Love Your Gut!
Joseph B. Weiss, MD, FACP, FACG, AGAF
Clinical Professor of Medicine
University of California, San Diego

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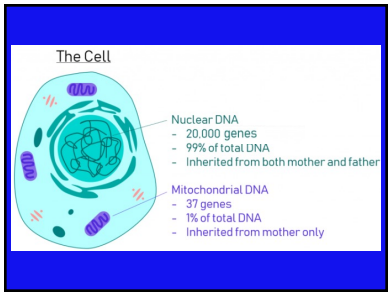
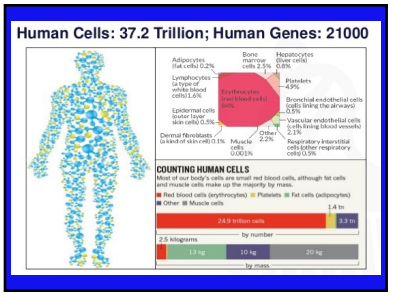

The Cell
Nuclear DNA
- 20,000 genes
- 99% of total DNA
- Inherited from both mother and father
Mitochondrial DNA
- 37 genes
- 1% of total DNA
- Inherited from mother only

2


Human Cells: 37.2 Trillion; Human Genes: 21000
COUNTING HUMAN CELLS

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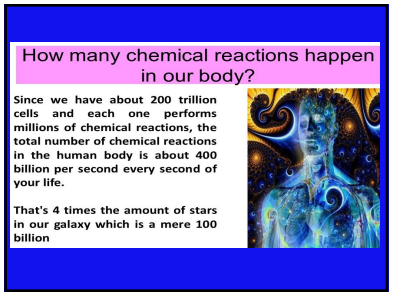
How many chemical reactions happen in our body?
Since we have about 200 trillion cells and each one performs millions of chemical reactions, the total number of chemical reactions in the human body is about 400 billion per second every second of your life.
That's 4 times the amount of stars in our galaxy which is a mere 100 billion

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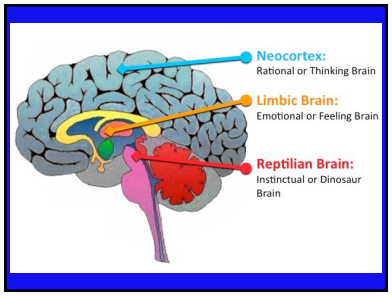
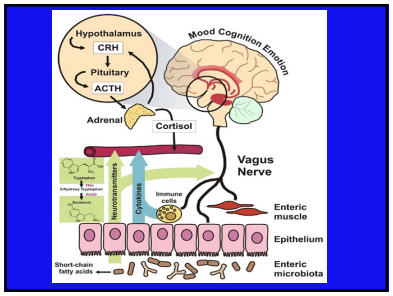

Neocortex:
Rational or Thinking Brain
Limbic Brain:
Emotional or Feeling Brain
Reptilian Brain:
Instinctual or Dinosaur Brain

5

GUT-BRAIN
CONNECTION

6


Hypothalamus
CRH
Pituitary
ACTH
Adrenal
Cortisol
Mood Cognition Emotion
Vagus Nerve
Cytokines
Immune cells
Enteric muscle
Epithelium
Enteric microbiota
Short-chain fatty acids

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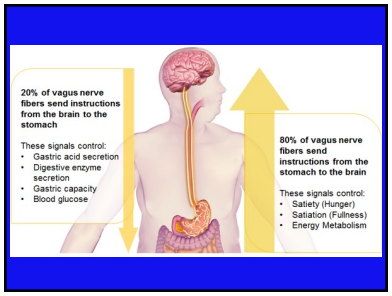
20% of vagus nerve fibers send instructions from the brain to the stomach
These signals control:
• Gastric acid secretion
• Digestive enzyme secretion
• Gastric capacity
• Blood glucose
80% of vagus nerve fibers send instructions from the stomach to the brain
These signals control:
• Satiety (Hunger)
• Satiation (Fullness)
• Energy Metabolism

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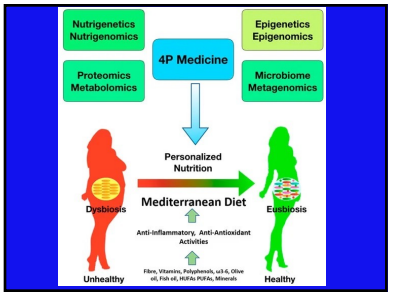
Nutrigenetics Nutrigenomics
Epigenetics Epigenomics
Proteomics Metabolomics
4P Medicine
Microbiome Metagenomics
Personalized Nutrition
Mediterranean Diet
Dysbiosis
Eubiosis
Unhealthy
Healthy

