

Peran nutrisi pada pencegahan & pengelolaan anemia

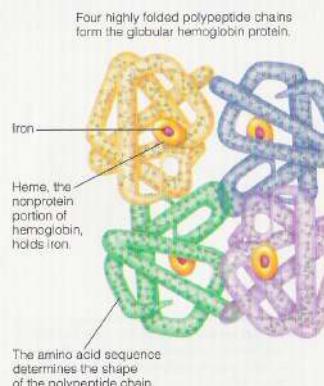
Minidian Fasitasari
Bagian Ilmu Gizi FK Unissula

- 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 6-5 | The Structure of Hemoglobin



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: ± 0.5 mg/100mL blood
- Trauma, disease, blood donation
- Women: mens, partus

FIGURE 13-1 Iron Absorption

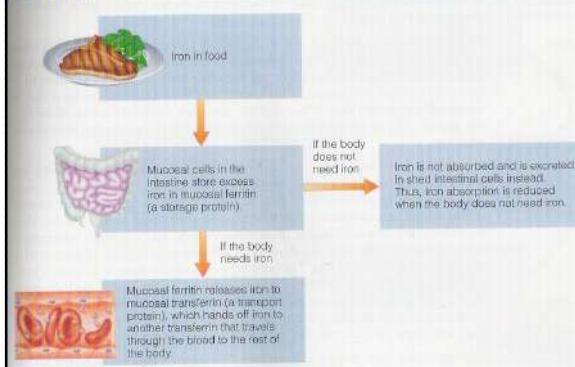


FIGURE 13-2 Heme and Nonheme Iron in Foods

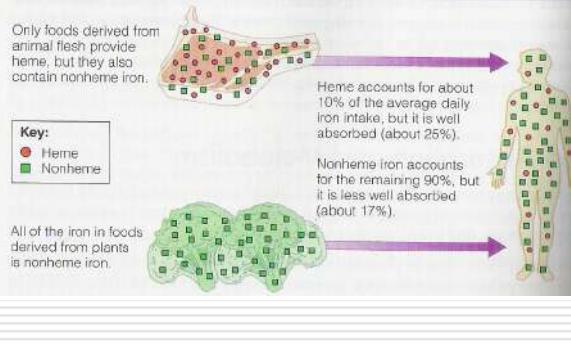
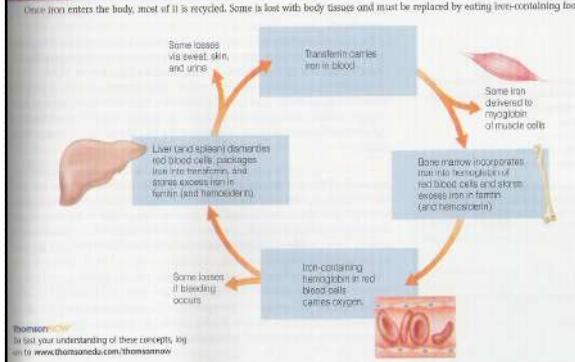


FIGURE 13-3 *Anatomical* Iron Recycled in the Body

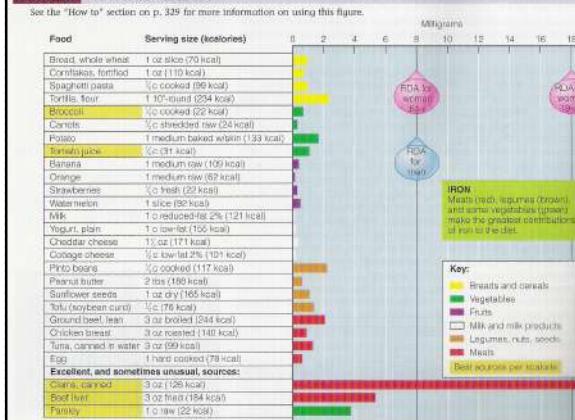


Bahan makanan

Makanan sumber zat besi

Baik sekali: >4 mg	Baik: 2-4 mg
▪ Bayam merah	▪ Bayam
▪ Beras merah	▪ Daging merah
▪ Hati sapi	▪ Kacang polong
▪ Havermout	▪ Kapri
▪ Jagung kuning	▪ Prune juice
▪ Kacang hijau	▪ Raisin
▪ Kacang merah	▪ Telur ayam
▪ Kedelai	▪ Tiram
▪ Kerang	
▪ Molasses	
▪ Oncom	
▪ Sereal dengan fortifikasi zat besi	
▪ Telur bebek	
▪ Tempe	

