt-Fatty Acid complex splits apart. Once arrived inside the Lacteal, Fatty Acid & Glycerol recombines to form 'Fat' again. That is why fat appears in 'lymphatic System' and not in Blood stream.

The Lymph empties into the blood stream at the 'sub-clavian vein' in the neck and thus fat eventually reaches to Liver by way of general blood circulation & Hepatic Artery.

#### ACTIVITIES IN THE LARGE INTESTINE:

There is no enzyme secretion in the large intestine, therefore, no digestion. But the undigested food reaches there may be subject some 'Bacterial Fermentation'. Vitamins may be absorbed from 'Bacteria' living in the large intestine.



### sub chapter iii

#### Blood & Circulation:

Different tissues of our body are linked by way of 'Blood Vessels'. Blood of these Vessels transports Oxygen & Food Nutrients to the **cells** and helps to transport out the waste product, like CO<sub>2</sub>. The blood is pumped & circulates within the body through these vessels, by means of a muscular 'Heart'.

#### The Blood:

The blood is a 'fluid connective tissue', made up of i) Plasma & ii) Corpuscles i.e. Cellular Formed Elements. The blood volume in human body is 79ml per kg of the body weight. Fatty tissues, however has less blood volume, due to increase of fats. 7% of total body weight is blood i.e. 4-5 lit. in females and 5-6 lit. in males. Blood circulates the body about 1000 times per day.

#### Blood Composition:

##### PLASMA:

Plasma is a pale straw coloured fluid, constitutes 60% of total blood volume. Plasma contains 90% water and salts, like Na, K, Ca, Mg, Cl & Proteins.

Main function of plasma is 'transportation', therefore, it also contains Glucose, Lipids, Amino Acids, Vitamins, Hormones & Urea. There are 70 proteins in Plasma, but the most common are: Albumin, Globulin & Fibrinogen.

Plasma also help in the formation of 'Fibrinogen' & maintenance of proper 'osmotic pressure' difference between blood vessels & tissue fluids - that allows the movements of materials from blood

Blood Circulation ... plasma ... contd...

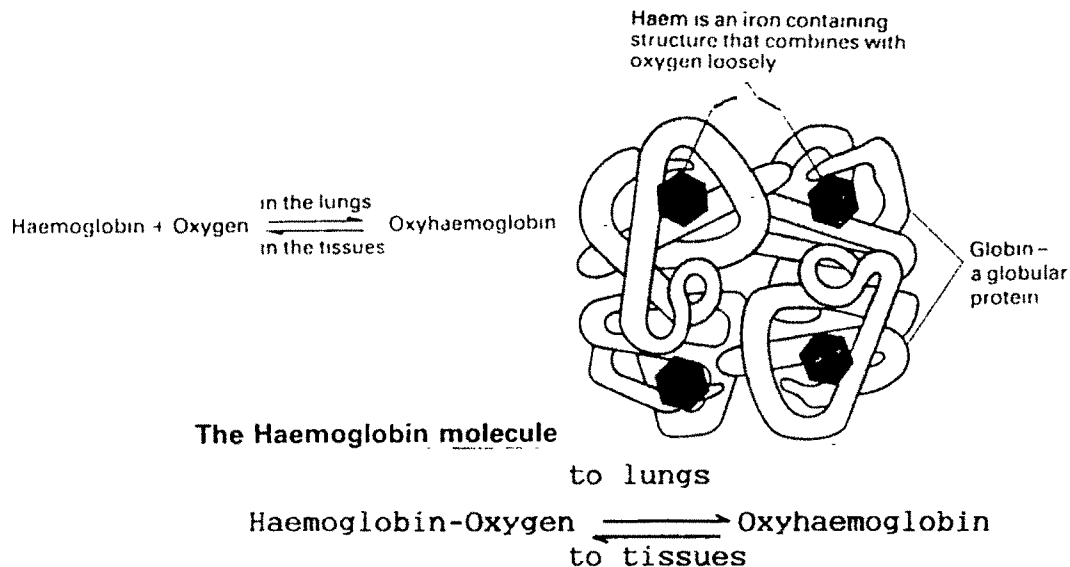
into tissues. Proper 'Blood Pressure' is also maintained by the 'viscosity' of blood, caused by proteins. Proteins buffers the blood to keep the pH at 7.4.

