

## Peran nutrisi pada pencegahan & pengelolaan anemia

Minidian Fasitasari  
Bagian Ilmu Gizi FK Unissula

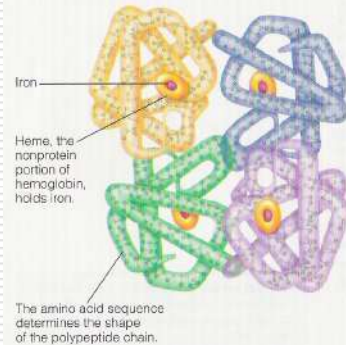
- Definisi anemia?
- Klasifikasi anemia?
- Peran nutrisi?
  - Fe
  - Vitamin E
  - Folat
  - B12

## Anemia defisiensi besi

- Functional iron: 85% Hb, 15% myoglobin, enzim
- Suplai Fe turun → sintesis SDM turun, mikrositik & hipokromik

FIGURE 4-5 The Structure of Hemoglobin

Four highly folded polypeptide chains form the globular hemoglobin protein.



## Contributing factors

### 1. Inadequate intake

- Male 8 mg/d, female 18 mg/d, vegetarians 1.8 times
- Consumption of rich-iron foods
  - Meat, poultry, fish, eggs & grain (whole, enriched, fortified)
- Absorption
  - Type: non heme (less well absorbed)
  - Enhance: MFP factor (a peptide), vitamin C
  - Inhibit: phytates (legumes, grains, cereal); vegetable proteins (soybeans, legumes, nuts); calcium (milk); tannic acid (and other polyphenols in the tea & coffee)

## Contributing factors

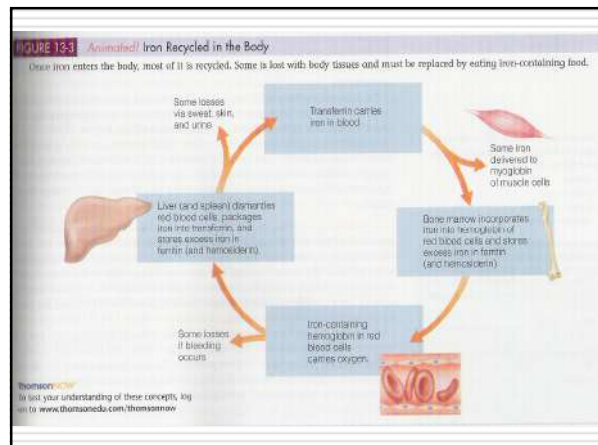
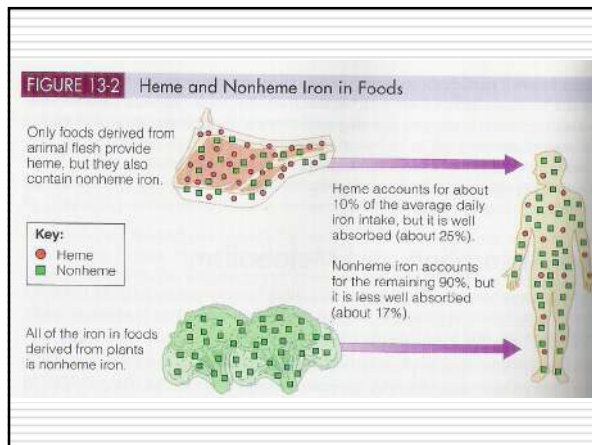
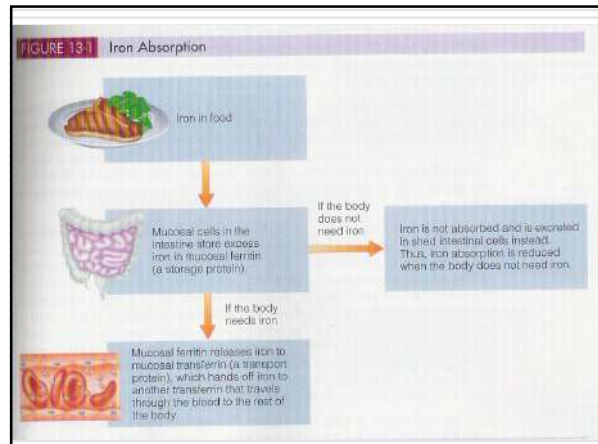
### 2. Increased Physiologic Requirements

