



Preparing of healthy pregnancy in preventing stunting

Makmur Sitepu

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Commonly used anthropometric indicators

- ❖ Stunting (Low height for age compared to the reference population)
- ❖ Intrauterine growth restriction (Refers to a fetus that has failed to achieve its genetically determined growth potential)
- ❖ Low birth weight (below 2.5 kg)



the stunting syndrome", which includes:

- ✓ Developmental delay
- ✓ Impaired immune function (increased morbidity and mortality)
- ✓ Reduced cognitive function
- ✓ Mental and cognitive impairment
- ✓ Metabolic disturbance
- ✓ Shorter adults have a functional limitations
- ✓ Shorter adults have a reduced working capacity

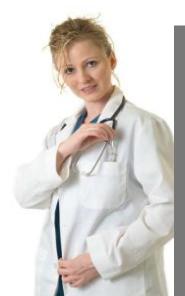
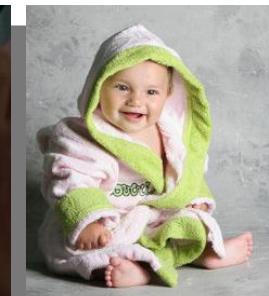
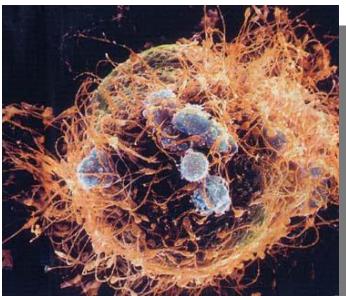
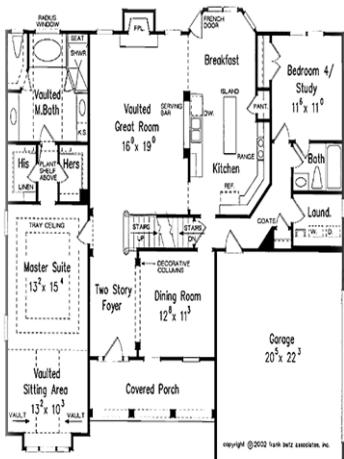


The concept of 1000 days

- ✓ Stunting commonly occurs during fetal life, and soon after birth up to until the second year of life.
- ✓ The development of stunting follows the same pattern in all the regions of the world
- ✓ This critical period is equivalent to first 1000 days
- ✓ This critical period is equivalent to first 1000 days of life = *270 days (9 months of pregnancy) + 365 days (1st year of life) + 365 days (2nd year of life)*.

Hamil =

Membangun janin - Manusia

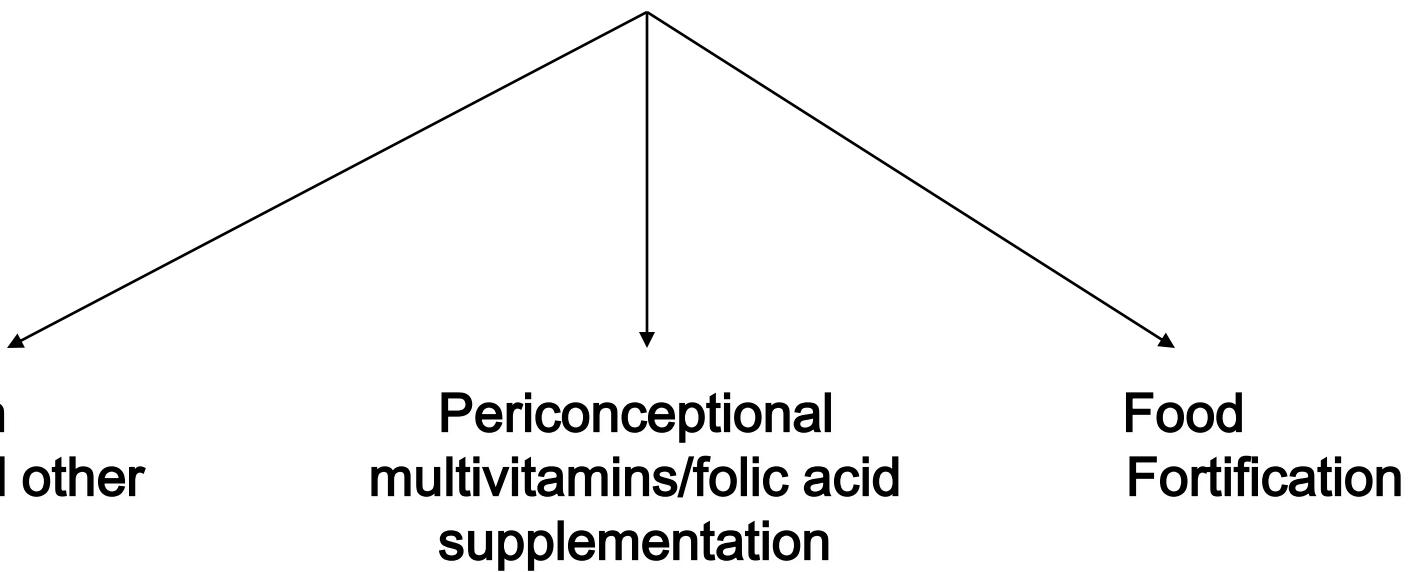




Periconceptional Care

- 1. Check up of reproductive health**
- 2. The 3-month preparation for conception**
- 3. Better protection of early pregnancy**

General Prevention





Pra Nikah/ Pra Konsepsi

- ❖ Regularitas Menstruasi
- ❖ BMI: 20 -23
- ❖ Olah raga: Rutin
- ❖ Pemeliharaan gigi & Sarari
- ❖ Lengkapi vaksinasi: DT, MMR, HBV, Polio
- ❖ General Check Up:
 - Skrening thalasemia
 - Skrening DM
 - Skrening Thyroid
 - Fungsi Hati - Ginjal
 - Profil Lemak

TANTANGAN UTAMA GIZI SELAMA KEHAMILAN



Status gizi seorang wanita sebelum hamil:

menentukan awal perkembangan plasenta dan embryo



Berat badan ibu pada saat pembuahan:

Menjadi kurus atau kegemukan dapat mengakibatkan kehamilan beresiko dan berdampak pada kesehatan anak dikemudian hari

Kebutuhan gizi:

meningkat pada kehamilan, khususnya energi, protein serta beberapa vitamin dan mineral



Jumlah asupan makanan:

ibu tidak perlu 'makan untuk berdua', melainkan harus 'berfikir untuk berdua' - kualitas makanan adalah kuncinya

KEBUTUHAN GIZI SELAMA KEHAMILAN



Wanita harus memiliki suplemen asam folat sebelum kehamilan dan pada trisemester pertama, untuk mencegah cacat tabung saraf seperti spina bifida



Banyak wanita usia reproduktif memiliki status vitamin D yang buruk, sehingga suplemen vitamin D dianjurkan di banyak negara

Kebutuhan zat besi, yodium dan asam lemak omega 3 (DHA) meningkat.



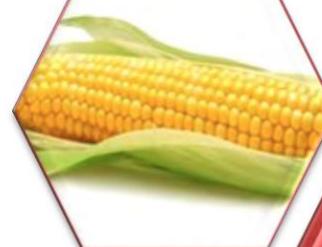
Para ahli telah menyarankan asupan asam lemak omega 3 (DHA) untuk ibu hamil agar terpenuhi setiap hari

