

Diet, nutrients and sleep

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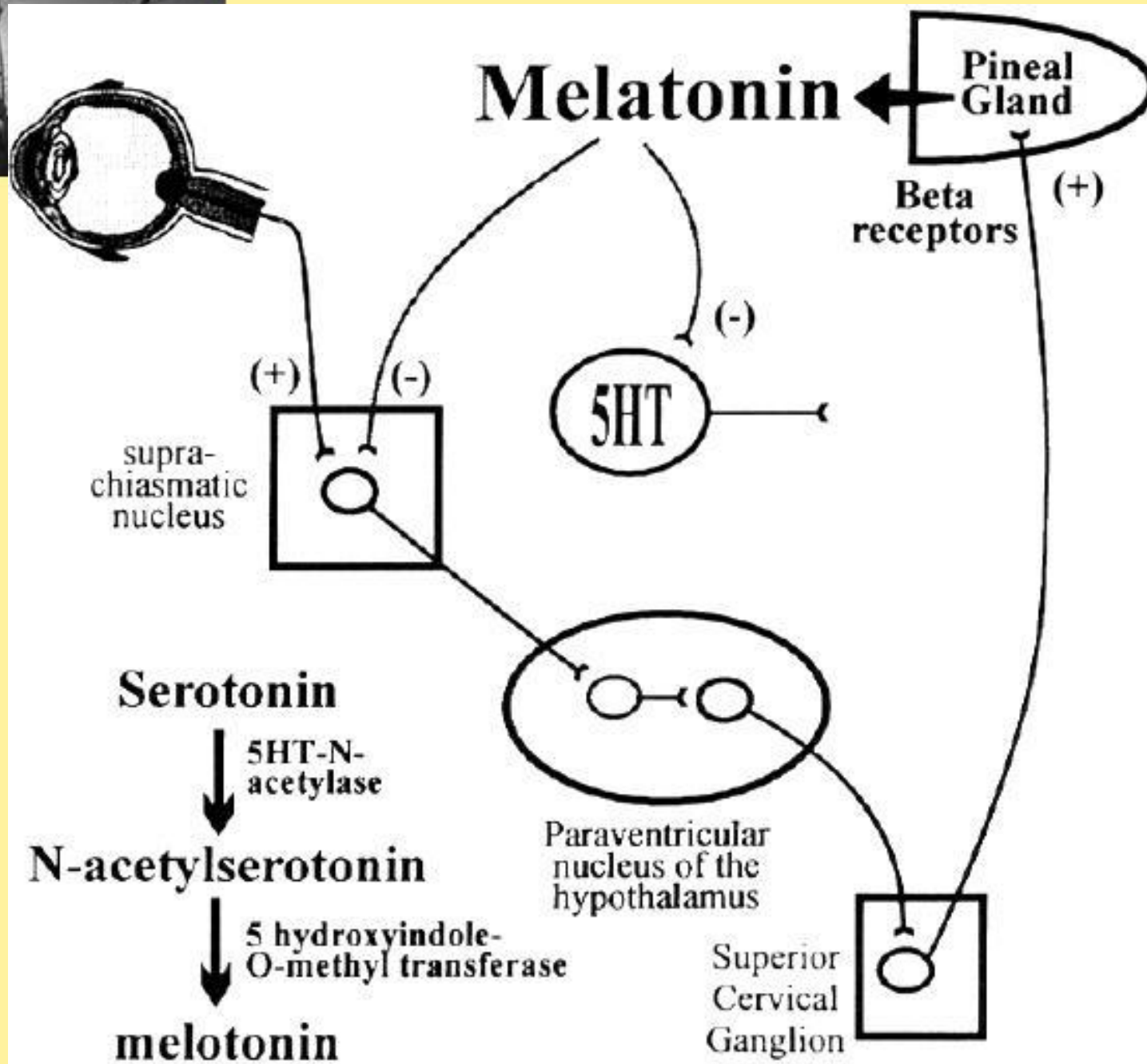
Tryptophan (L-tryptophan)

- In the brain, **tryptophan** → **serotonin**, a natural sleep-inducing chemical.
- Enhances the brain's ability to produce **melatonin**, the hormone that regulates your body's natural inner clock.
- L-tryptophan is found in foods such as milk and turkey.
- L-tryptophan, ↓ REM sleep ↑ spent in non-REM sleep.