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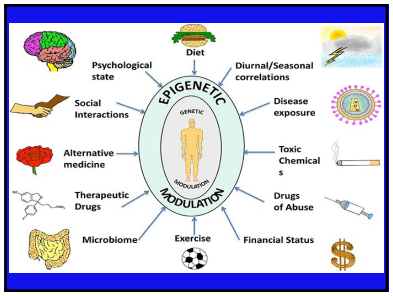

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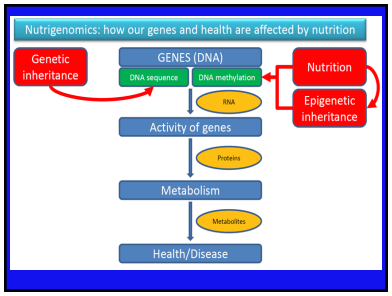

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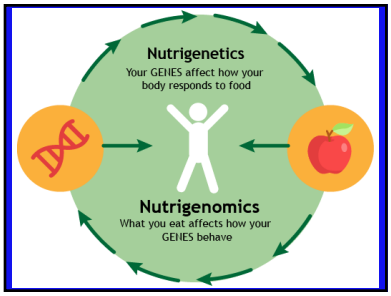

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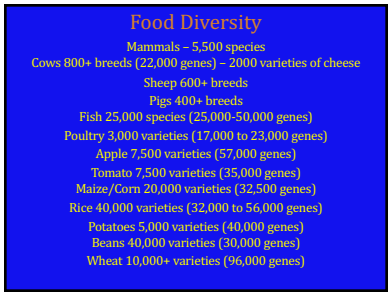

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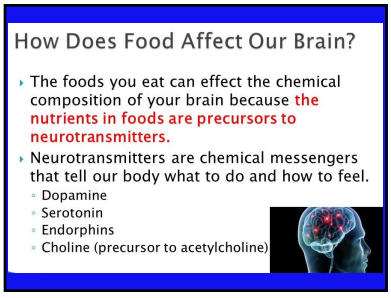

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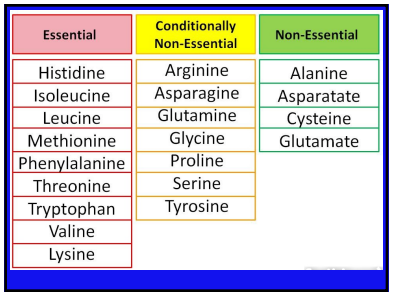

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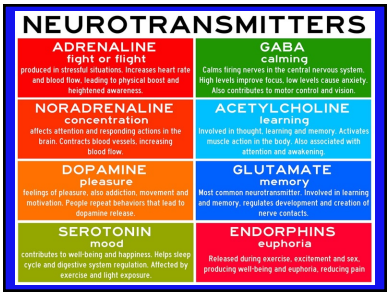

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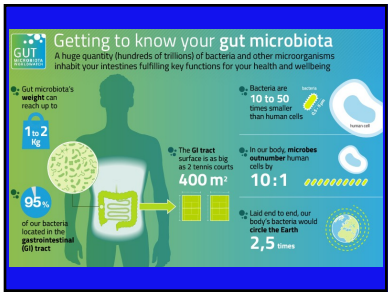

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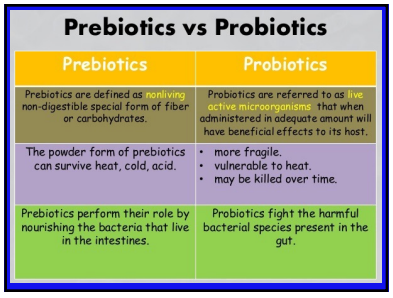

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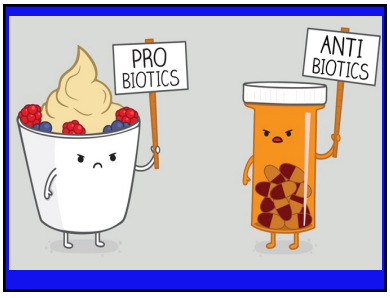

