

# vitamin D



The body itself makes vitamin D when it is exposed to the sun

Cheese, butter, margarine, fortified milk, fish, and fortified cereals are food sources of vitamin D





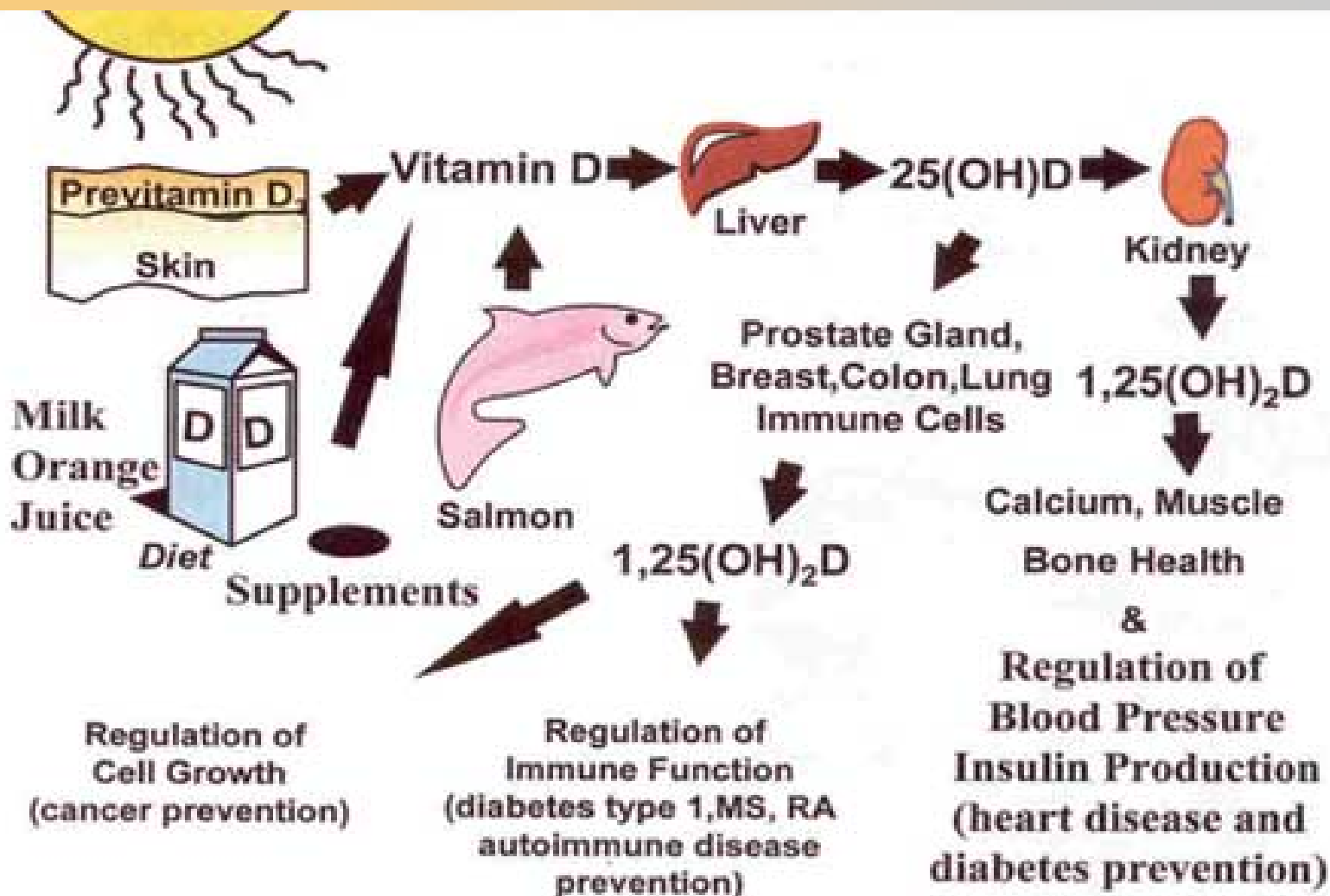
# *Today's Quiz*



- If you relied on the sun for vitamin D, how long does an adult need sun exposure each day in Missoula, to get enough?
- What are 5 food sources of vitamin D?
- What are health risks to having inadequate blood levels of vitamin D?
- How much vitamin D does an adult need daily?
- How do you know if you are getting enough vitamin D?