- Pregnancy
- Lactation
- Infants & young children
- Teenagers

## Contributing factors

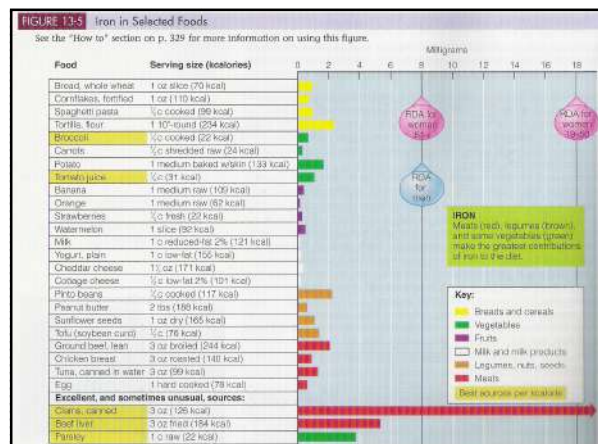
### 3. Blood Loss

- ❑ Iron content of blood:  $\pm 0.5$  mg/100mL blood
- ❑ Trauma, disease, blood donation
- ❑ Women: mens, partus



## Bahan makanan

Makanan sumber zat besi	
Baik sekali: >4 mg	Baik: 2-4 mg
<ul style="list-style-type: none"> <li>Bayam merah</li> <li>Beras merah</li> <li>Hati sapi</li> <li>Havermout</li> <li>Jagung kuning</li> <li>Kacang hijau</li> <li>Kacang merah</li> <li>Kedelai</li> <li>Kerang</li> <li>Molasses</li> <li>Oncom</li> <li>Sereal dengan fortifikasi zat besi</li> <li>Telur bebek</li> <li>Tempe</li> </ul>	<ul style="list-style-type: none"> <li>Bayam</li> <li>Daging merah</li> <li>Kacang polong</li> <li>Kapri</li> <li>Prune juice</li> <li>Raisin</li> <li>Telur ayam</li> <li>Tiram</li> </ul>

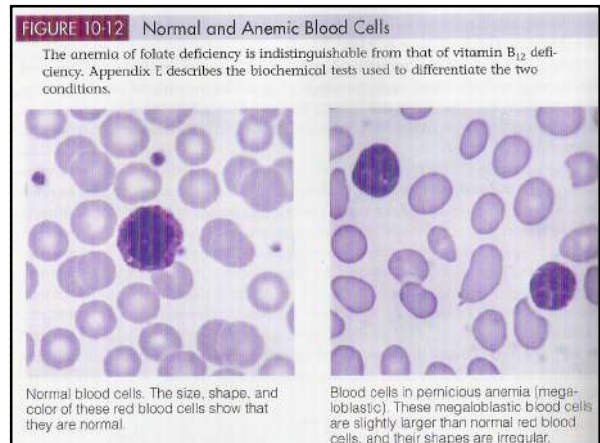
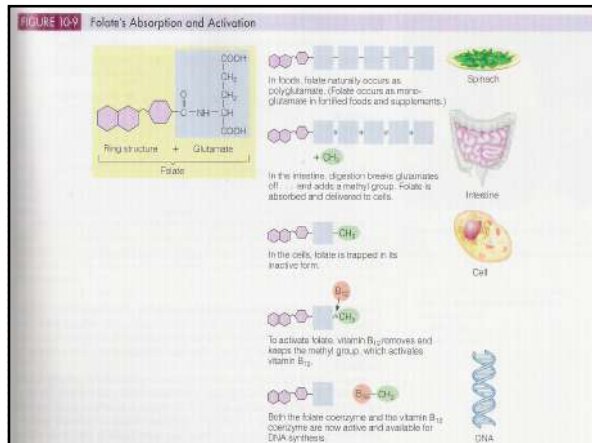