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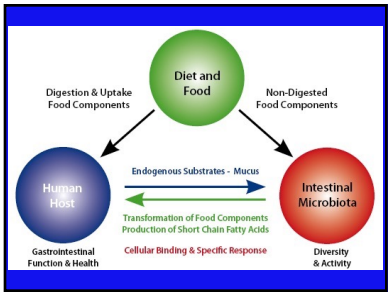

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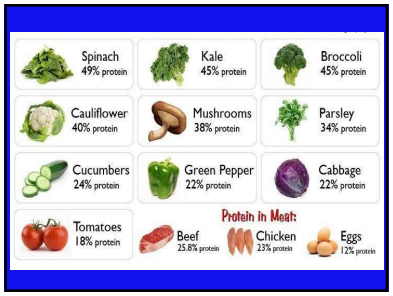

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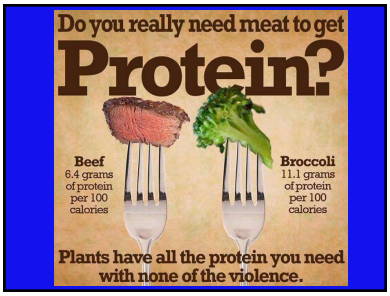

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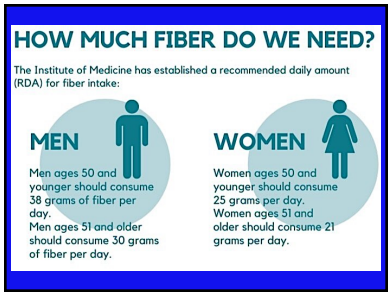

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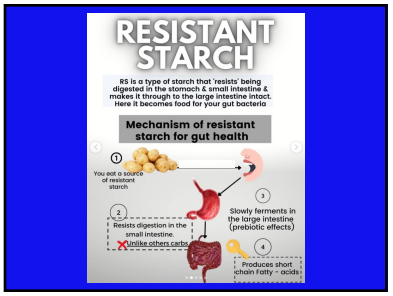

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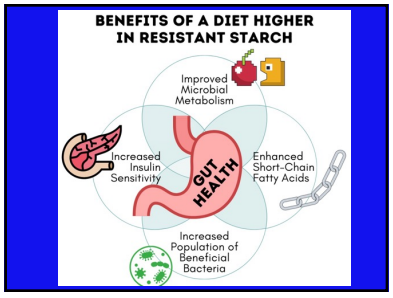

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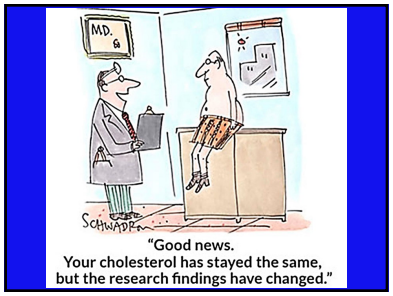

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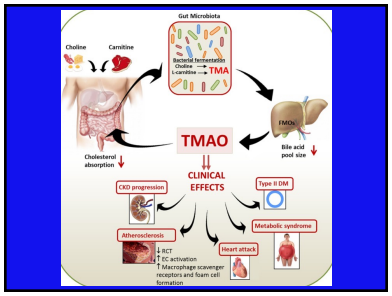

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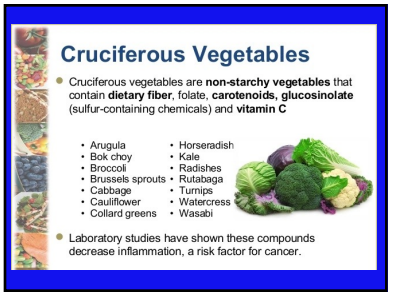

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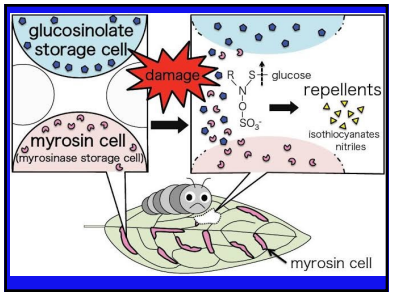

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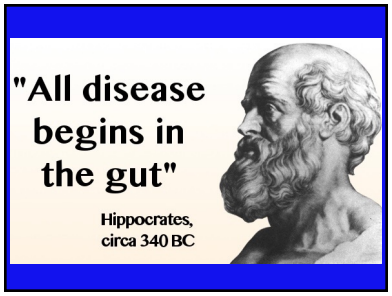