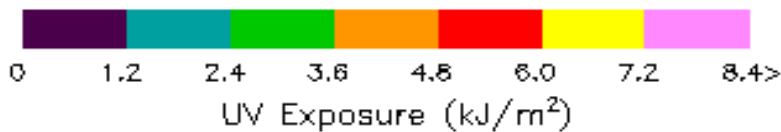
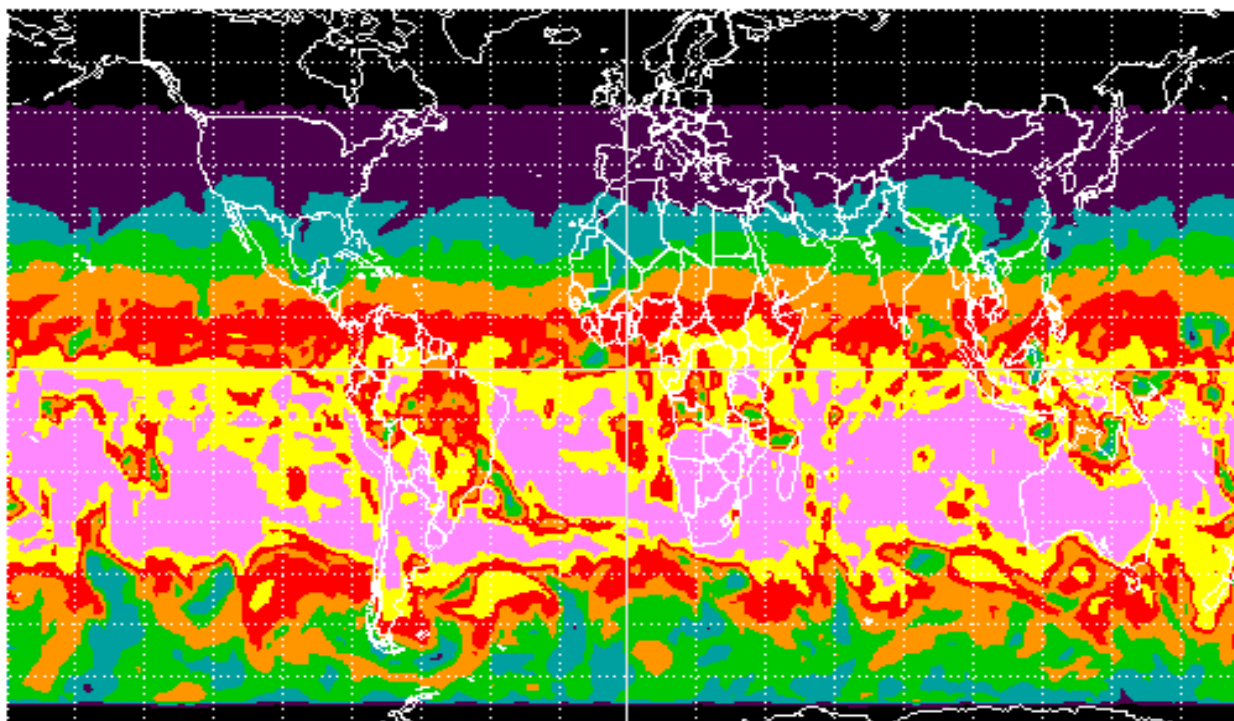