TRIMESTER 1

Ngidam,
Morning
Sickness



0 – 12 mg
Pertumbuhan
cepat organ
dan sistem
saraf pusat



Perbaiki
jenis
makanan
yang
masuk

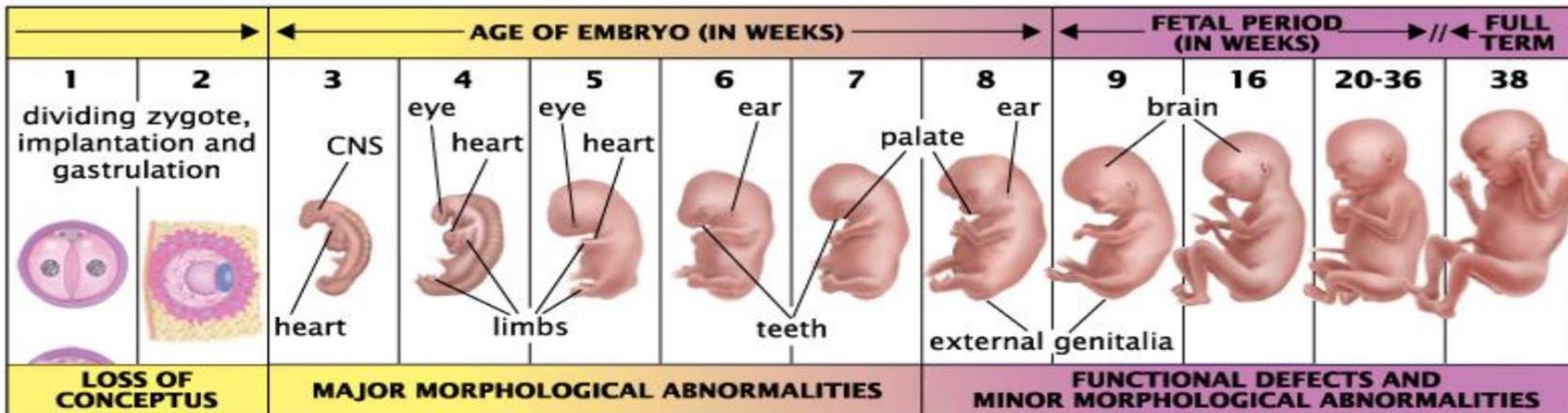
Belum
perlu
penambah
an kalori



Atur
kembali
jadwal
makan

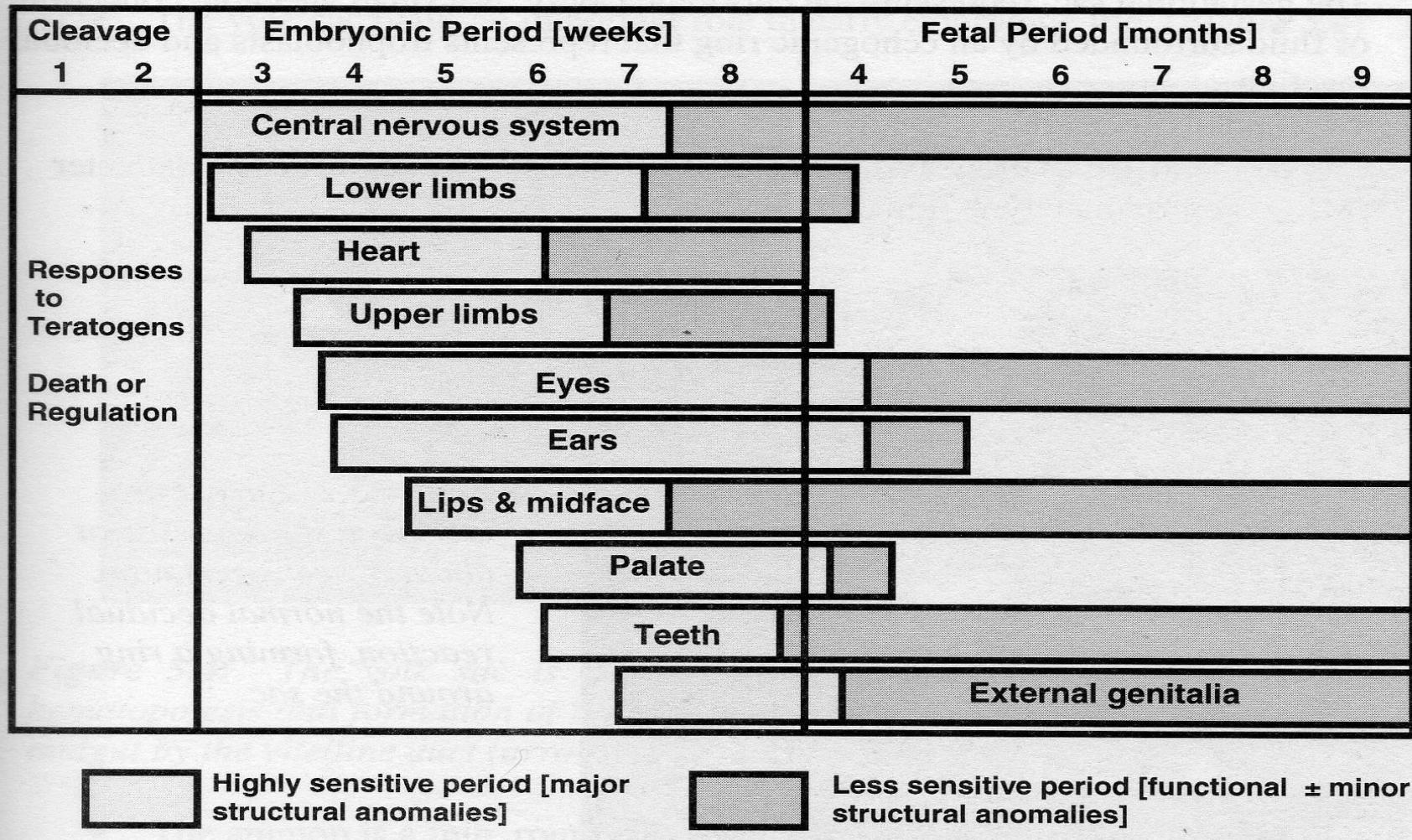


Perkembangan Janin Semasa Kehamilan



	Trimester 1	Trimester 2	Trimester 3
Waktu	0 – 12 minggu	13 – 24 minggu	25 – 38 minggu
Proses yg terjadi	Pembentukan organ vital, otak,sistem saraf jantung, jenis kelamin	Perkembangan organ vital, peningkatan volume darah, pembentukan tulang.	Perkembangan organ vital, penambahan bobot bayi, pembentukan tulang
Nutrisi yg dibutuhkan	Asam Folat (u/ pencegahan NTD), Vitamin A, B1, B6, B12, Vit E	asam folat, DHA dan ARA, Fe, Ca, Vit E	DHA >> , asam folat, kalsium, Vit B1, B2, B6, Iodium, Zinc

The first trimester that fetus is most vanurable



TRIMESTER 2



TRIMESTER 3



+ Kalori 450-
500 kkal /
hari

Pertahankan
Pola makan:
Jadwal & Jenis

Praktis:
+ 300-350
gram Nasi
setiap hari

Atau:
+ 1 porsi
makan lengkap
kemudian
dibagi 3 kali
makan

RECOMMEND TOTAL WEIGHT GAIN RANGES FOR PREGNANT WOMEN BY PREPREGNANCY BMI

PREPREGNANCY WIGHT FOR HEIGHT	BMI	RECOMMENDED TOTAL WEIGHT GAIN	
		KG	LB
UNDERWEIGHT	< 19,8	12,5 - 18	28 - 40
NORMAL WEIGHT	19,8 - 26,0	11,5 - 16	25 - 35
OVERWEIGHT	>26,0-29,0	7 - 11,5	15 - 25
OBESE	> 29,0	< 7	< 15



DIFFERENT AMOUNT OF
WEIGHT GAIN
BASED ON THE
PREPREGNANCY WEIGHT
FOR HEIGHT
OR
BMI (BODY MASS INDEX)



**UNDERWEIGHT
with
LOW WEIGHT GAIN**



**LOW BIRTH WEIGHT / IUGR
DECREASE OF IMMUNOCOMPETENCE
INCREASE OF PERINATAL / INFANT
MORBIDITY AND MORTALITY**



OVERWEIGHT
with
HIGH WEIGHT GAIN

MACROSOMIC BABIES

CEPHALOPELVIC DISPROPORTION

DISTOCIA

Trimester 1

Basic	Pemeriksaan Fisik	Inspekulo serviks
	USG Transvaginal Tujuan : 1.Deteksi kelainan kepala 2.Pemastian usai hamil	GS:intrauterin CRL :Taksiran partus BPD :struktur otak Diameter YS 3-7 mm DJJ > 90 dpm NT < 3 mm (11-14 minggu) + nasal bone 4 Chamber (optional) Abdomen omfalokel fisiologis harus hilang > 11 minggu Panjang serviks (bila riw. Inkompetensi serviks & persalinan preterm)
	Laboratorium	DPL (Hb, Ht, L, Tr, E, Rt, MCV, MCH, MCHC, RDW) ABO+Rh Ferritin Progesteron (< 10 minggu, bila ada risiko)
Medium	+ Laboratorium	+ GTT, TSH+FT4, HbsAg+anti HBsAg, HIV, HCV (riw. IDU, transfusi, rawat operatif) Serum Protein elektroforesa

Trimester 2

Basic	USG	Fetal growth chart, kelainan kongenital (struktur), 4 chamber view, genitalia a.uterina (notching) Panjang serviks Lokalisasi plasenta (implantasi plasenta terutama bekas SC, clear zone/batas plasenta & miometrium jelas)
	Laboratorium	DPL Feritin TTGO HbsAg, HIV
Medium	+Laboratorium	GTT + Insulin resistensi
Optimum	+Laboratorium	Ulang serologi : serokonversi + Insulin 0/2 jam + hsCRP

Trimester 3

Basic	USG	Fetal growth chart, kelainan kongenital (struktur) tertentu (mis.: obstruksi usus), 4 chamber view, Indeks air ketuban Plasenta (Lokalisasi plasenta implantasi plasenta terutama bekas SC) Arteri umbilikus (+ a.serebri media + ductus venosus) Tebal SBU pada bekas SC (32 minggu) Fetal well being (FDJP) hanya dikerjakan pada kasus-kasus tertentu
	+Laboratorium	Cek ulang DPL, ferritin Kultur urin bila terdapat nitrit & bakteri pada UL
Medium	+ Laboratorium	Hs CRP
	+ Laboratorium	TTGO + Insulin + SPE + APTT + PT

Aim for Nutritional Adequacy

Variety

- Provide all the essential macronutrients (e.g. protein) and micronutrients (e.g. folic acid)

Balance

- Eat food from all the food groups, according to the recommended daily servings

Moderation

- Moderation is the key to an enjoyable life and good health

Choosing A Maternal Nutrition Supplement

There are basically 2 types:

- Pills
 - Only vitamins and minerals
- Maternal milk products
 - Provides additional energy, protein, essential fats, fibre, vitamins and minerals



Meeting Energy Needs

Incremental Energy

trimester

No increase

Second trimester

+ 340 kcal / day (+~20%)

Third trimester

+ 452 kcal / day (+~30%)

Age: **30 years**

Weight before pregnancy: **50 kg**

Height: **1.52 m**

Activity level: **Sedentary**

Energy needs:

1st Trimester: ~ 1700 kcal

2nd Trimester: ~ 2050 kcal

3rd Trimester: ~ 2170 kcal

Meeting Carbohydrate Needs

Recommendation

- The acceptable range of intake is between 45 - 65% of calories

For best nutritional value,
select

- Wholegrain foods
 - wholemeal or multi grain bread, wholemeal pasta, brown rice, wholegrain biscuits, wholegrain cereals, oats
- Fruit
- Vegetables

Case study

Carbohydrate needs

1st Trimester: ~ 258 g

2nd Trimester: ~ 285 g (+11%)

3rd Trimester: ~ 314 g (+22%)

*Reference: USA DRIs, National Academy
of Sciences, 2004*

Meeting Protein Needs

Recommendation

- The acceptable range of intake is between 10 – 35% of calories
- Require 55% more per day during pregnancy
- Protein builds the placenta and the maternal and fetal tissues

best nutritional value,
select

- Low fat milk
- Fish
- Skinless chicken
- Lean meat
- Eggs
- Legumes
- Nuts
- Seeds

Case study

Protein needs

1st Trimester: 64 g

2nd Trimester: 100 g (+56%)

3rd Trimester: 100 g (+56%)

Reference: USA DRIs, National Academy
of Sciences, 2004; Present Knowledge in
Nutrition, ILSI Press, 2006

Meeting Fat Needs

Recommendation

- The acceptable range of intake is between 20 – 35% of calories
- Require 20% more per day during pregnancy