### BLOOD CORPUSCLES:

There are mainly 3 types of blood corpuscles: i) Erythrocytes or Red Blood Corpuscles/RBC, ii) Leucocytes or White Blood Corpuscles/WBC & iii) Thrombocytes or Blood Platelets.

#### i) Erythrocytes:

Erythrocytes or RBC are in majority in Plasma. RBC contains Iron bearing pigments 'Haemoglobin' that transport Oxygen around the body. Haemoglobin is made up of 4 'Haem' groups, and each group has an Iron atom in centre, rest of the molecule is a protein, called 'Globin'. Oxygen is loosely attaches to the Iron atom during transport, while 'CO<sub>2</sub>' is attaches to 'Globin'.



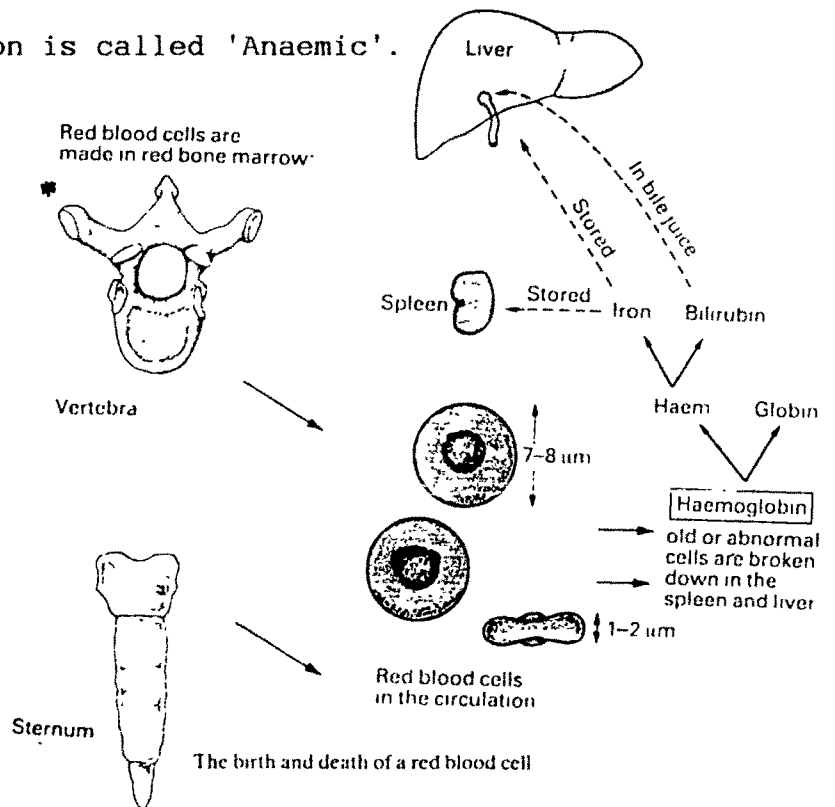
RBC is made in 'Bone-marrow' from nucleated cells called 'Erythroblasts'. But the nucleus is lost as the cells mature & enter the circulation, the loss of nucleus gives maximum space for Haemoglobin. RBC live for 4 months, after that they are destroyed

## Blood Circulation ... RBC ... contd...

in the Liver to form a bile pigment 'Bile Rubin', and Iron is removed and stores as 'Ferritin'. The left-over of destroyed RBC in Liver are recycled for re-use.

In Embryo, the 'spleen' produces RBC, while in adults, spleen stores blood & ejects out extra blood to the circulation, when required during 'emergency'.

A healthy male must contain 14-18g/100ml of Haemoglobin, while a healthy female must have 12-16g/100ml of Haemoglobin. Below this level person is called 'Anaemic'.

ii) Leucocytes:

Leucocytes or WBC have nucleus, but the shapes vary. WBC are larger in size, but less in number than of RBC. WBC are of two types: a) Granulocytes & b) Agranulocytes.