Phosphatidylserine

- Phosphatidylserine, brain regulate the amount of cortisone produced by the adrenals.
- Helpful for those who cannot sleep because of high cortisone levels, usually induced by stress.
- Cortisone is usually at high levels in the morning, for wakefulness.
- High stress→ high cortisone, prevents sleeping.





Serotonin

- Important initiator of sleep.
- Tryptophan → serotonin
- ↑ tryptophan → ↑ serotonin levels and promote sleep.
- ↓ the time required to get to sleep



5-hydroxytryptophan (5-HTP)

- More effective than tryptophan
- Easily crosses the blood-brain barrier
- ↓ the time required to get to sleep
- ↓ the number of awakenings.
- ↑ quality of sleep, ↑ REM sleep,
- ↓ the amount of time you spend in sleep stages 1 and 2
- ↑ increasing deep-sleep stages 3 and 4, without increasing total sleep time.



5-hydroxytryptamine (5-HTP)

- Higher doses → ↑ number of disturbing dreams and nightmares due to abnormally prolonged REM sleep.
- High in carbohydrate: fruit or fruit juice near bedtime → ↑ sedative effects of 5-HTP
- **Vitamin B., niacin, and magnesium**, essential cofactors in the conversion of 5-HTP → serotonin.



Melatonin & Inositol

- Be secreted naturally by the pineal gland, mainly at night
- Sleep hormone.
- Sources: plants and in algae.
- Insomnia & in banishing jet lag.
- melatonin levels $\downarrow \rightarrow$ a sedative effect.
- **Inositol** enhances REM sleep.



- tryptophan before bedtime can induce sleepiness and delay wake times.
- 5-HTP may be useful in treating insomnia associated with depression.



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Protein concentration in food

	protein	fat	CHO	calorie	Protein%
Milk- whole milk	8	8	12	150	21.3
- skim milk	8	—	12	80	40
Veg	1	—	5	25	16
Fruit	—	—	15	60	—
Cereal	2	—	15	70	11.4
Meat- mod. fat	7	5	—	75	37.3
- low fat	7	3	—	55	50.9
Soybean	7	5	—	75	37.3
oil	—	5 Yang, SH		45	—