For best nutritional value

- Select

- Polyunsaturated fats
 - Omega 3 Fat - DHA
- Monounsaturated fats

- Reduce

- Saturated fat
- Trans fats

Case study

Fat needs

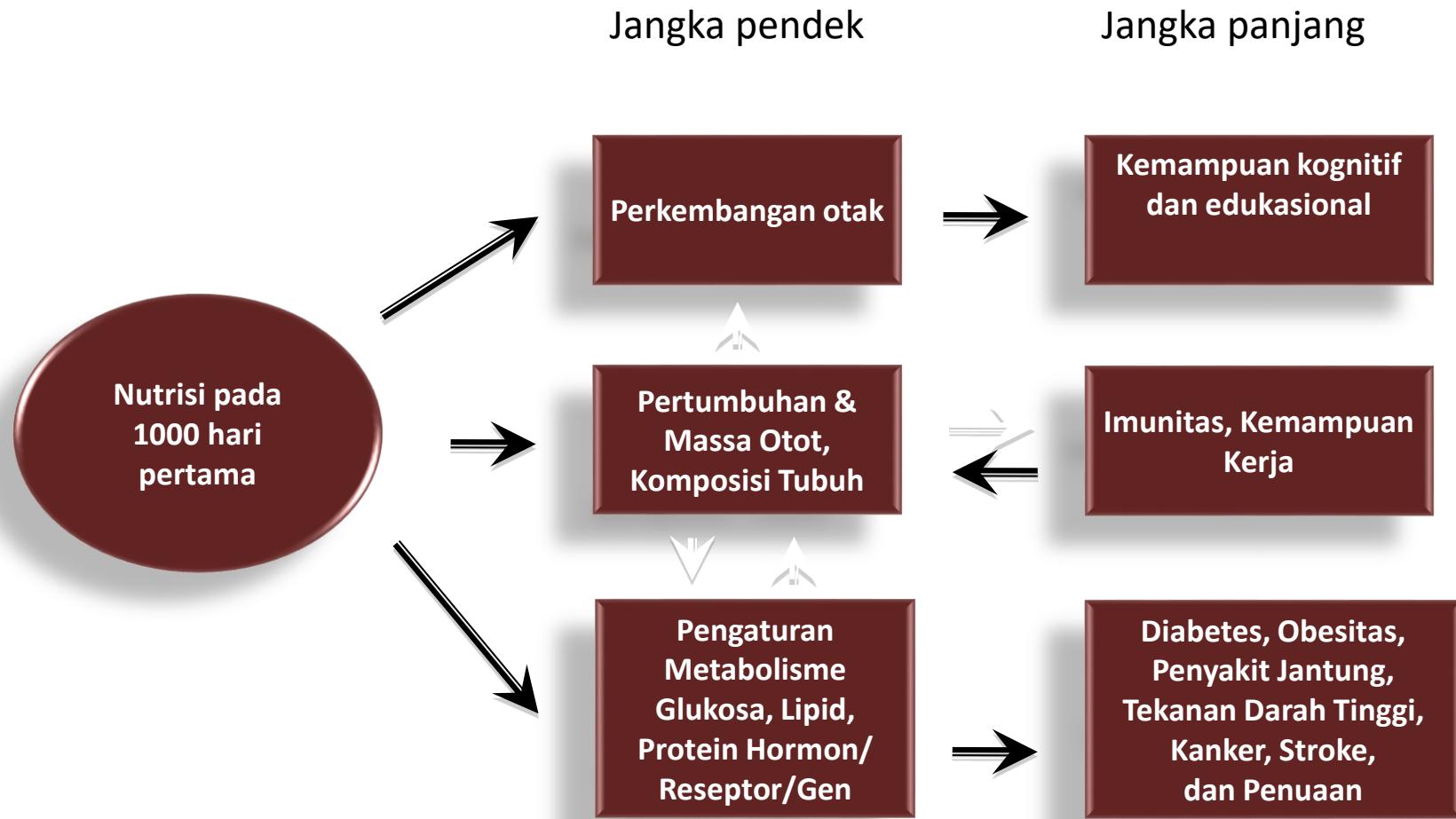
1st Trimester: 48 g

2nd Trimester: 58 g (+20%)

3rd Trimester: 58 g (+20%)

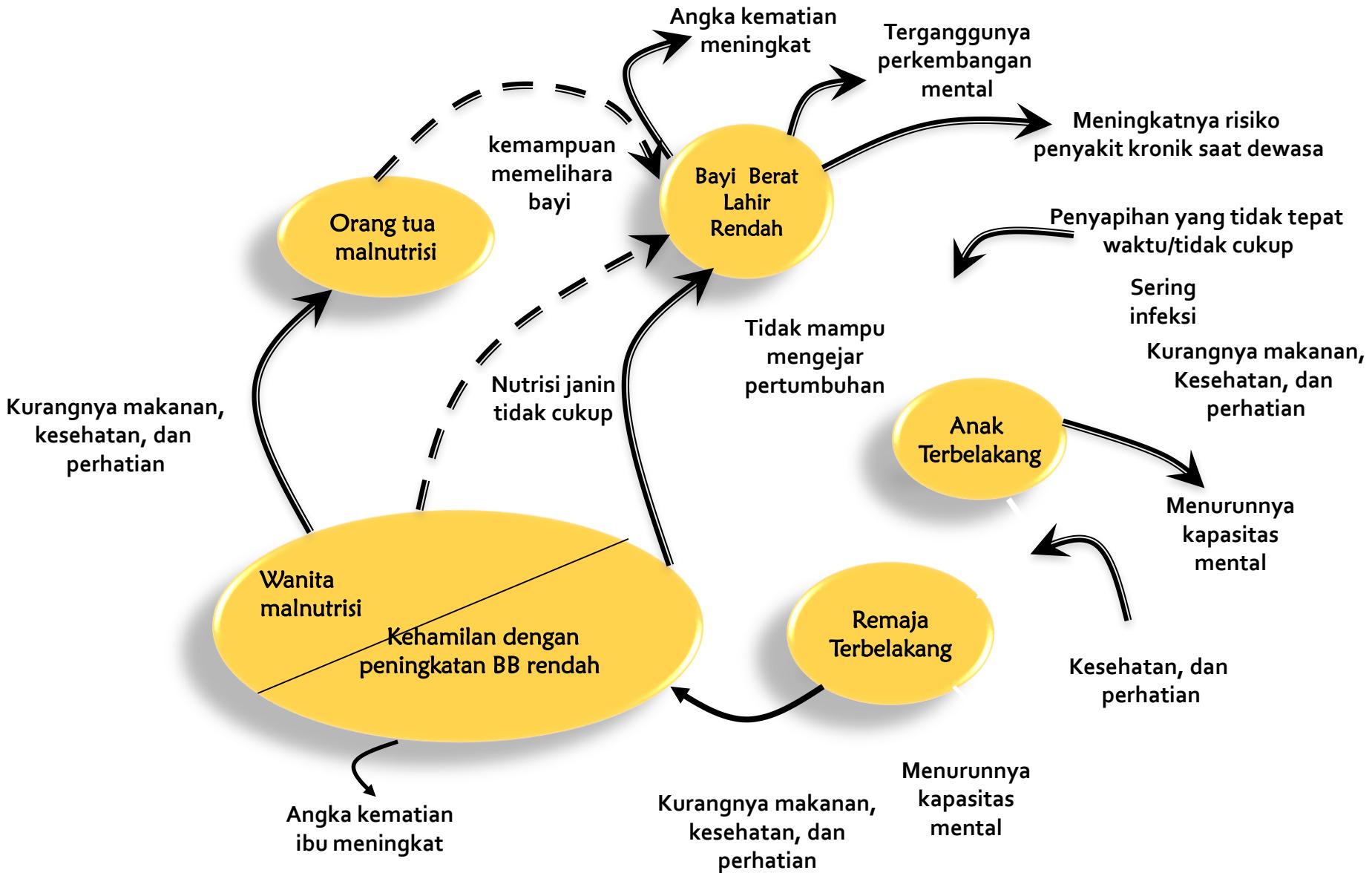
Reference: USA DRIs, National Academy of Sciences, 2004

Efek Jangka Pendek dan Jangka Panjang Pemberian Nutrisi 1000 hari



Source:UNICEF State of the World 's Children 2001

NUTRISI DALAM SIKLUS KEHIDUPAN



National Research Council Recommended Daily Allowances For Women Before & During Pregnancy and Lactation

NUTRIENT	NONPREGN.	PREGNANT	LACTATION
Calories (Kcal)	2200	2500	2600
Protein	55	60	65
Fat Soluble Vit.			
A (μg)	800	800	1300
D (μg)	10	10	12
E (mg-TE)	8	10	12
K (μg)	55	65	65
Water Sol. Vit.			
C (μg)	60	70	95
Folate (μg)	180	400	280
Niacin (μg)	15	17	20
Riboflavin (mg)	1,3	1,6	1,8
Thiamin B1 (mg)	1,1	1,5	1,6
Pyridox. B6 (mg)	1,6	2,2	2,1
Cyanocobalamin	2,0	2,2	2,6

National Research Council Recommended Daily Allowances For Women Before & During Pregnancy and Lactation

NUTRIENT	NONPREGN.	PREGNANT	LACTATION
Mineral			
Calcium (mg)	1200	1200	1200
Phosphorus (mg)	1200	1200	1200
Iodine (μ g)	150	175	200
Iron (mg)	15	30	15
Magnesium (mg)	280	320	355
Zinc (mg)	12	15	19

Proper nutrition

- Major Nutrients
 - Carbohydrates 60-70%
 - Protein 10-20%
 - Fat 20-25%
 - Vitamins
 - Minerals
 - Water

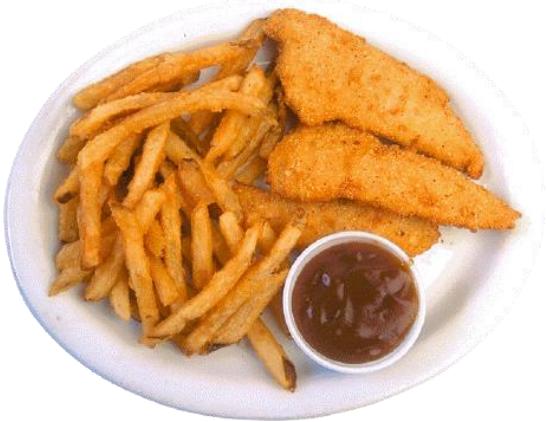
Carbohydrates

- Sugars and starches
- Body's primary source of energy
- Fruits, breads, some vegetables, grains, milk
- Should make up 60-70% of total daily calories
- Carbohydrates do not make you fat



Fat

- Source of stored energy burned during activity
- Makes you feel full and no longer hungry
- Helps the body absorb fat soluble nutrients
- Choose healthy fats
- 20-25% of total calories (use sparingly)
- Contains most calories per gram



Protein

- Builds and repairs the body
- Used for energy if the diet is inadequate in carbohydrates
- Found in fish, poultry, meats, tofu, nuts, beans, eggs, milk, cheese
- Need ~10 grams more per day in pregnancy
- 10-20% of total calories



Water

- 60-75% of body weight
- Stabilizes body temperature
- Carries nutrients to and waste away from cells
- Needed for cell function
- 8-10 cups/day



Fiber



- Fiber: Whole grains, fruits, vegetables
 - Wheat bread: check the label
 - Fruit vs. Juice
- Stabilizes blood sugar
- Protection from diabetes, constipation and diverticulosis
- lowers LDL cholesterol
- 25-35 grams/day