# *Not Just Your Usual Fat Soluble Vitamin*





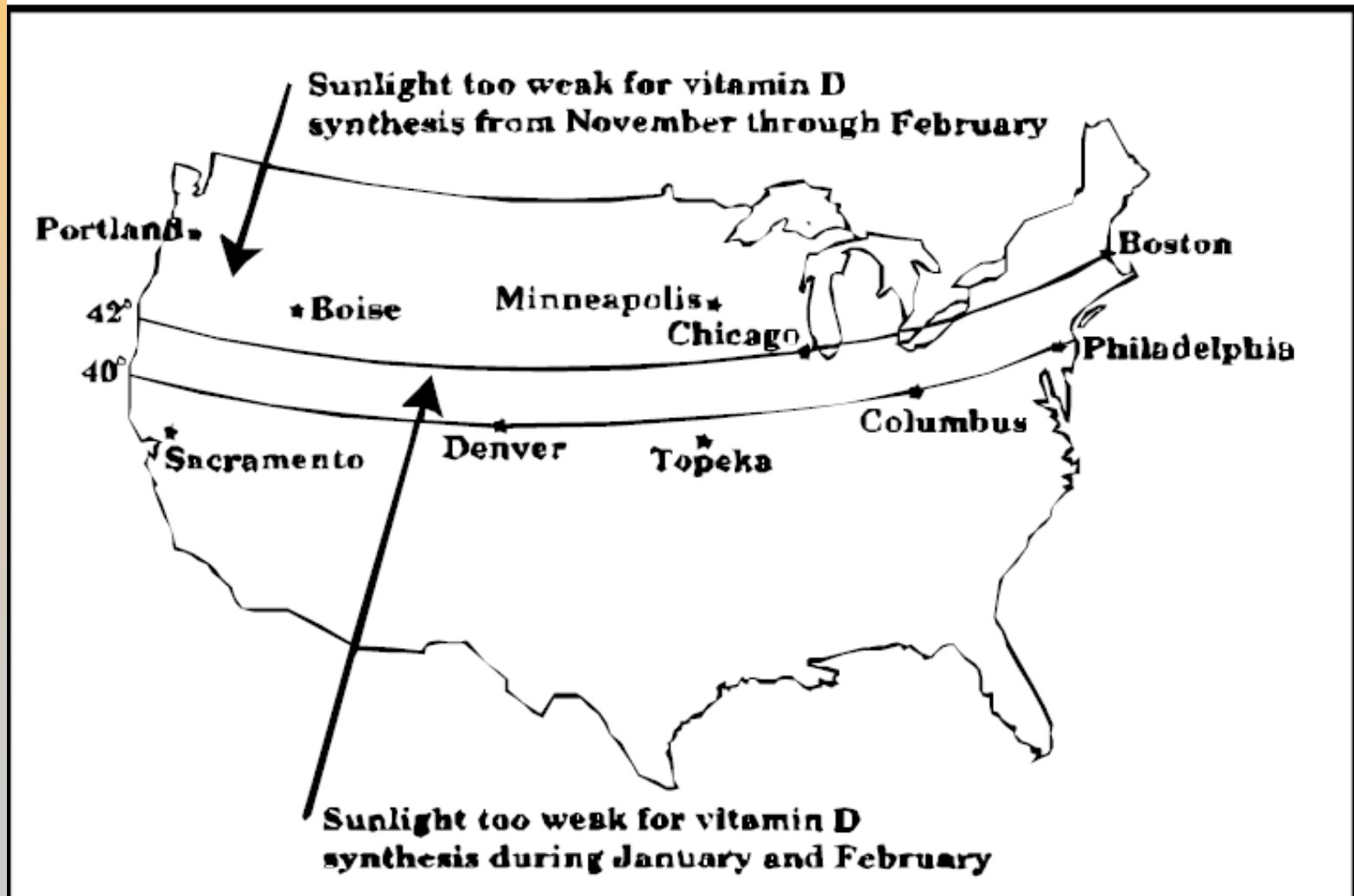
# *Earth Probe TOMS UV Erythemal Exposure January 15, 2003*



Goddard Space  
Flight Center



*UVB light is influenced by time of day, date, latitude, altitude, & cloud cover*