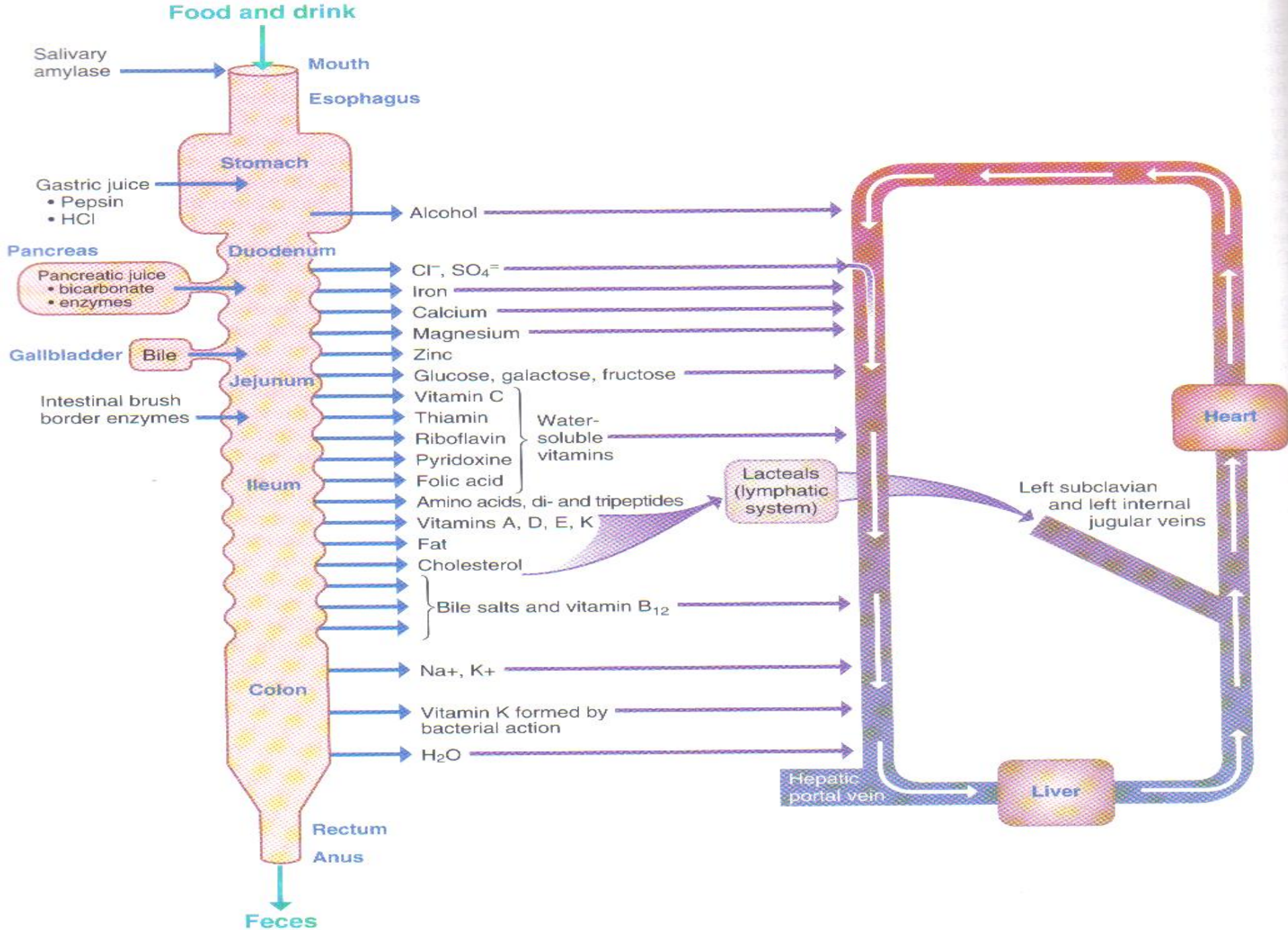


FIGURE 1-8 Sites of secretion and absorption in the gastrointestinal tract.