## Premature infant

- ❑ Hemolytic anemia in premature infant
- ❑ Response (+) to Vitamin E
- ❑ Help prevent destruction of RBC
- ❑ Formula for premature infants → proportion vitamin E, PUFA, iron

## Anemia defisiensi folat & B12

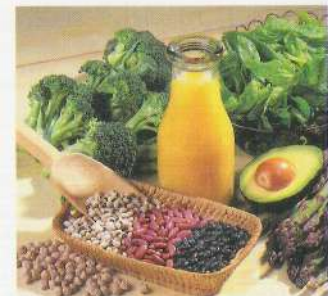
- ❑ Nutritional megaloblastic anemia
- ❑ RDA: folat 400 mcg/d; B12 3 mcg/d
- ❑ Folat, high risk: low-income pregnant women, alcohol abuser
- ❑ B12: rare, elderly, intrinsic factor ↓ → pernicious anemia
- ❑ Manifestation indistinguishable → DNA synthesis



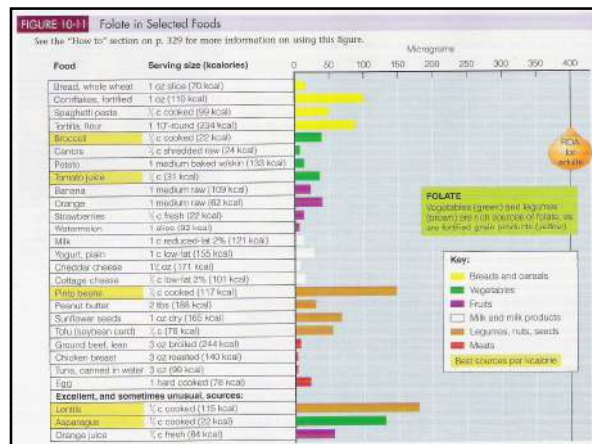
## Bahan makanan...

### Makanan sumber Folat

Baik sekali: >100 µg	Baik: 15-99 µg
▪Asparagus	▪Almond
▪Bayam	▪Beras merah/tumbuk
▪Buncis	▪Bit
▪Hati dan jeroan	▪Kembang kol
▪Kapri	▪Roti gandum-utuh
▪Kacang tanah	▪Telur
▪Orange juice	▪Selada
	▪Sereal instant



Leafy dark green vegetables (such as spinach and broccoli), legumes (such as black beans, kidney beans, and black-eyed peas), liver, and some fruits (notably citrus fruits and juices) are naturally rich in folate.



## Bahan makanan...

### Makanan sumber vitamin B<sub>12</sub>

- Daging merah
- Hati
- Ikan
- Petis
- Ragi
- Susu (milkshake)
- Tempe
- Terasi
- Udang
- Yoghurt

**TABLE E-8 Laboratory Tests Useful in Evaluating Nutrition-Related Anemias**

Test or Test Result	What It Reflects
<b>For Anemia (general)</b>	
Hemoglobin (Hgb)	Total amount of hemoglobin in the red blood cells (RBC)
Hematocrit (Hct)	Percentage of RBC in the total blood volume
Red blood cell (RBC) count	Number of RBC
Mean corpuscular volume (MCV)	RBC size; helps to determine if anemia is microcytic (iron deficiency) or macrocytic (folate or vitamin B <sub>12</sub> deficiency)
Mean corpuscular hemoglobin concentration (MCHC)	Hemoglobin concentration within the average RBC; helps to determine if anemia is hypochromic (iron deficiency) or normochromic (folate or vitamin B <sub>12</sub> deficiency)
Bone marrow aspiration	The manufacture of blood cells in different developmental states
<b>For Iron-Deficiency Anemia</b>	
↓ Serum ferritin	Early deficiency state with depleted iron stores
↓ Transferrin saturation	Progressing deficiency state with diminished transport
↑ Erythrocyte protoporphyrin	Later deficiency state with limited hemoglobin production
<b>For Folate-Deficiency Anemia</b>	
↓ Serum folate	Progressing deficiency state
↓ RBC folate	Later deficiency state
<b>For Vitamin B<sub>12</sub>-Deficiency Anemia</b>	
↓ Serum vitamin B <sub>12</sub>	Progressing deficiency state
Schilling test	Absorption of vitamin B <sub>12</sub>