\* وَإِذْ أَخَذْنَا مِنْ بُنَىٰ آدَمَ مِنْ قُلُوبِهِمْ ذُرِّيَّتَهُمْ - (9 - الأعراف - 72)

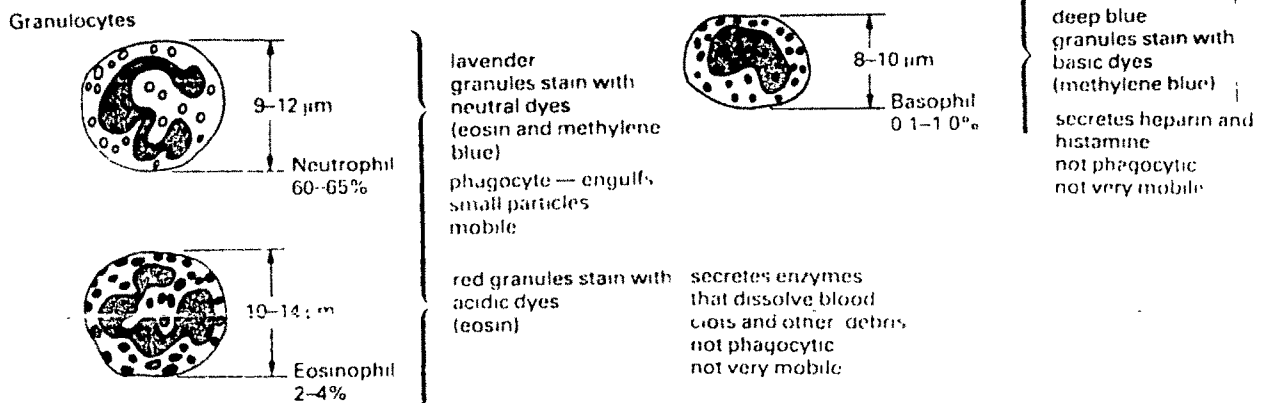
## Blood Circulation ... WBC ... contd...

a) Granulocytes: Granulocytes are formed in 'Red Bone Marrow'. WBC are of 3 types: 1) Neutrophils, 2) Eosinophils & 3) Basophils.

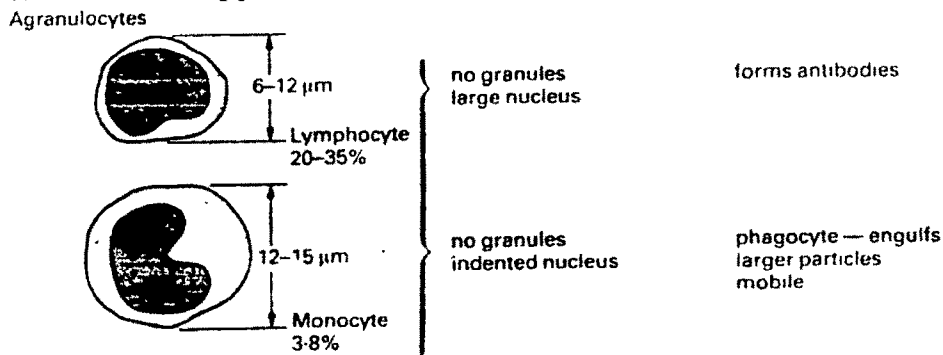
1) Neutrophils: Lavender granules of Neutrophils are stained with neutral dyes i.e. acidic 'Eosin' & basic Methylene (blue). Neutrophils are 'phagocytes' & 'mobile'.

2) Eosinophils: Red granules, stained with acidic dyes 'Eosin'. Eosinophils secrete enzymes that dissolve blood clots. They are less-mobile & non-phagocytes.

3) Basophils: Deep blue granules, stained with basic dyes; 'Methylene blue'. Basophils secrete Heparin & Histamine. Non-phagocytes & non-mobiles.



b) Agranulocytes: Agranulocytes are formed in 'Lymphoid' tissues, within Red Bone Marrow, as well as in Lymph Nodes, Tonsils, Thymus & Spleen. Agranulocytes are found in large numbers in the 'Lymphatic System', where they aid against 'infections'. Agranulocytes are of two types: i) Lymphocytes & ii) Monocytes.



Blood Circulation ... WBC ... contd...

