

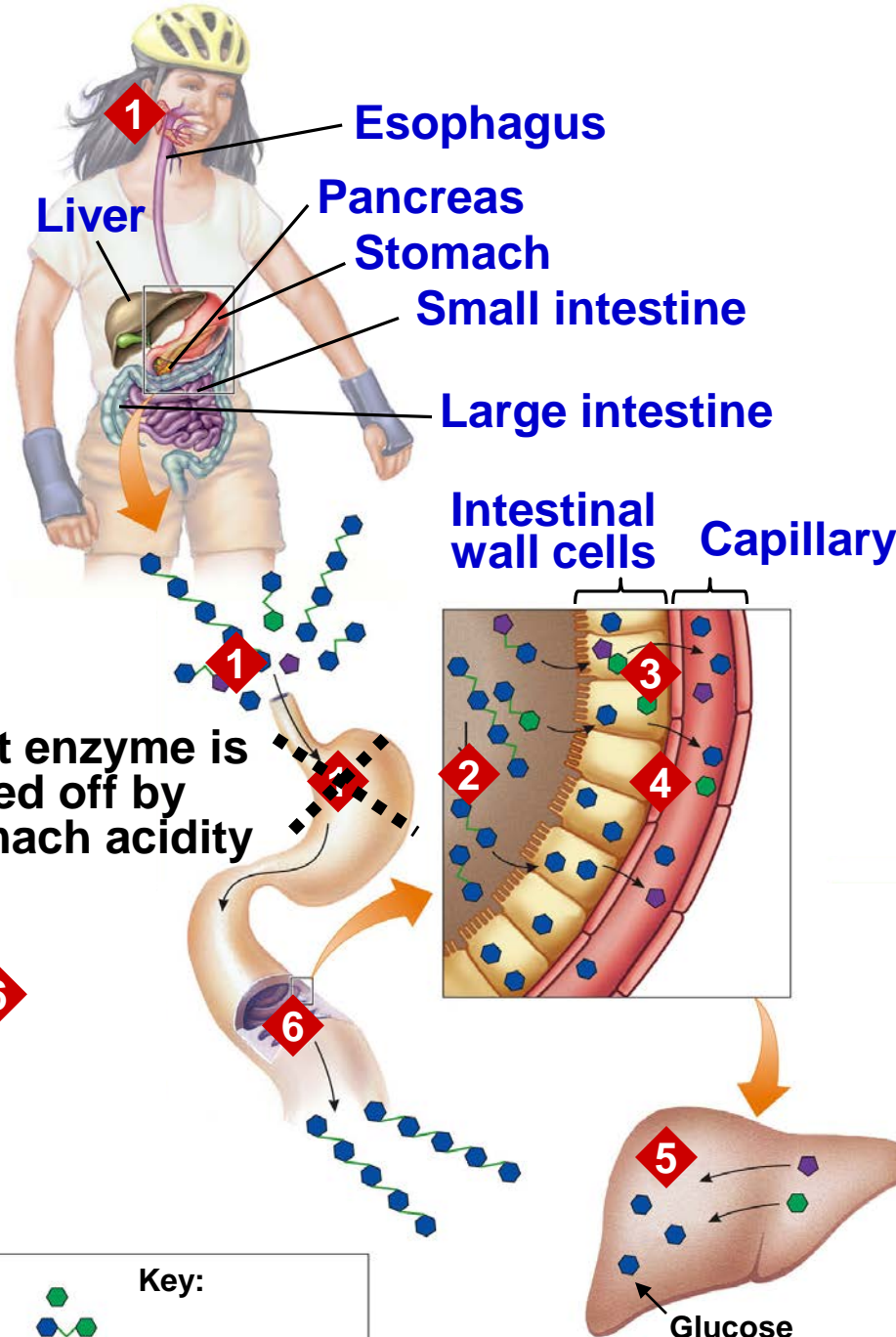
Go, Slow, and Whoa!
**A Quick Guide to
Healthy Eating**



BI 199 Discussion 6

- I. Announcements** Outline comment status?
Nutrition reports w/answers to questions submitted by e-mail by Wednesday. lombardi@uoregon.edu
Please use requested format. Q?
- II. National Heart, Lung & Blood Institute** Go, Slow, Whoa!
Identifying Go, Slow, Whoa Foods! Partner contest!
<http://www.nhlbi.nih.gov/health/public/heart/obesity/wecan/eat-right/choosing-foods.htm>
- III. Carbohydrate Digestion & Glucose Regulation** ch 4 pp131-7
- IV. Glycemic Index & Diabetes Mellitus** pp 137-50
- V. Are Added Sugars Bad for You?** pp 151-5
- VI. Quiz Bowl** Ch 4 Group Competition
- VII. The Lipids: Fats, Oils, Phospholipids & Sterols** Lipoid?
S&W ch 5 pp 156-64 Importance of Fats + a Close Look!