Calcium and magnesium

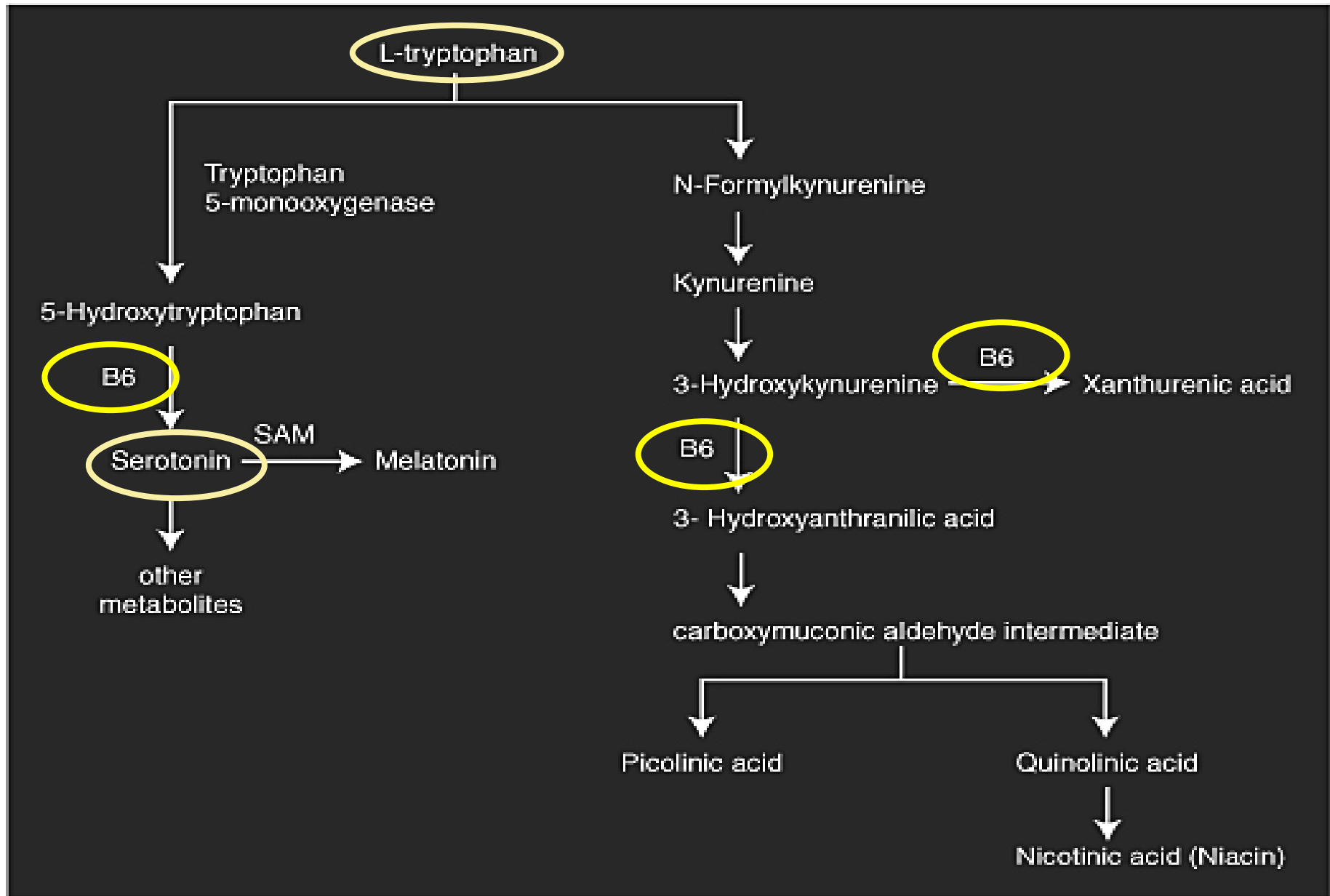
- **Calcium,**
 - a sedative effect on the body.
 - calcium deficiency → restlessness and wakefulness.
- **Magnesium**
 - essential cofactors in the conversion of 5-HTP→serotonin.
 - induce sleep
 - a component of calcium supplements
 - wheat bran, almonds, cashews, kelp, blackstrap and brewer's yeast.
 - mg deficiency → nervousness prevents sleep.

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- Ca and Mg
 - calming effects on the brain
 - essential for normal sleep
 - deficiency → leg cramps during the night.
 - 45 minutes before bedtime have a tranquilizing effect.