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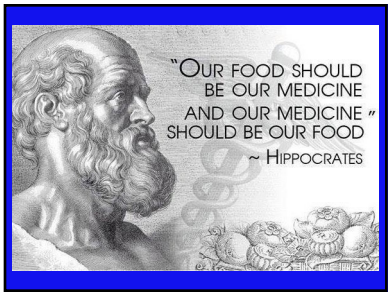

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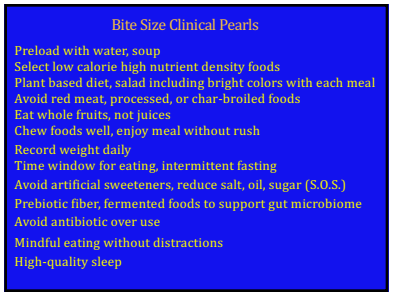

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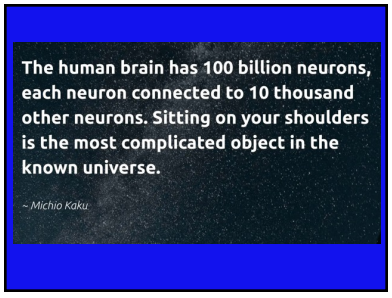

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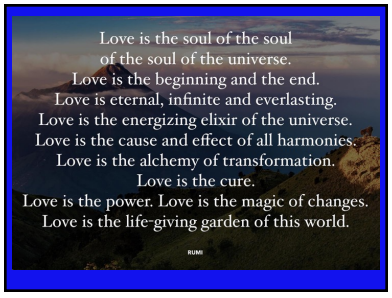

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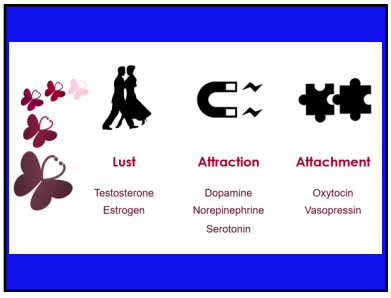

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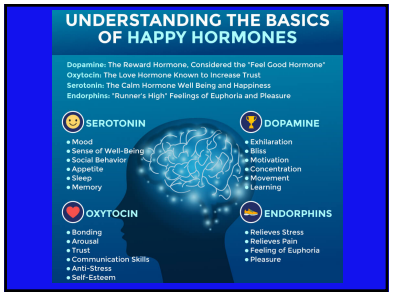

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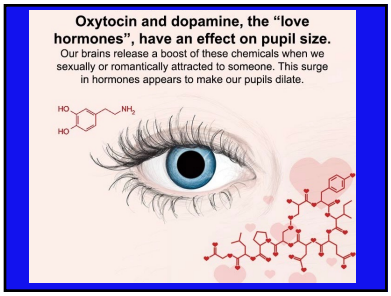

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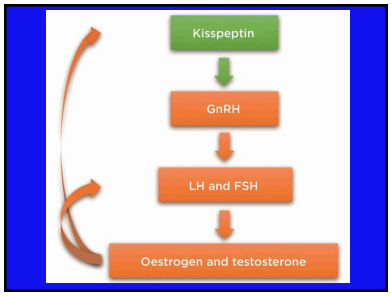

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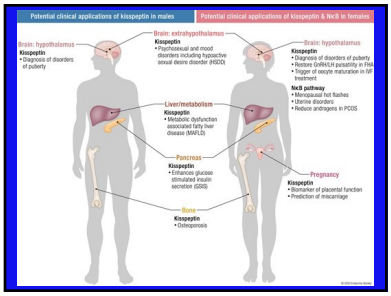

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Stage 1:Lust/Romantic Feelings

Lust is driven by SEX hormones; Testosterone and Estrogen. During this stage of love, your partner seems "perfect" or ideal for you, because of endorphins soak your brain.

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Testosterone:

Testosterone is a steroid hormone that starts the development of male and some female sexual characteristics/drive. Testosterone is produced in the testes, ovaries, and adrenal cortex.

56

Estrogen:

Estrogen is a steroid hormone that promotes the development and maintenance of female physical and sexual characteristics. Estrogen is an important factor for menstrual and estrous reproductive cycles. Estrogen is produced in the ovaries, adrenal cortex, placenta, and testes.