Important nutrients for pregnancy

- Folate
- Iron
- Calcium
- Vitamin D
- Vitamin A
- Essential Fats

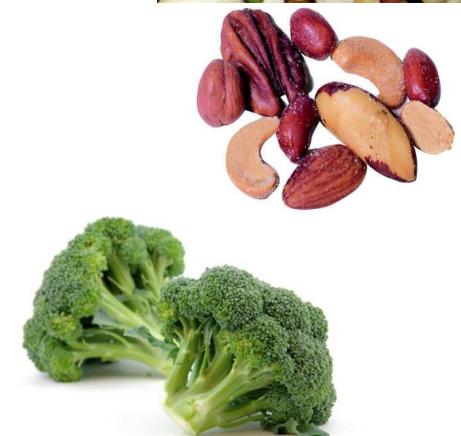
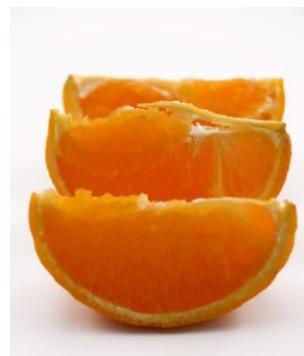
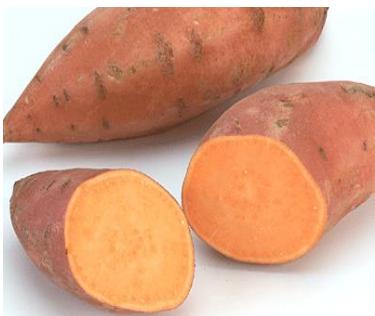
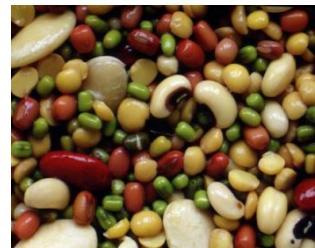




Folate



- Why is it important in pregnancy
 - Needed for the brain to grow
 - Not enough - the baby could get neural tube defects
- What foods is it in?
 - Whole grains, vegetables and fruit, beans, nuts.
 - Multivitamin needed to get enough





Iron



is it important in pregnancy

- To make more blood to feed the growing baby
- Not enough - you may be tired and the baby may not grow well
- What foods have iron?
- Meat, poultry, fish, beans, traditional meats, enriched grains and cereals





Calcium

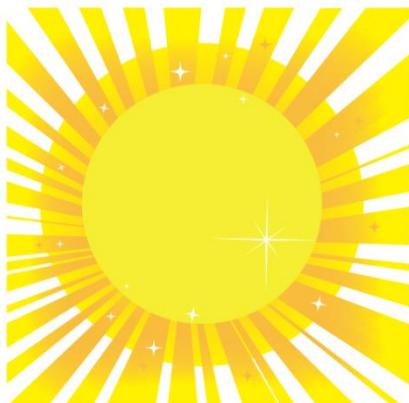


- Why is it important during pregnancy?
 - So the baby can grow strong bones and teeth
 - To keep the mom's bones and teeth strong too
- What foods have calcium?
 - Milk, skim milk powder, yogurt, cheese, soy milk, canned salmon with bones, bannock



Vitamin D

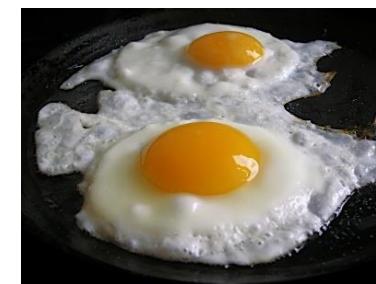
- Why is it important in pregnancy?
 - It helps our body use calcium that we eat
 - Helps build strong bones for the baby and mom
- What foods have vitamin D
 - Milk, soy milk, oily fish, margarine
 - Your skin also makes it from the sun!





Vitamin A

- Why is it important in pregnancy?
 - Need enough for healthy growth
 - Too much can cause birth defects
- What foods have safe amounts of vitamin A?
 - Dark green and orange vegetables, milk, eggs, salmon, butter
- What foods have too much vitamin A?
 - Liver, supplements with vitamin A

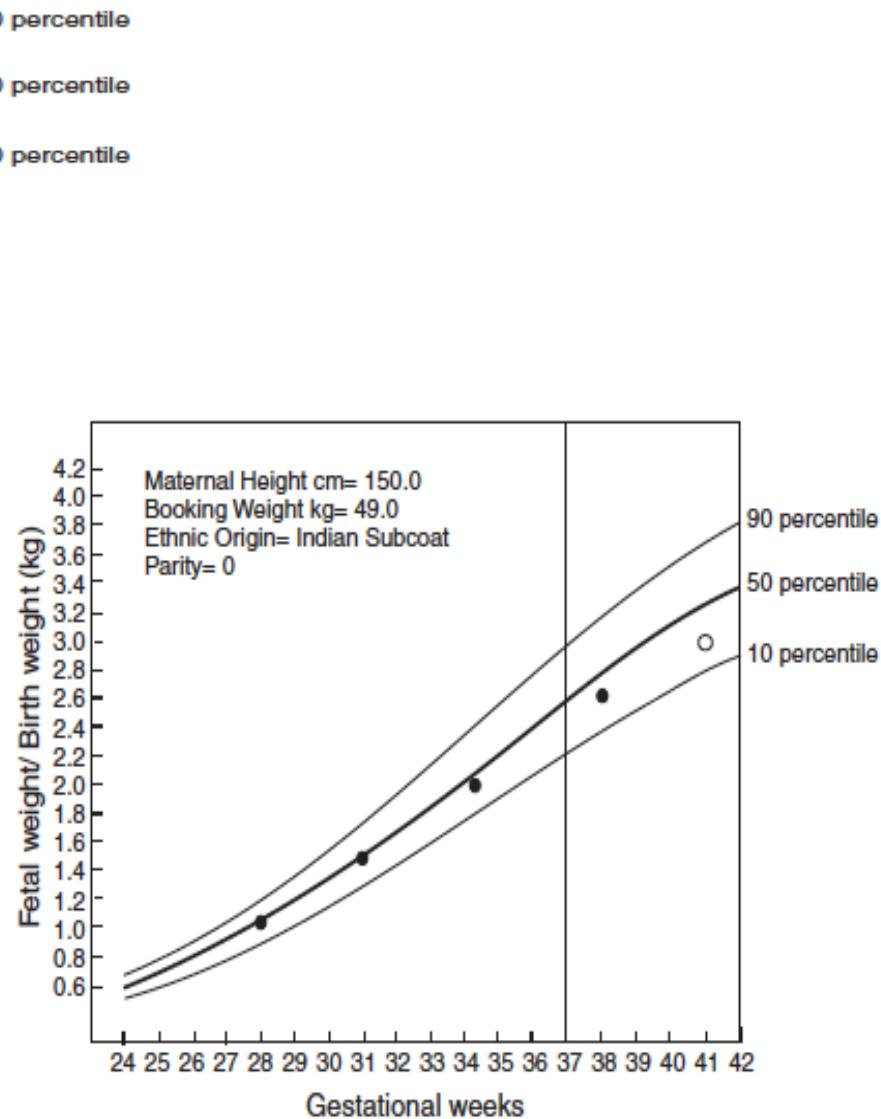
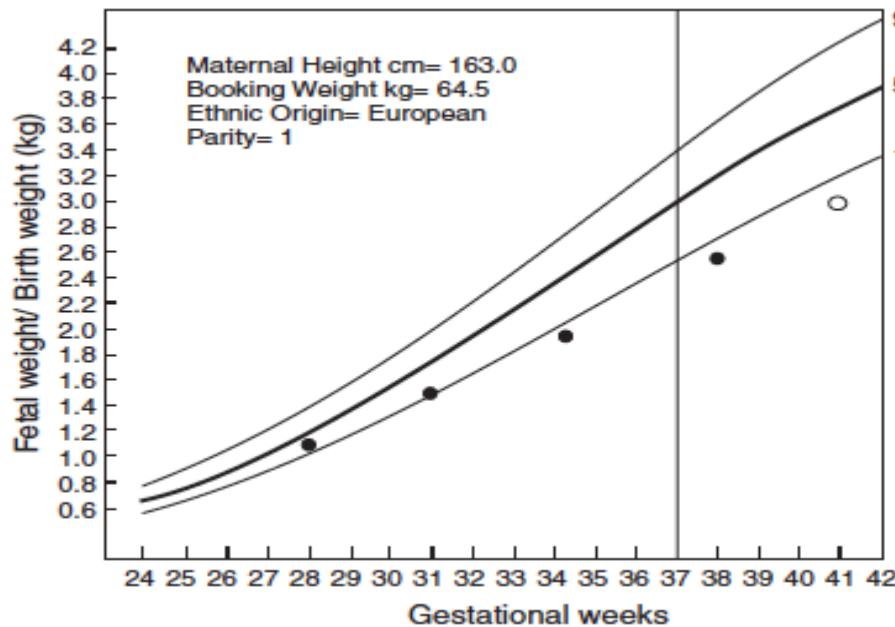


Essential Fats

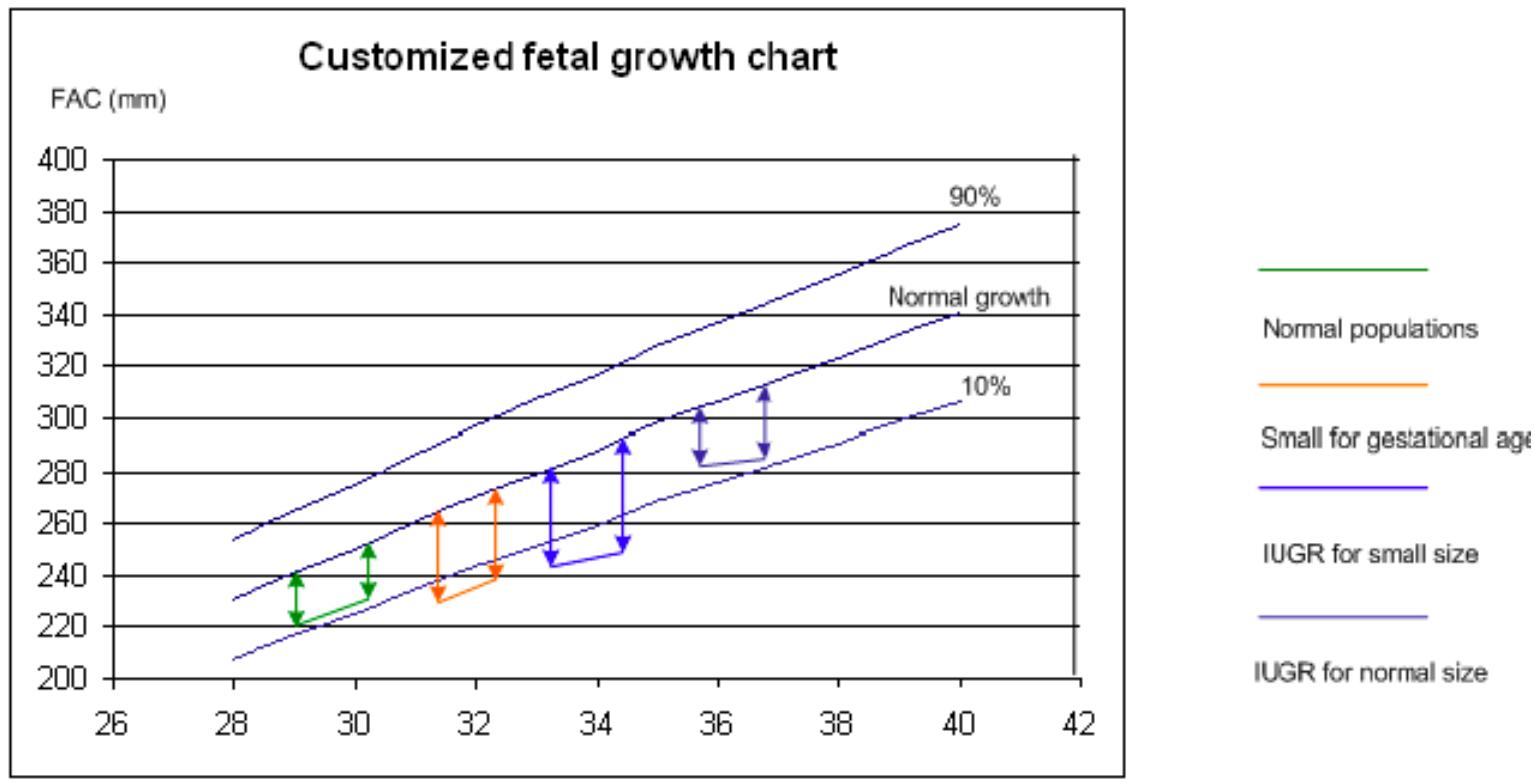
- Why are they important in pregnancy?
 - They are needed for the baby's brain and eyes.
- What foods have essential fats?
 - Vegetable oil, (non-hydrogenated) margarine, oil salad dressings, meats, poultry, fish, nuts & seeds.