- i) Lymphocytes: No granules, large nucleus. Lymphocytes form 'antibodies'.\*
- ii) Monocytes: No granules, indented nucleus, phagocytes\*\* & are mobile.
- iii) Thrombocytes:

Thrombocytes are also called as Blood Platelets. Thrombocytes are not complete cells, but fragments of certain Red Bone Marrow Cells. Blood Platelets form an 'enzyme' to clot the blood. Vitamin 'K' is formed in 'Colon', by Bacteria. Excess of antibiotic bacteria kill the Vitamin K forming bacteria. This may endanger 'Haemorrhage'.

### Cardio Vascular System

The system through which blood circulates in the body is called Cardio Vascular System or Blood Circulatory System, which contains. i. Blood Vessels and ii. Heart.

#### **Blood Vessels:**

The Blood Vessels are of two types: a) Artery & b) Vein

ARTERY: The blood is pumped away from heart through arteries, which lead into smaller vessels called 'Arterioles'. Arterioles ultimately pass through tissues in 'capillaries'.

VEIN: Blood is carried back to heart firstly through smaller vessels

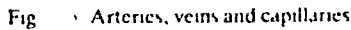
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\*Harmful Bacteria introduced into blood circulation counteract growth are 'antibodies'.

\*\*Capacity to engulf the 'antibodies'



called 'veinules', which lead to 'Veins'. Some veins contain 'valve' to prevent back flow of the blood. Veins generally contain de-oxygenated blood, while 'pulmonary' vein contains oxygenated blood.



Varicose Veins: When blood pushes against the wall of veins, causes 'bulging' of the veins. This damage is called Varicose.

وَكُتِبَ عَلَيْكُمُ الْقِتْلَةُ حَقًّا ۚ فَأَقِمْ وَجْهَكَ لِلدِّينِ حَنِيفًا ۚ فَمَنَّ اللَّهُ عَلَيْنَا وَوَقَدَّ لَنَا ذَلِيلًا ۚ  
لَهُ لَقَطٌ مِّنَ النَّوْتَيْنِ ۖ هَٰذَا فَخْرُكُمْ ۖ إِنَّ أَكْثَرَ النَّاسِ لَا يَعْلَمُونَ (26 - ق: 16)

Blood Circulation ... contd...

### Heart:

Heart is a two sided muscular pump with 4 chambers lined by epithelium called 'Endocardium'. Right side chamber receives de-oxygenated blood and left side receives Oxygenated blood. The whole muscular pump is of about .4 kg and size of a 'fist'. Heart is enclosed by loose serous membrane from out side called 'pericardium'. There is shock-absorbing fluid called 'Pericardial Fluid'.