57

Stage 2: Physical Attraction:

Physical attraction is also known as the "love-sick" phase, and is controlled by three neurotransmitters; adrenaline, dopamine, and serotonin. During this stage you daydream about your partner all day, and they are the center of your attention, causing you to lose appetite, and need less sleep.

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Adrenaline/Epinephrine:

Adrenaline activates stress responses, also increases blood and cortisol levels. Adrenaline creates a charming effect when you meet your partner, you start to sweat, your heart races, and your mouth goes dry. Once adrenaline is secreted by adrenal glands it prepares muscles for exertion, and your blood pressure sky rockets; creating a strong physical attraction to one another.

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Dopamine:

Dopamine stimulates "desire and reward" by triggering intense rushes of pleasure; the same effect as snorting cocaine. Dopamine plays a huge role in cognition, mood, sleep and attention. Dopamine or the pleasure chemical is why you think about your partner all day, and lose sleep. Studies show that dopamine is a main cause of schizophrenia and Parkinson's disease.

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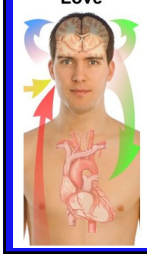
Chemical basis of **Love**



Throughout history, mankind has deemed the heart the center of love.

But scientists tell us love is all in our mind or brain and fueled by chemicals and chemistry.

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Chemical basis of **Love**

Attachment:
- Oxytocin
- Vasopressin

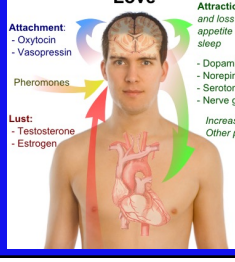
Pheromones

Lust:
- Testosterone
- Estrogen

Attraction:
and loss of appetite and sleep

- Dopamine
- Norepinephrine
- Serotonin
- Nerve growth factor

Increased heart rate
Other physical effects



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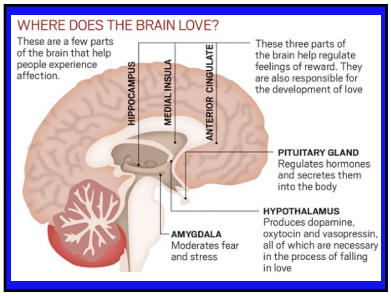

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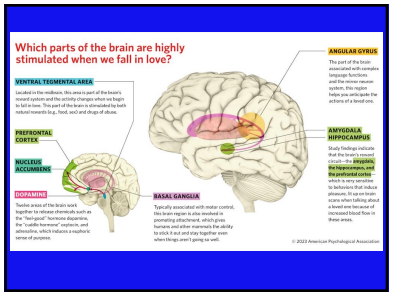

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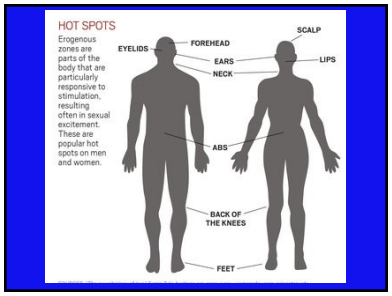

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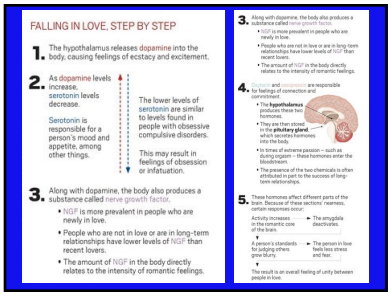

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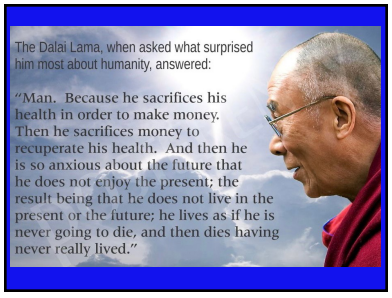

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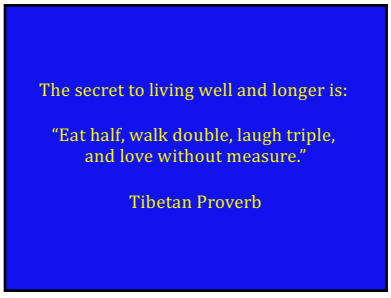

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