Customized fetal growth chart



Customized fetal growth chart



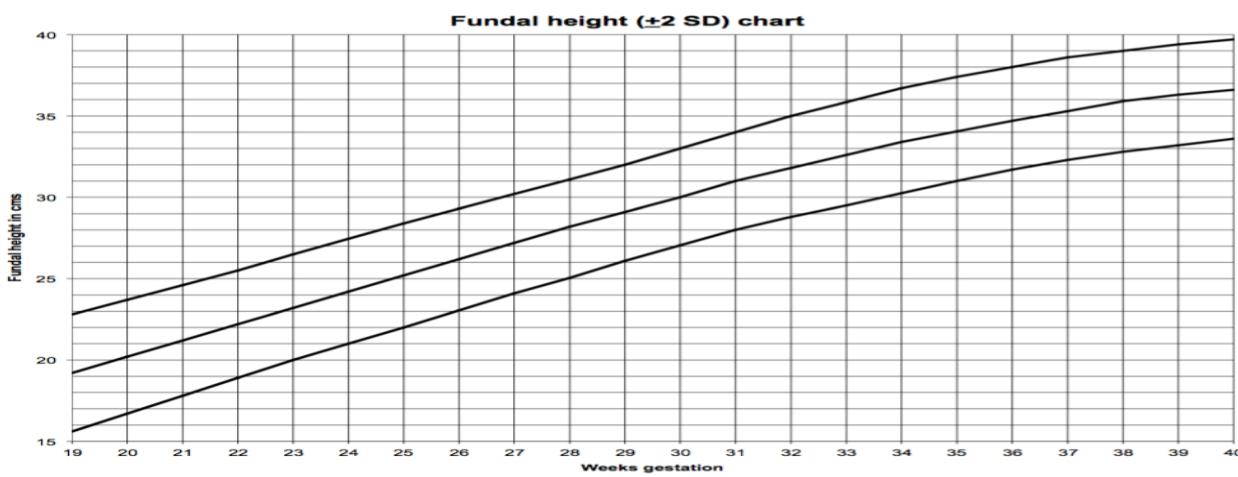
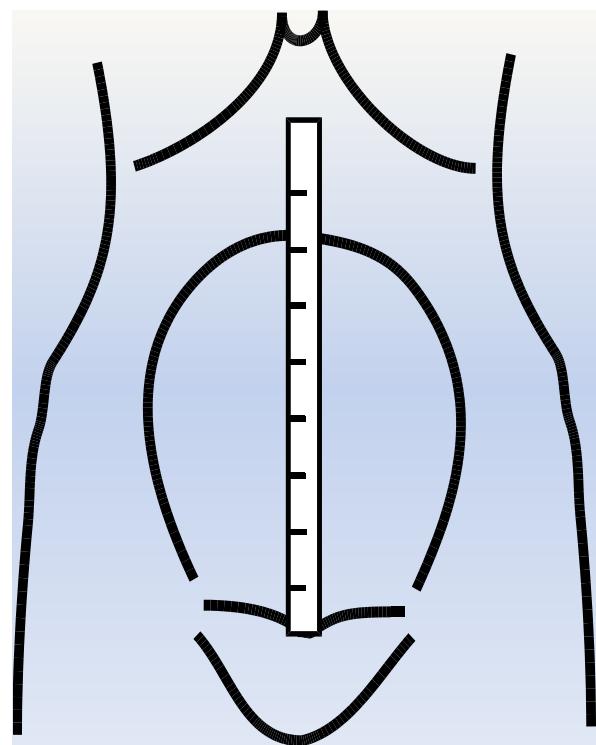


Pesan yang dibawa pulang

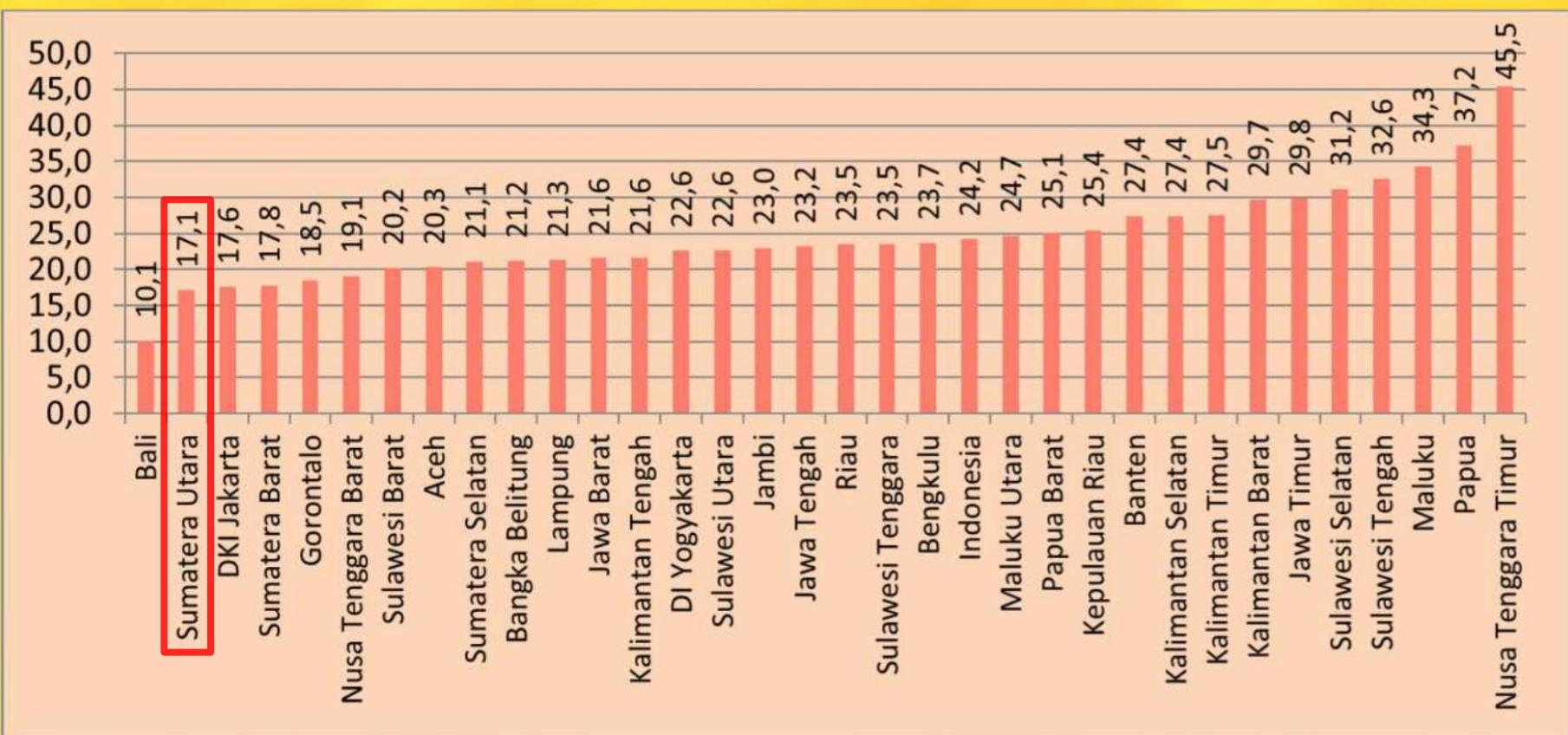
1. kenaikan berat badan yang baik selama kehamilan akan menghasilkan pertumbuhan janin yg optimal dan laktasi yang sukses
2. Pertambahan berat badan yang berbeda-beda sesuai dengan BMI pada saat sebelum hamil
3. Kenaikan berat badan pada trimester II lebih bermakna dalam menambah kenaikan berat badan janin
4. Persiapan kesehatan reproduksi, nutrisi dan asupan multivitamin serta asam folat prakonsepsi