FIGURE 13-5 Iron in Selected Foods



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

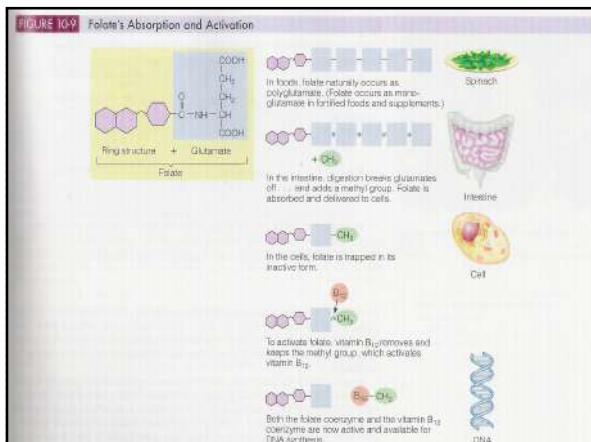
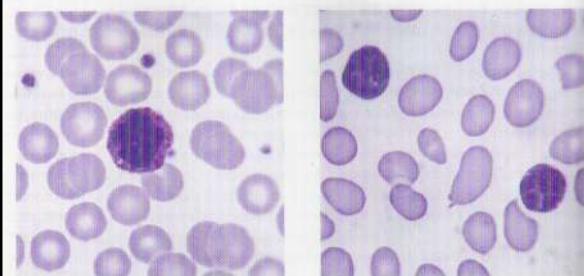


FIGURE 10-12 Normal and Anemic Blood Cells

The anemia of folate deficiency is indistinguishable from that of vitamin B₁₂ deficiency. Appendix E describes the biochemical tests used to differentiate the two conditions.



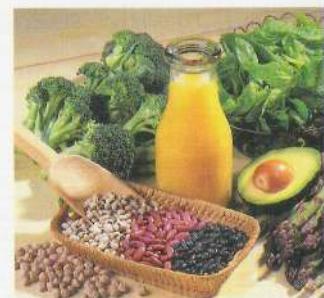
Normal blood cells. The size, shape, and color of these red blood cells show that they are normal.

Blood cells in pernicious anemia (megaloblastic). These megaloblastic blood cells are slightly larger than normal red blood cells, and their shapes are irregular.

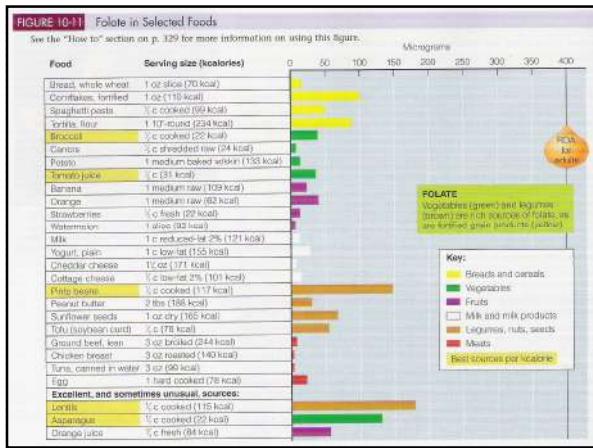
Bahan makanan...

Makanan sumber Fолат

Baik sekali: >100 µg	Baik: 15-99 µg
■ Asparagus	■ Almond
■ Bayam	■ Beras merah/tumbuk
■ Buncis	■ Bit
■ Hati dan jerohan	■ 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 B₁₂

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

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

Test or Test Result	What It Reflects
For Anemia (general)	
Hemoglobin (Hg)	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 ₁₂ 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 ₁₂ deficiency)
Bone marrow aspiration	The manufacture of blood cells in different developmental states
For Iron-Deficiency Anemia	
↓ Serum ferritin	Early deficiency state with depleted iron stores
↓ Transferrin saturation	Progressing deficiency state with diminished transport iron
↑ Erythrocyte protoporphyrin	Later deficiency state with limited hemoglobin production
For Folate-Deficiency Anemia	
↓ Serum folate	Progressing deficiency state
↓ RBC folate	Later deficiency state
For Vitamin B₁₂-Deficiency Anemia	
↓ Serum vitamin B ₁₂	Progressing deficiency state
Schilling test	Absorption of vitamin B ₁₂

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...

- 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...

- Cara memesan diet:**
 - Diet Tinggi Kalori Tinggi Protein I (TKTP I), atau
 - Diet Tinggi Kalori Tinggi Protein II (TKTP II)

Referensi

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