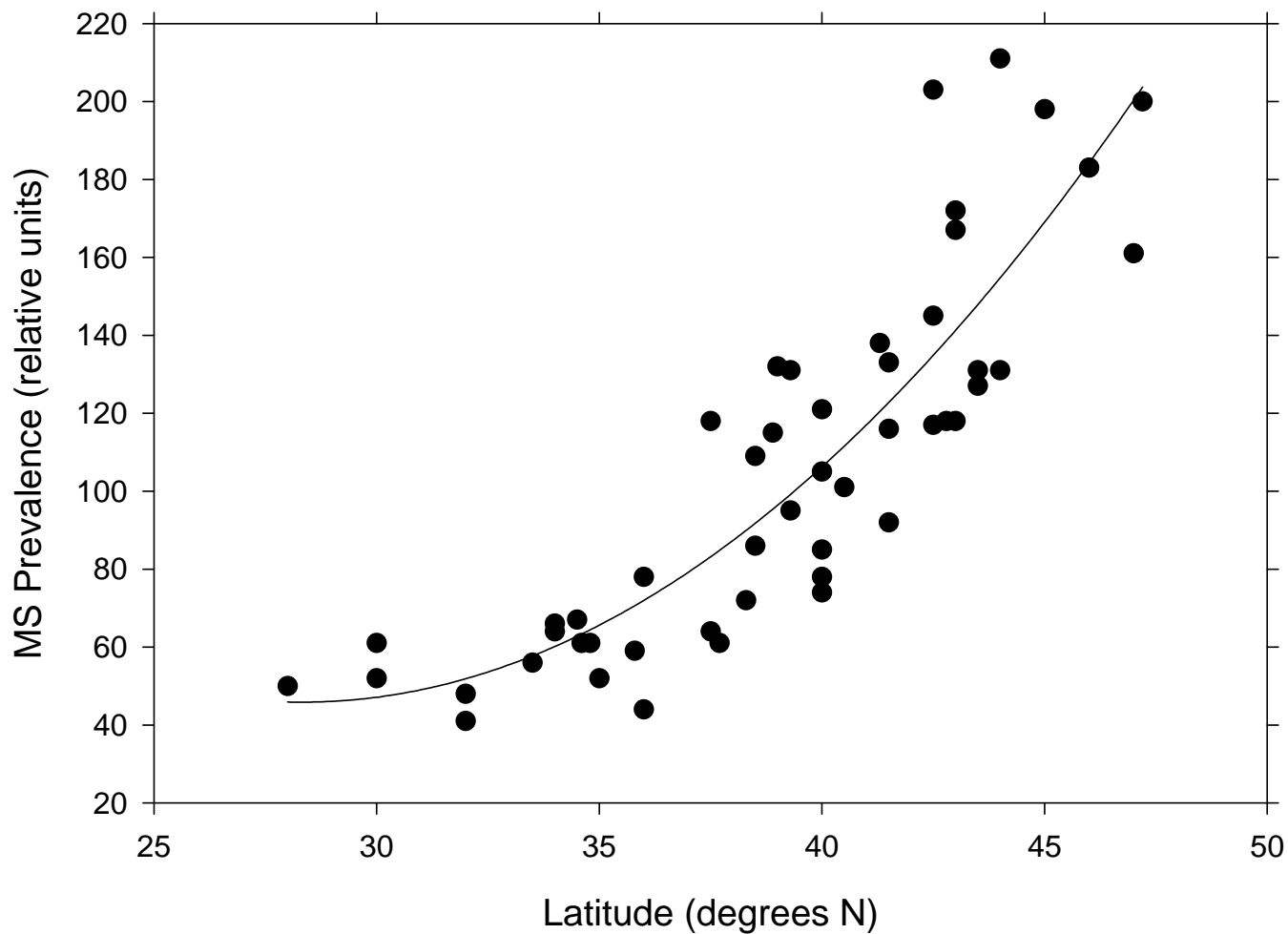
## *UVB Blocked by*

- Clothing
- Sun Screen
- Glass
- Dark pigmentation of skin
- Cloud cover
- Ozone





## Multiple Sclerosis Prevalence for U.S. WWII, KC Veterans at Time of Entry into the Armed Forces vs. Latitude





# *Food Sources of Vitamin D*



<b>FOOD, STANDARD AMOUNT</b>	<b>VITAMIN D (IU)</b>	<b>CALORIES</b>
Cod Liver Oil, 1 Tbsp	1360	123
Salmon, cooked, 3½ oz	360	201
Mackerel, cooked, 3½ oz	345	256
Tuna fish, canned in oil, 3 oz	200	198
Sardines, canned in oil, 1¾ oz	250	103
Milk, nonfat, reduced fat, and whole, fortified, 1 cup	98	86-138
Margarine, fortified, 1 Tbsp	60	102
Pudding, made w/ vitamin D fortified milk, ½ cup	50	197
Egg, 1 whole (vitamin D found in egg yolk)	20	72
Liver, beef, cooked, 3½ oz	15	220
Cheese, Swiss, 1 oz	12	95
Fortified orange juice 1 cup	100	122



# *Vitamin D Needs Based on*

- Skin pigmentation
- Age and body size
- Latitude, altitude, time of year, time of day
- BMI (higher BMI, higher daily need)
- Alcohol consumption
- Anti-seizure medications
- Steroid use
- Use of sun-screen
- Skin exposure to sun





# *History of our Understanding of Vitamin D*



- Industrialization brought people out of the sun and into the factories and rickets then identified.
- 1930s discover something in cod liver oil prevented rickets, and this was “vitamin D”.
- Irradiated skin and fed it to rats with rickets, they got better.
- Once chemical was isolated, scientists experimented with high doses on children. Any ideas why the children died in this experiment?
- Williams syndrome “confirmed” suspicions.



# *Vitamin D Deficiency Causes or Contributes To*

- Rickets, osteomalacia and osteoporosis
- 14 kinds of cancer
- Long latency auto-immune diseases including RA, SLE, Type I Diabetes, TB and MS.
- Atherosclerosis secondary to elevated c-reactive protein
- Psoriasis
- Periodontal disease
- Depression
- Secondary hyperparathyroidism
- High blood pressure and stroke
- Muscle weakness, pain and fatigue





# *Normal Ranges for Lab Values*

## **25-hydroxyvitamin D (25(OH)D)**

8	80	ng/mL US standard
20	150	nmol/L International standard





## *Dose Recommendations, if low or at Risk Due to Medications or ETOH*

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- 50,000 IU bolus
- 4000 IU per day for 90 days, retest
- Breastfeeding moms need 5000 IU per day will provide 400 IU in breastmilk
- Infants need supplementation of at least 400 IU per day
- If on anti-seizure meds, steroids, alcohol abuse 50,000 IU per week.





*And remember Vitamin D also  
helps with Fall Prevention*