5. Penggunaan Omega 3 selama kehamilan akan meningkatkan berat badan janin, menurunkan risiko preeclampsia serta gangguan neural dan visual janin
6. Fish oil merupakan sumber utama Omega 3 yang dibutuhkan selama kehamilan
7. Protein, kalori dan multivitamin secara bersama-sama merupakan komponen yang penting dalam mempengaruhi lauran janin dibanding satu jenis nutrisi

terimakasih



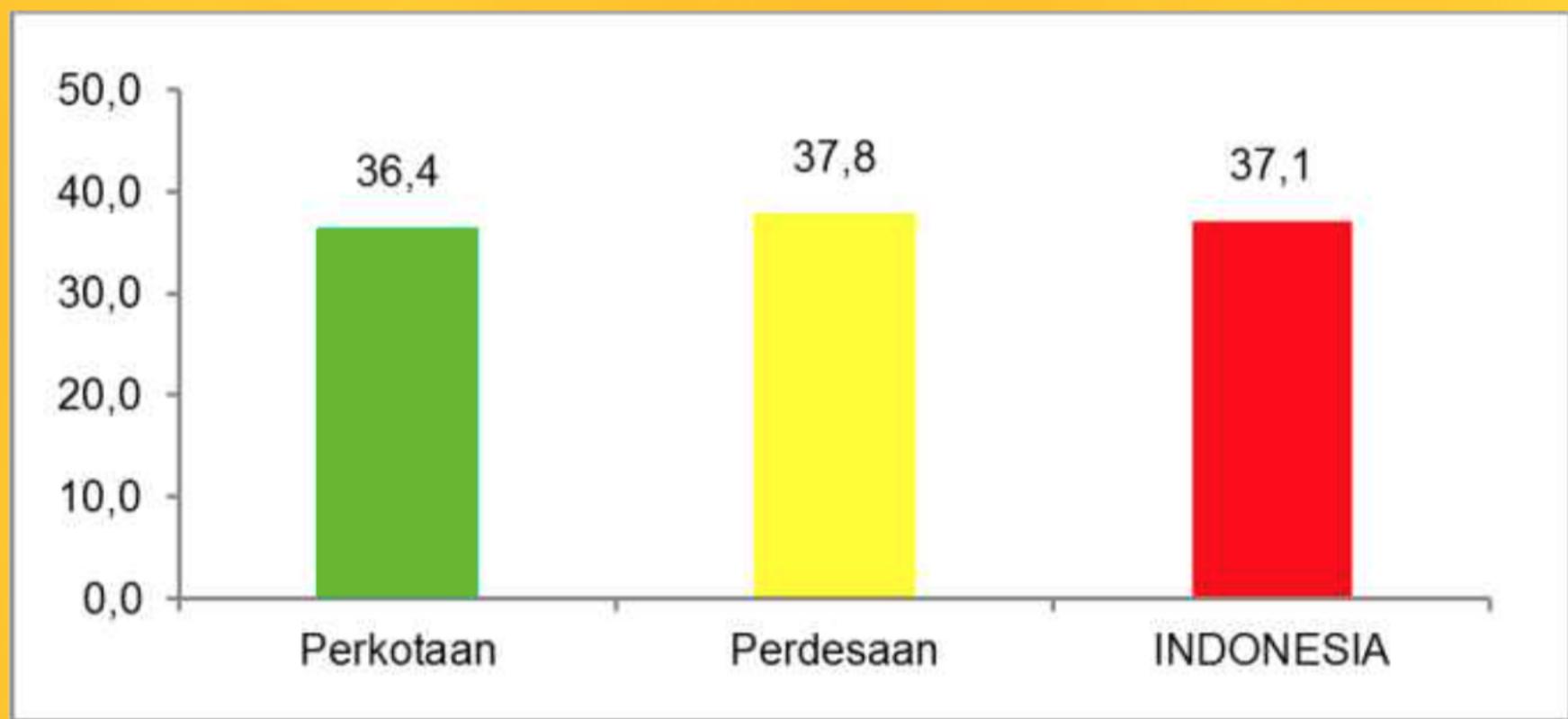
Gambar 3
Proporsi Ibu Hamil dengan LILA<23,5cm Menurut Provinsi Tahun 2013