Figure 1. Tryptophan metabolism





Vitamin B complex

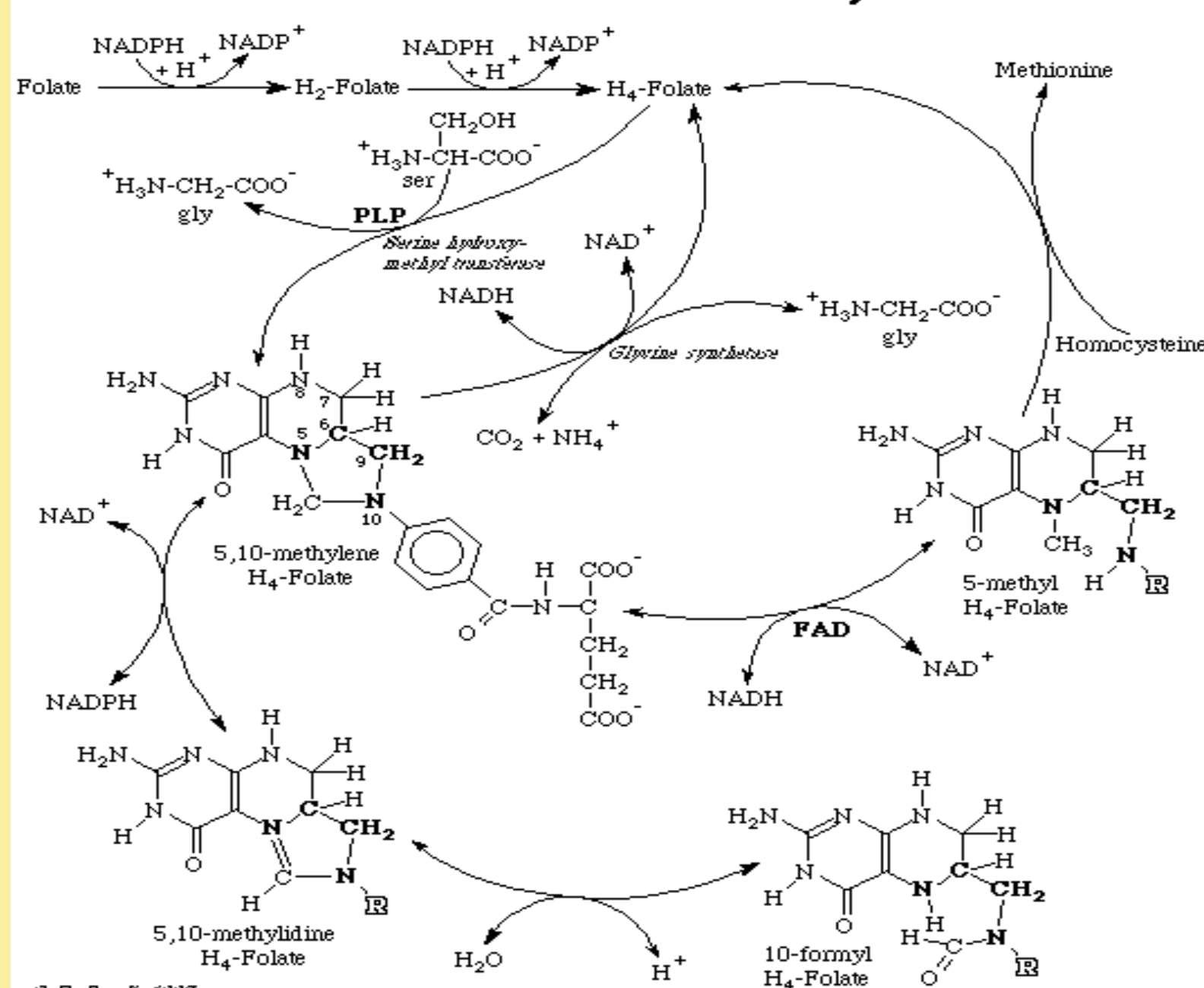
- Vit B2
 - essential cofactors in the conversion of 5-HTP→serotonin
- Niacin, Vit B3
 - essential cofactors in the conversion of 5-HTP→serotonin
- Vit B6: serotonin produce
- Vit B12
- Folate
- Pantothenic acid (vitamin B5)
 - relieving stress
 - food sources of the B vitamins: liver, whole grains, wheat germ, tuna, walnuts, peanuts, bananas, sunflower seeds, and blackstrap molasses