## Diet yang disarankan

- Diet kaya Fe, folat, & vitamin B12
- Diet sumber protein hewani & nabati yg seimbang. Protein → globin, enzim, perbaikan jaringan, pertumbuhan
- Diet sayuran hijau 3x/hr
- Minum sari buah yg kaya vitamin C (jambu, jeruk, tomat) 1 gelas/hr

## Diet TKTP

- Tujuan:
  - Memberikan makanan secukupnya untuk memenuhi kebutuhan kalori dan protein yang bertambah guna mencegah dan mengurangi kerusakan jaringan tubuh atau guna menambah berat badan hingga mencapai normal.

## Diet TKTP...

- Syarat:
  - Tinggi kalori
  - Tinggi protein
  - Cukup mineral dan vitamin
  - Mudah dicerna

## Diet TKTP...

- Indikasi:
  - gizi kurang: defisiensi kalori, protein, dan **anemia**
  - hyperthyroid
  - pre- & post- operasi tertentu, bila dapat menerima makanan lengkap
  - baru sembuh dari penyakit dengan panas tinggi atau penyakit berlangsung lama dan telah dapat menerima makanan lengkap
  - trauma, combustio atau mengalami perdarahan banyak
  - hamil dan post-partum

## Diet TKTP...

- Macam:
  - Tergantung kondisi Px
  - **Diet TKTP I**
    - Kalori : 2600
    - Protein 100 g (2 g/kgBB)
  - **Diet TKTP II**
    - Kalori : 3000
    - Protein : 125 g (2 ½ g/kgBB)

## Diet TKTP...

- **Mempermudah: makanan biasa + lauk & susu**

	TKTP I		TKTP II	
	Berat (g)	URT	Berat (g)	URT
Susu	200	1 gls	400	2 gls
Telur	50	1 btr	100	2 btr
Daging	50	1 ptg sdg	100	2 ptg sdg

## Diet TKTP...

□ Nilai gizi	TKTP I	TKTP II
Kalori	2590	3020
Protein	103 g	125 g
Lemak	73 g	103 g
Karbohidrat	398 g	416 g
Kalsium	0,7 g	1,4 g
Besi	30,2 mg	36 mg
Vitamin A	9062 SI	9787 SI
Thiamin	1,5 mg	1,7 mg
Vitamin C	114 mg	116 mg

## Diet TKTP...

- **Pembagian makanan sehari (sbg tambahan)**

Waktu	TKTP I	TKTP II
Pagi	1 gls susu	1 gls susu
Siang	1 btr telur	1 btr telur 1 ptg daging
Sore	-	1 gls susu
Malam	1 ptg daging	1 btr telur 1 ptg daging

## Diet TKTP...

- **Bahan makanan yg baik diberikan**
  - **Sumber protein hewani:**
    - ayam, daging, hati, ikan, telur, susu, keju.
  - **Sumber protein nabati:**
    - kacang-kacangan dan hasilnya: tahu, tempe, dan oncom.

## Diet TKTP...

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### ❑ Bahan makanan yang dihindarkan

- Makanan yang terlalu manis dan gurih yang dapat mengurangi nafsu makan
  - seperti: gula-gula, dodol, cake, tarcis, dsb.
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## Diet TKTP...

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### ❑ Cara memesan diet:

- Diet Tinggi Kalori Tinggi Protein I (TKTP I), atau
  - Diet Tinggi Kalori Tinggi Protein II (TKTP II)
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## Referensi

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