Sumber : Riskesdas 2013

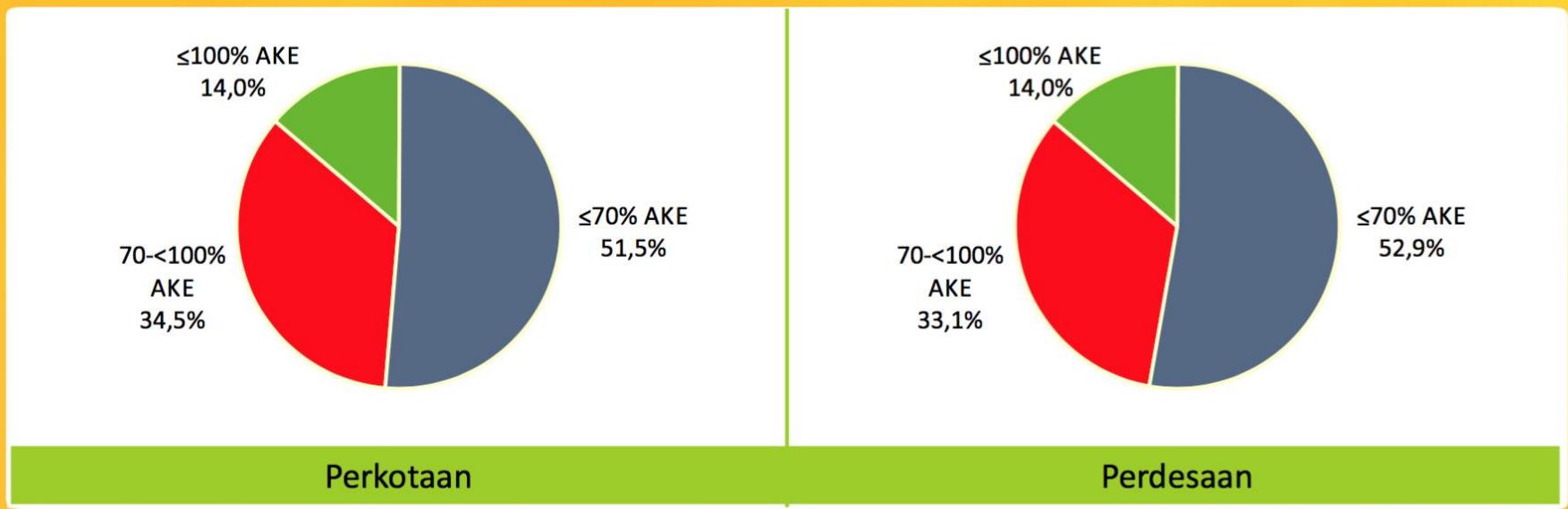
Gambar 4

Proporsi Anemia pada Ibu Hamil menurut Tempat Tinggal Tahun 2013



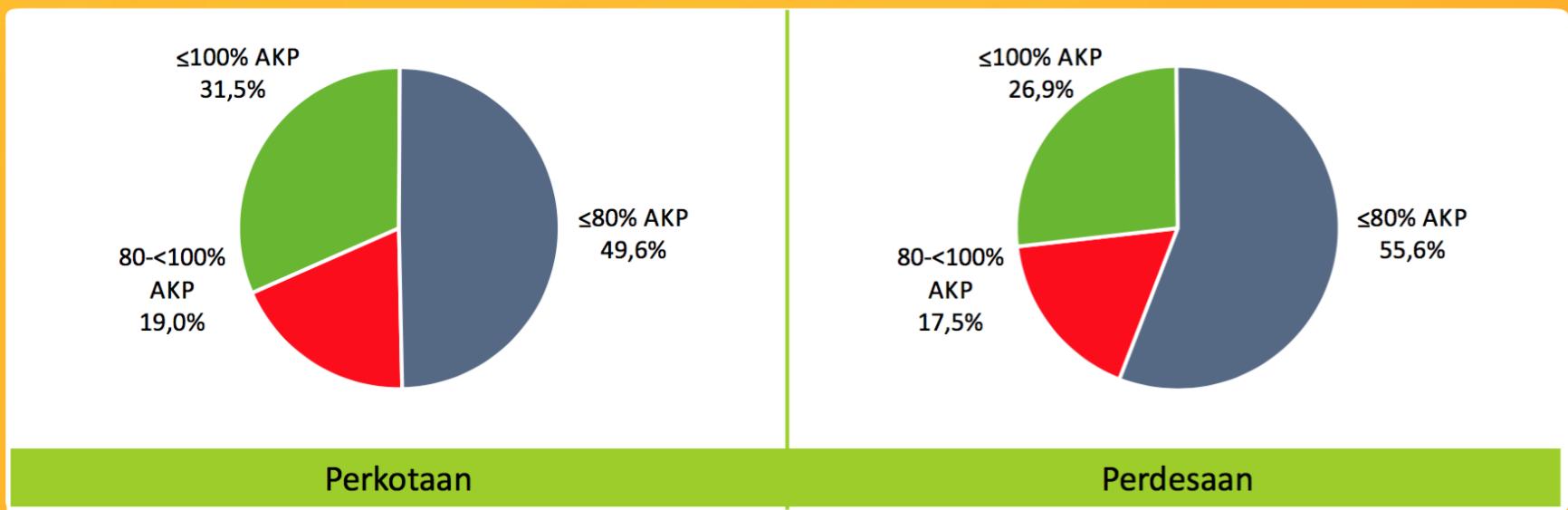
Sumber : Riskesdas 2013

Gambar 5
Proporsi Tingkat Kecukupan Energi Ibu Hamil di Indonesia Tahun 2014



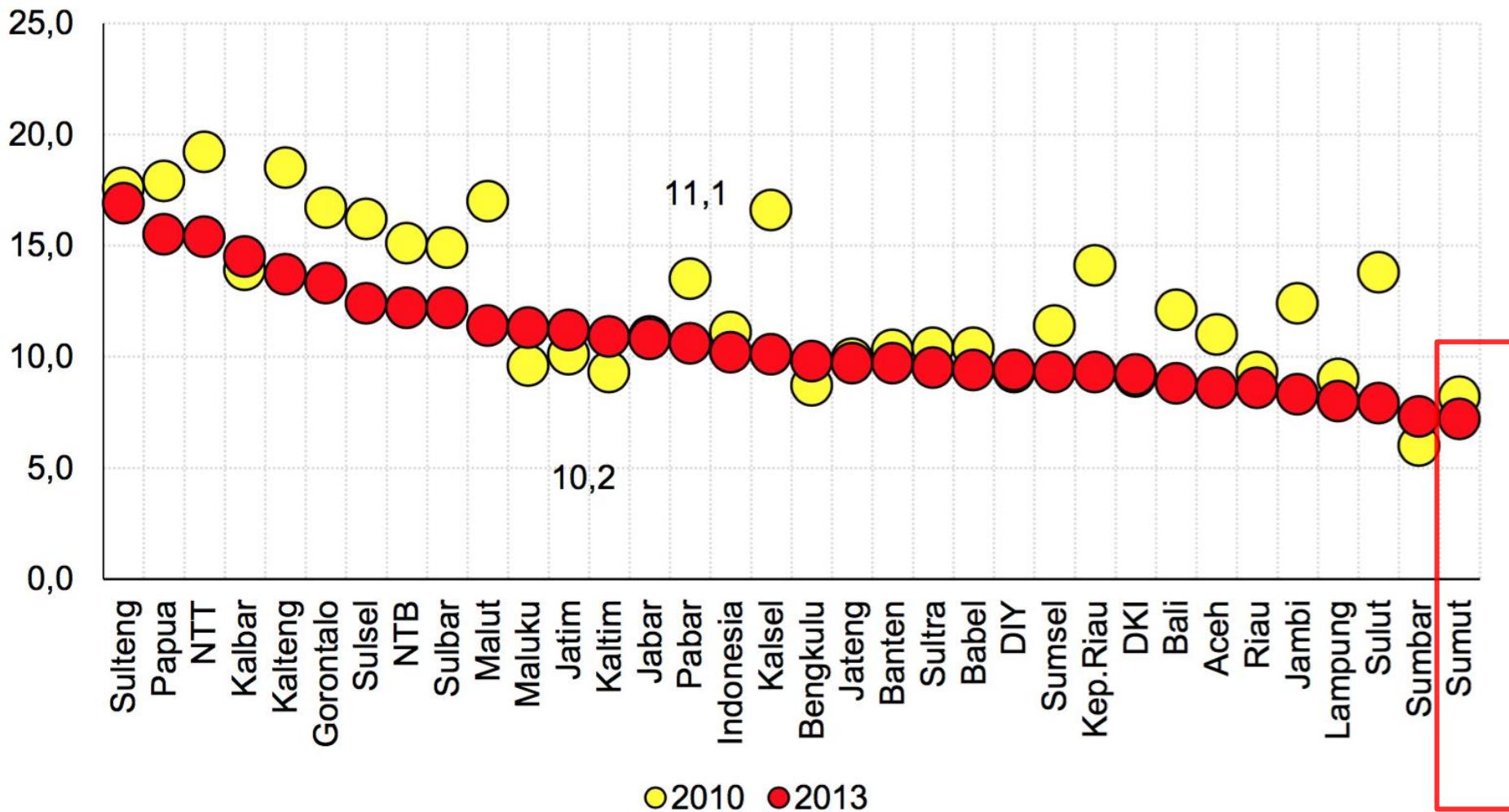
Sumber : SDT 2014

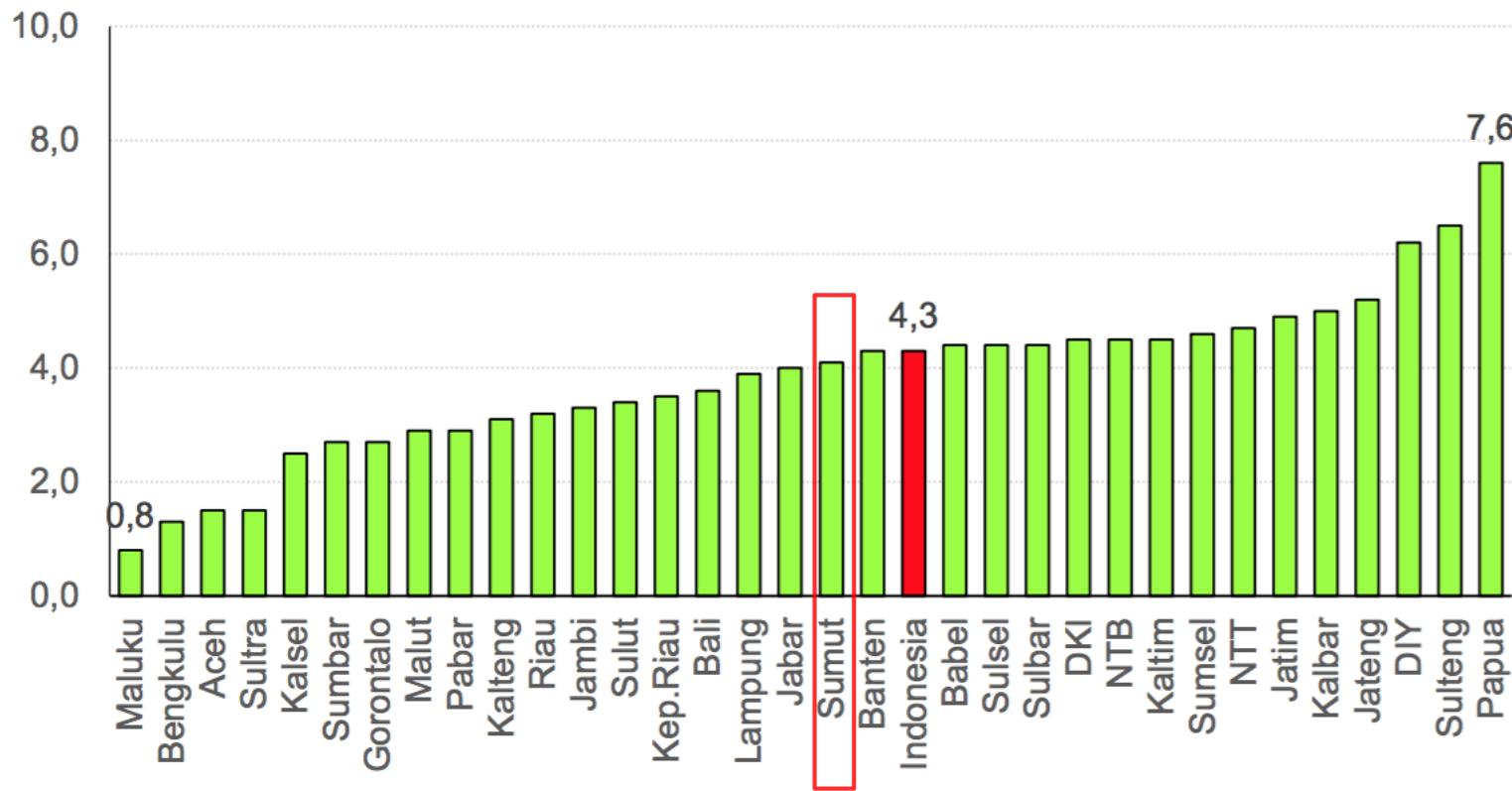
Gambar 6
Proporsi Tingkat Kecukupan Protein Ibu Hamil di Indonesia