Vitamins B complex

- Sedative effect on the nerves
- Insomnia and B vitamins :
 - vitamins B6 and B12
 - wheat germ, bananas, sunflower seeds and tuna.
- **Vitamin B6** supplements
 - 1-2 T nutritional yeast, excellent source of vitamin B6.
 - stir it into a glass of juice.
- **Vitamin B12**, for treating insomnia.
 - vitamin B12 + **pantothenic acid (B5)**, effective anti-insomnia vitamin

Main Folate Metabolism Pathways





Foods to Eat

- **Chlorophyll-rich foods, such as leafy, green. vegetables, steamed or boiled.**
- **Microalgae, such as chlorella and spirulina.**
- **Oyster shell can be purchased in health food stores and taken as a nutritional supplement.**
- **Whole grains: Whole wheat, brown rice, and oats have a calming and soothing effect on the nervous system and the mind. Carbohydrates also boost serotonin, which promotes better sleep.**
- **Mushrooms (all types)**
- **Fruit, especially mulberries and lemons, which calm the mind.**
- **Seeds: jujube seeds are used to calm the spirit and support the heart. Chia seeds also have a sedative effect.**
- **Dill**
- **Basil**



Foods to Avoid-1

- Coffee
- Tea
- Spicy foods
- Cola
- Chocolate
- Stimulant drugs
- Alcohol
- Refined carbohydrates (They drain the B vitamins.)
- Additives
- Preservatives



Foods to Avoid-2

- Non-organic foods containing pesticides.
- Canned foods or any source of toxicity or heavy metals.
- Sugar and foods high in sugar and refined carbohydrates. These raise blood-sugar levels and can cause a burst of energy that disturbs sleep.
- Foods that are likely to cause gas, heartburn, or indigestion, such as fatty or spicy foods, garlic-flavored foods, beans, cucumbers, and peanuts.
- Foods such as meat that are high in protein can inhibit sleep by blocking the synthesis of serotonin, making us feel more alert.
- Monosodium glutamate (MSG), often found in Chinese food. This causes a stimulant reaction in some people.



Foods to Avoid-3

■ Avoid cigarettes and tobacco. While smoking may seem to have a calming effect, nicotine is actually a neurostimulant and can cause sleep problems.

■ Alcohol and caffeine are two beverages/food that you must avoid for a healthy sleep.

■ Avoid caffeine in all forms (tea, coffee, cola, chocolate). See Also: Caffeine Content of ■ Common Beverages for a table of caffeine in common beverages.



Foods That Can Interfere With Sleep

Coffee

Soft Drinks

Tea

Chocolate candy or dessert

Chocolate milk, hot chocolate, or
cocoa

Jalapeno peppers

Onions

Rich desserts

Rich sauces



Beverage	Caffeine (mg)	Soft drinks	
Coffee (7.5 oz. cup)		Jolt	100
Drip	115-150	Mountain Dew	54
Brewed	80-135	Tab	47
Instant	65-140	Coca-Cola	45
Decaffeinated	3-4	Diet Coke	45
Tea (5 oz. cup)		Dr Pepper	40
1-min. brew	20	Pepsi	38
3-min. brew	35	Diet Pepsi	36
Iced (12 oz.)	70	7Up	0

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- Alcohol - sleep-impairing effects.
 - release of adrenaline,
 - impairs transport of tryptophan into the brain,
 - alcohol disrupts serotonin levels.
- Foods high in complex carbohydrates:
 - a mild sleep-enhancing effect: ↑ serotonin
 - bread, bagels, and crackers



- Lettuce has a long-standing reputation for promoting healthy sleep.
 - opium-related substance combined with traces of the anticramping agent hyoscyarnin
 - lemon juice + lettuce juice - an effective sleep-inducing drink
- Warm milk with honey
 - the oldest and best remedies for insomnia
 - milk contains tryptophan → serotonin
 - induces sleep and prevents waking.



- Meal should include legumes, peanuts, nutritional yeast, fish or poultry.
 - foods contain vitamin B3 (niacin).
 - niacin is involved in serotonin synthesis and promotes healthy sleep.