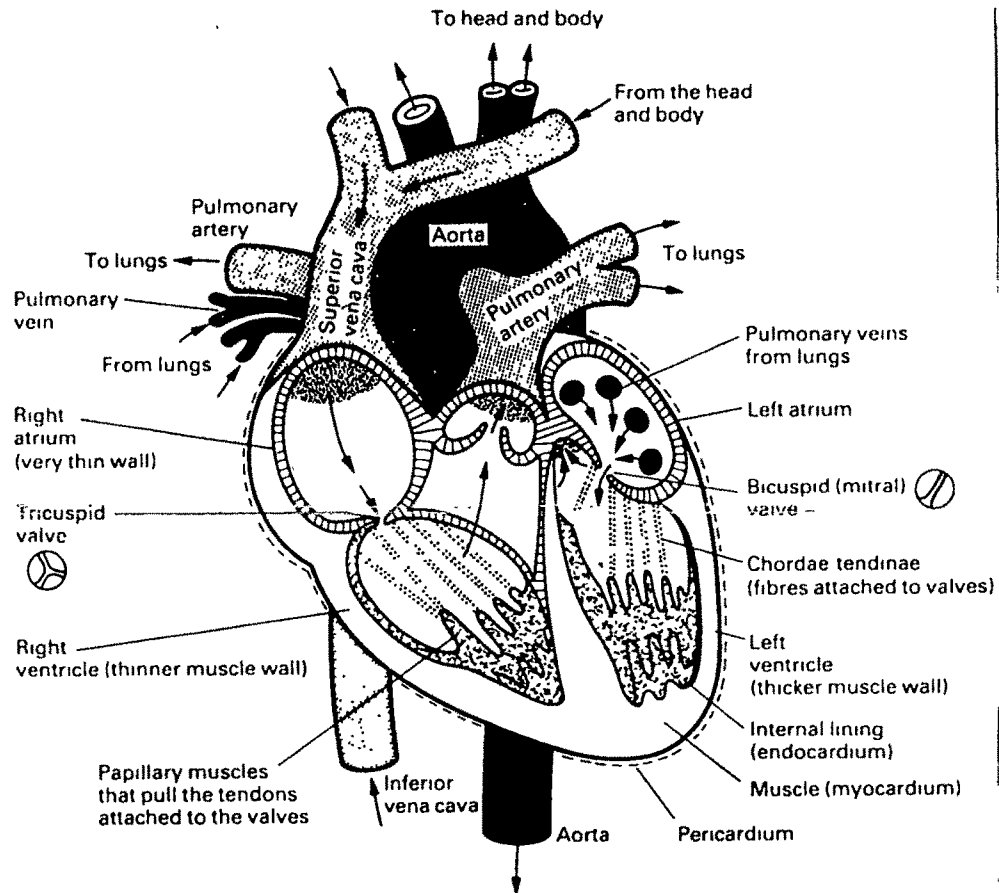


Fig . Interior view of the heart

Heart starts beating from 'Foetal' life i.e. from two months. There are 'Coronary Blood Vessels', which carry oxygen to the heart or

مَا جَعَلَ اللَّهُ لِرَجُلٍ مِّنْ قَلْبَيْنِ فِيْ جَوْفِهِ ۖ ... ۝ (٢١ - الاحزاب - ٤)

Blood Circulation ... contd...

## Heart . . .

Cardiac muscles. If oxygen supply to the Cardiac muscles is denied, the muscles cease to beat and a man loses 'consciousness'. Because, Brain cannot function without oxygen. If oxygen supply to the Brain by way of blood circulation stops for 5 seconds, the human remains unconscious, if oxygen starvation continues for 4-5 minute, irreversible brain damage takes place.

The 4 chambers of heart are; two sac like 'Atrium' on the top and two larger & more muscular 'Ventricle', situated below the Atrium. The thick muscle that makes-up ventricle walls is called Myocardium.

### FUNCTIONS OF THE HEART:

There are two events that move blood through heart: i) Systole i.e. contraction & ii) Diastole i.e. Relaxation. Repeated Systole & Diastole of heart muscles is known as 'Cardiac Cycle'.

When 'Atrium' contracts, 'Ventricle' relaxes the same time; blood squeezes into the Ventricle. This short phase is followed by contraction of Ventricles and relaxation of atria. As the Atria relax they draw in the blood from Veins. As the Ventricles contract, they pump blood into the Arteries and around the body.

### Circulation of Blood:

There are two Circulatory systems in the body:

- 1) Pulmonary System: This system sends blood through the lungs to pick oxygen. Blood returning from tissues is de-oxygenated, so, it has to pass through lungs to pick oxygen. Therefore, de-oxy-

Blood Circulation ... contd...

generated blood first comes to Right Atrium, through two veins; Superior Vena Cava & Inferior Vena Cava. Then the blood is pumped Right Ventricle and then ultimately, goes to lungs through 'Pulmonary Artery'. The blood receives oxygen from lungs during 'inhale' and the oxygenated blood returns to the Left Atrium through Pulmonary Vein. Thus, pure blood arrives in the heart.

2) Systematic System: This system sends oxygenated blood to the all parts of the body. This system is sub-divided into: i) Coronary Circulation & ii) Hepatic Portal Circulation.

i) Coronary Circulation: Aorta carries the oxygenated blood from Left Ventricle to be delivered to all major organs of the body. The heart itself is supplied with blood through 'Coronary-Arteries', which can be seen running over out-side the heart-muscles. If these Arteries get blocked, muscles get starved of oxygen and Heart Attack may take place.

ii) Hepatic Portal Circulation: Blood leaving Intestine carries food 'nutrients', which are needed to be stored, mainly in Liver. The Blood Vessels that run from Intestine to the Liver constitute 'Hepatic Portal System'. The major blood vessels starts in Villi in the forms of 'capillaries' and end in the Liver as 'capillaries'.

Thus, blood obtained after the food is digested, goes throughout the body via blood vessels, vitalizing all the body systems and so the Reproductive System. Therefore, now, I take the details of Reproduction in the next chapter.