Sumber : SDT 2014

Berat badan lahir rendah < 2500 gr

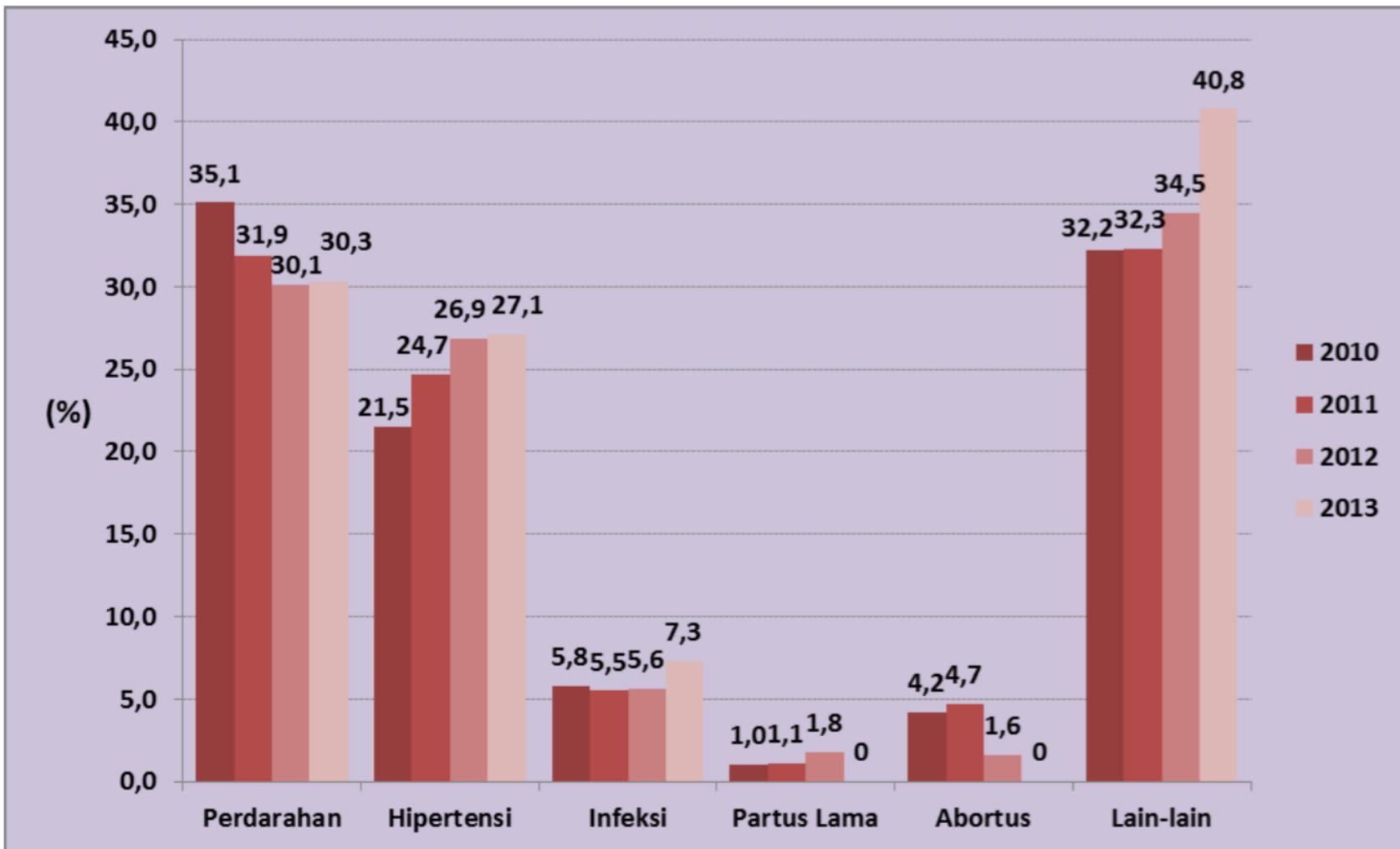




Gambar 3.13.2

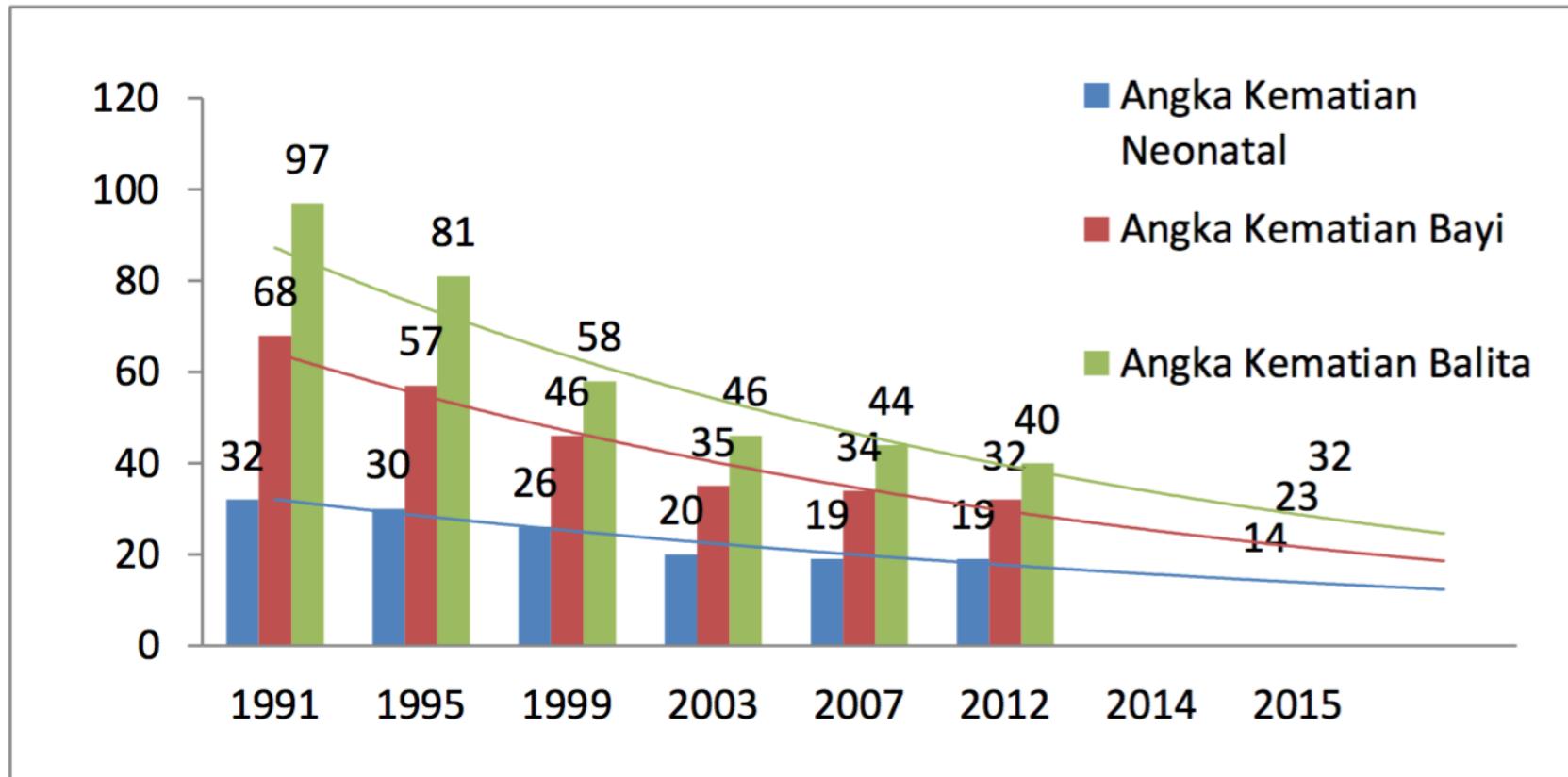
Persentase umur 0-59 bulan dengan berat badan lahir <2500 gram dan panjang badan lahir <48 cm menurut Provinsi, Indonesia 2013

GAMBAR 5.16
PENYEBAB KEMATIAN IBU DI INDONESIA
TAHUN 2010 - 2013



Sumber: Ditjen Bina Gizi dan KIA, Kemenkes RI, 2014

GAMBAR 5.24
TREN ANGKA KEMATIAN NEONATAL, BAYI, DAN BALITA



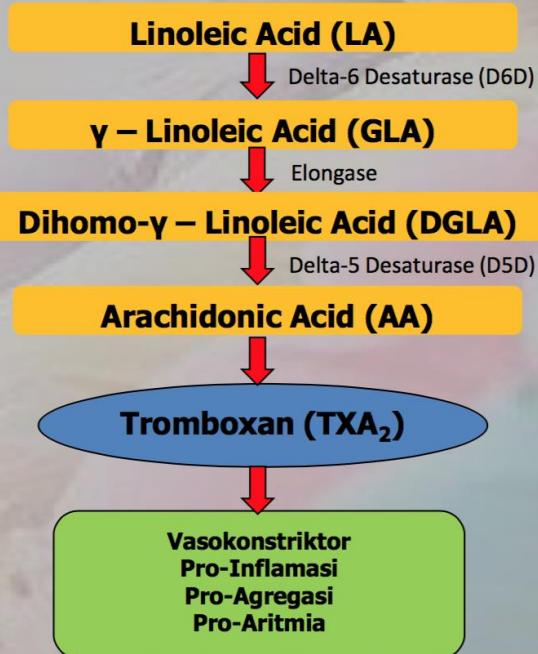
Sumber: Ditjen Gizi dan KIA, Kemenkes RI, 2015

Omega -3 baik dikonsumsi dari awal kehamilan sampai menyusui karena:

- ◆ Dapat mengoptimalkan perkembangan otak dan sel syaraf janin/bayi⁽¹⁾
- ◆ Mencegah terjadinya preeklampsia pada saat kehamilan⁽²⁾⁽³⁾
- ◆ Omega -3 yang baik **tidak mengandung AA**, karena AA dapat meningkatkan resiko terjadinya preeklampsia saat kehamilan⁽⁴⁾

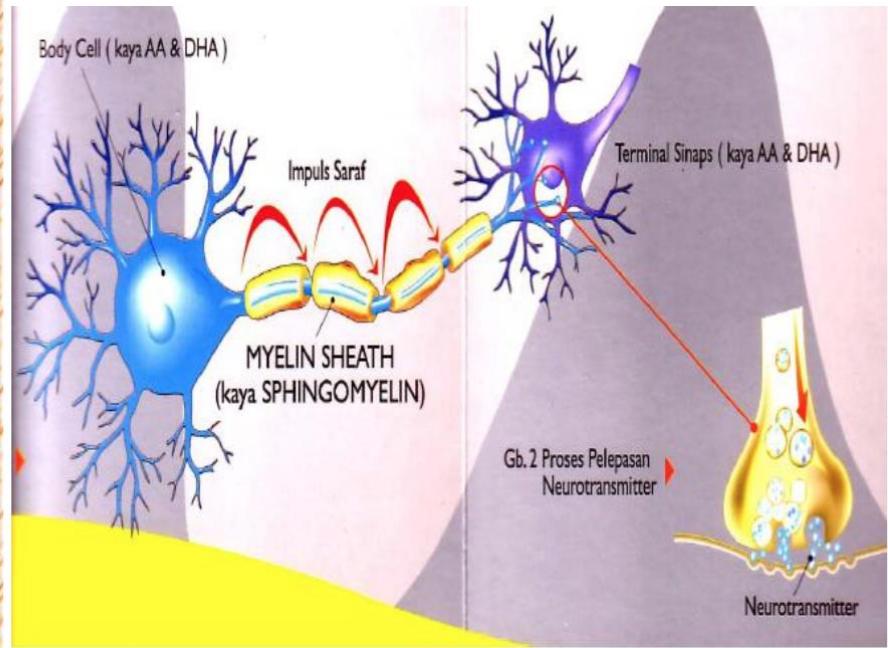
Referensi:

1. Morse, Nancy L; Benefits of Docohexanoic Acid, Folic Acid, Vit D and Iodine on Foetal and Infant Brain Development and Function Following Maternal Supplementation during Pregnancy and Lactation; Nutrients. 2012.
2. Mahomed et al; Erythrocyte Omega-3, Omega-6 and Trans Fatty Acids in Relation to Risk of Preeclampsia among Women Delivering at Zimbabwe; Physiological Research.2007.
3. Kulkarni et al; Reduced placental docosahexaenoic acid levels associated with increased levels of sFlt-1 in preeclampsia,2010.
4. Patterson et al; Health Implications of High Dietary Omega-6 Polyunsaturated Fatty Acids; Journal of Nutrition and Metabolism.2011,



DHA (Docosahexaenoic acid)

Docosahexaenoic acid (DHA) adalah
asam lemak esensial (omega 3) pembentuk membran sel
otak dan retina mata.



- Sekitar 60% dari massa otak, terdiri dari lemak (lipid), DHA merupakan komponen terbanyak penyusun massa otak.



DHA

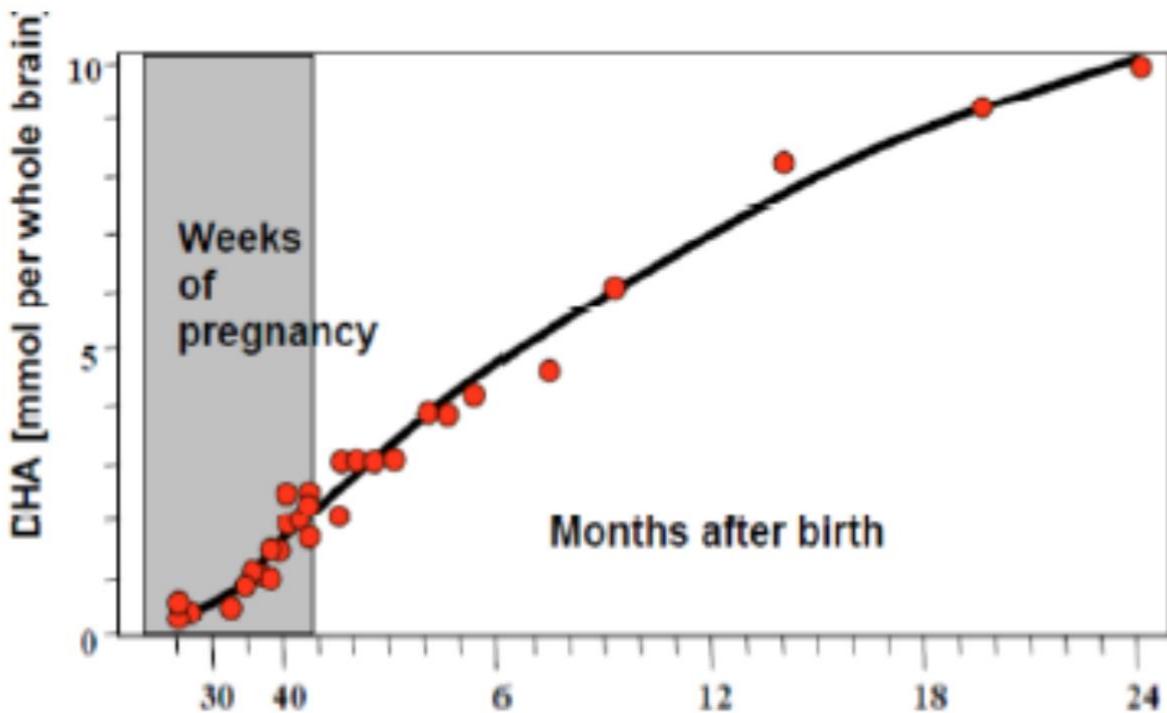


Figure 1. Docosahexaenoic acid (DHA) accumulation in foetal brain [2].

- Pada trimester terakhir hingga 2 tahun awal kehidupan, DHA banyak terakumulasi secara meningkat di otak.
- Kebutuhan DHA meningkat ini untuk pertumbuhan dan perkembangan otak bayi.