Recommendations

- High-carbohydrate snack and avoid high-protein foods in the 1-2 hour before bed time.
- High in tryptophan → ↑ serotin
 - turkey, bananas, figs, dates, yogurt, milk, tuna, and whole grain crackers or nut butter.
- High in tyramine → release of norepinephrine, a brain stimulant.
 - ↑ digestive system slows at night.
 - harder to digest late meals.
 - bacon, cheese, chocolate, eggplant, ham, potatoes, sauerkraut, sugar, sausage, spinach, tomatoes, and wine close to bedtime.



**Thank you for your
attention !**



Phenalanine

- Used by the brain to produce Norepinephrine, a chemical that transmits signals between **nerve cells** and the **brain**;
- Keeps **awake & alert**;
- Reduces hunger pains;
- Functions as an antidepressant and helps improve memory.



Table 1. FAO/WHO/UNU (1985) estimates of amino acid requirements in pre-school and school-aged children and in adults^a

Amino acid	Pre-school children (2-5 yr)		Schoolchildren ^b (10-12 yr)		Adults (18+ yr)	
	mg/kg/day	mg/g protein	mg/kg/day	mg/g protein	mg/kg/day	mg/g protein
Histidine	?		?		8-10	16
Isoleucine	31	28	28	28	10	13
Leucine	73	66	44	44	14	19
Lysine	64	58	44	44	12	16
Methionine and cysti ^c	27	25	22	22	13	17
Phenylalanine and tyrosine	69	63	22	22	14	19
Threonine	37	34	28	28	7	9
Tryptophan	12.5	11	3.3	9	3.5	5
Valine	38	35	25	25	10	13
Total (except for histidine)	352	350	216	222	84	113

a. From tables 4 and 39 in FAO/WHO/UNU .

b. Also based on a summary by Williams et al. .

c. Sulfur amino acids.



		ile	leu	lys	met and cysti	phe & tyr	thr	trp	val
milk	100g	1322	2579	2131	668+1575=2243	1252+1294=2546	1122	273	1575
Veg	100g	—	—	—	—	—	—	—	—
Fruit	100g	—	—	—	—	—	—	—	—
Cereal	100g	257	578	342	174+391=565	434+321=755	316	0	546
Soy	100g	950	1632	1228	233+379=612	1101+803=1904	764	286	964
Gluten	100g	698	1396	338	121+808=929	982+646=1628	496	0	728
Oil	100g	—	—	—	—	—	—	—	—
Peanut	100g	985	1954	949	303+690=993	1526+1236=3762	780	0	1191



		ile	leu	lys	met and cysti	phe & tyr	thr	trp	val
30Kg BW		300	420	360	390	420	210	105	300
1 杯	milk	3172.8	6189.6	5114.4	5383.2	6110.4	2692.8	655.2	3780
3碟	Veg	—	—	—	—	—	—	—	—
2個	Fruit	—	—	—	—	—	—	—	—
3碗	Cereal	616.8	1387.2	820.8	1356	1812	758.4	0	1310.4
3份120g	Soy	1140	1958.4	1473.6	734.4	2284.8	916.8	343.2	1156.8
1份30g	Gluten	209.4	418.8	101.4	278.7	488.4	148.8	0	218.4
3T45g	Oil	—	—	—	—	—	—	—	—
1份10g	Peanut	98.5	195.4	94.9	99.3	376.2	78	0	119.1
	Subtotal	5237.5	10149.4	7605.1	7851.6	11071.8	4594.8	998.4	6584.7



Avoid Nocturnal Hypoglycemia

- Blood glucose level ↓ → regulate glucose levels
hormones release
 - stimulate the brain
 - a natural signal “time to eat”
- **Chromium (Cr)**
 - normal insulin secretion
 - effect blood sugar problem → awake at nights.
 - good source: brewer's yeast, whole grain, beef, beer



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