Carbohydrate Digestion



1 Carbohydrate digestion begins in the mouth

...but enzyme is turned off by stomach acidity

6 Fibers travel unchanged to large intestine

Key:

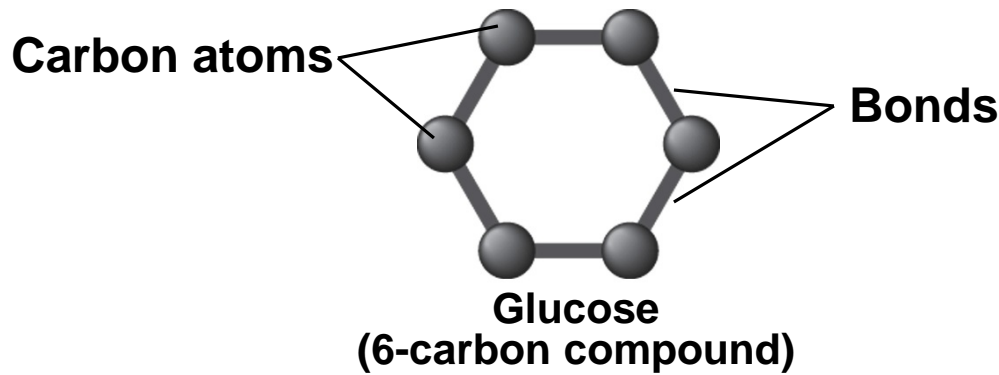
- Galactose (green hexagon)
- Lactose (blue-green hexagons)
- Sucrose (purple hexagon)
- Maltose (blue hexagons)
- fiber starch (blue chain of hexagons)

2 ...enzyme from pancreas resumes enzymatic digestion

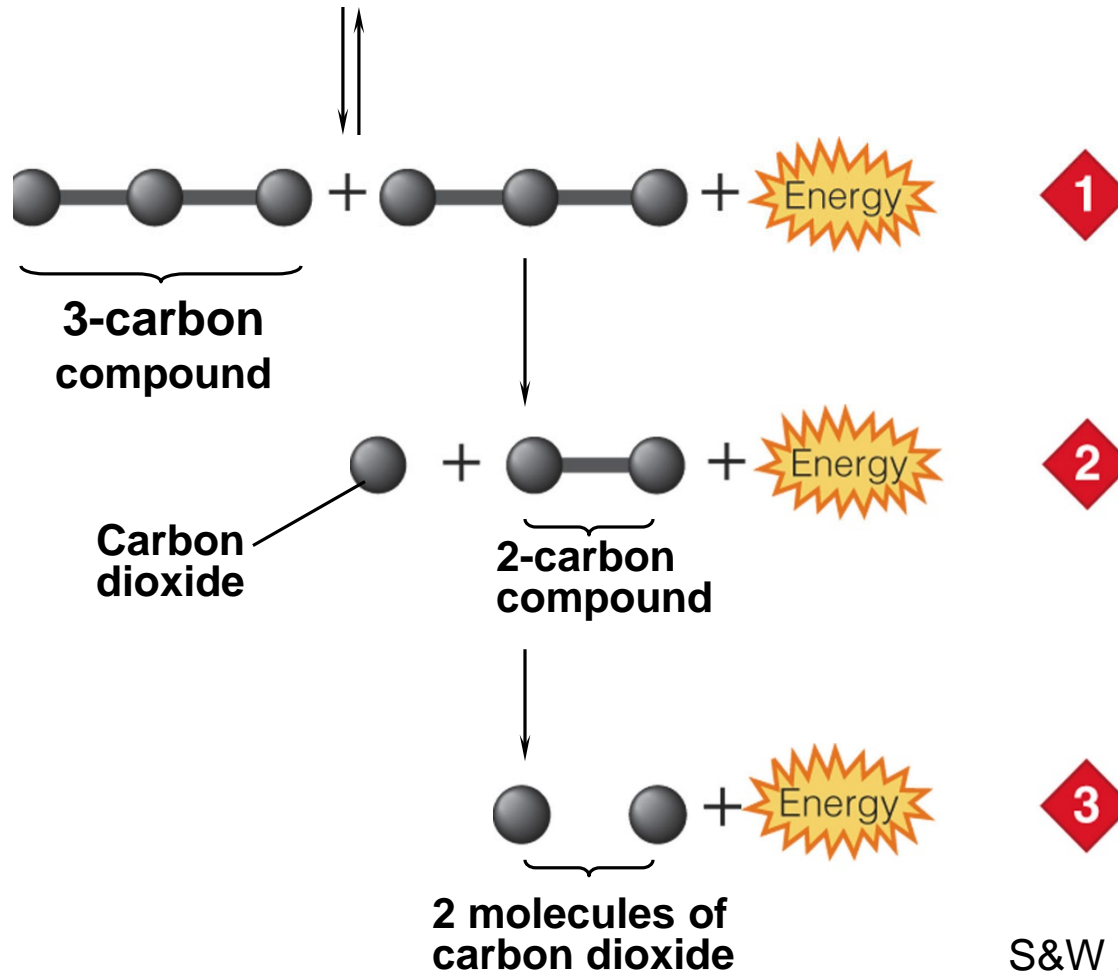
3 Small intestine enzymes split dimers into monomers

4 Monomers enter capillaries & are delivered to liver

5 Liver converts galactose & fructose to glucose



**Glucose breakdown
yields energy + CO₂**



If you're gonna eat the food, you'd better play the game!



Glycemic Index?

HIGH

100

Glucose

Rice milk

Baked potato, boiled potato

Sports drinks, jelly beans

Pumpkin, popcorn, bagel

Raisins, brown rice

Honey

Ice cream

Corn, pound cake

Rye bread, orange juice

Grapes, corn tortillas

Bran cereals, black-eyed

peas, peaches, oranges

Tomato juice, navy

beans, apples, pears

Soy milk

Chickpeas (garbanzo beans)

Barley

Peanuts

87

Mashed potato, instant; rice crackers

Cornflakes

Oatmeal, instant

Watermelon, doughnut

75

White bread, wheat bread, white rice

62

Couscous, sucrose (table sugar)

Cola, pineapple

Oatmeal, cooked

Bananas, mangoes

50

Green peas, baked beans, pasta

Chocolate pudding, chocolate candy

37

Apple juice, dates, carrots

Yogurt, milk

Butter beans, lentils

Kidney beans

25

Cashews, cherries

Soybeans

12

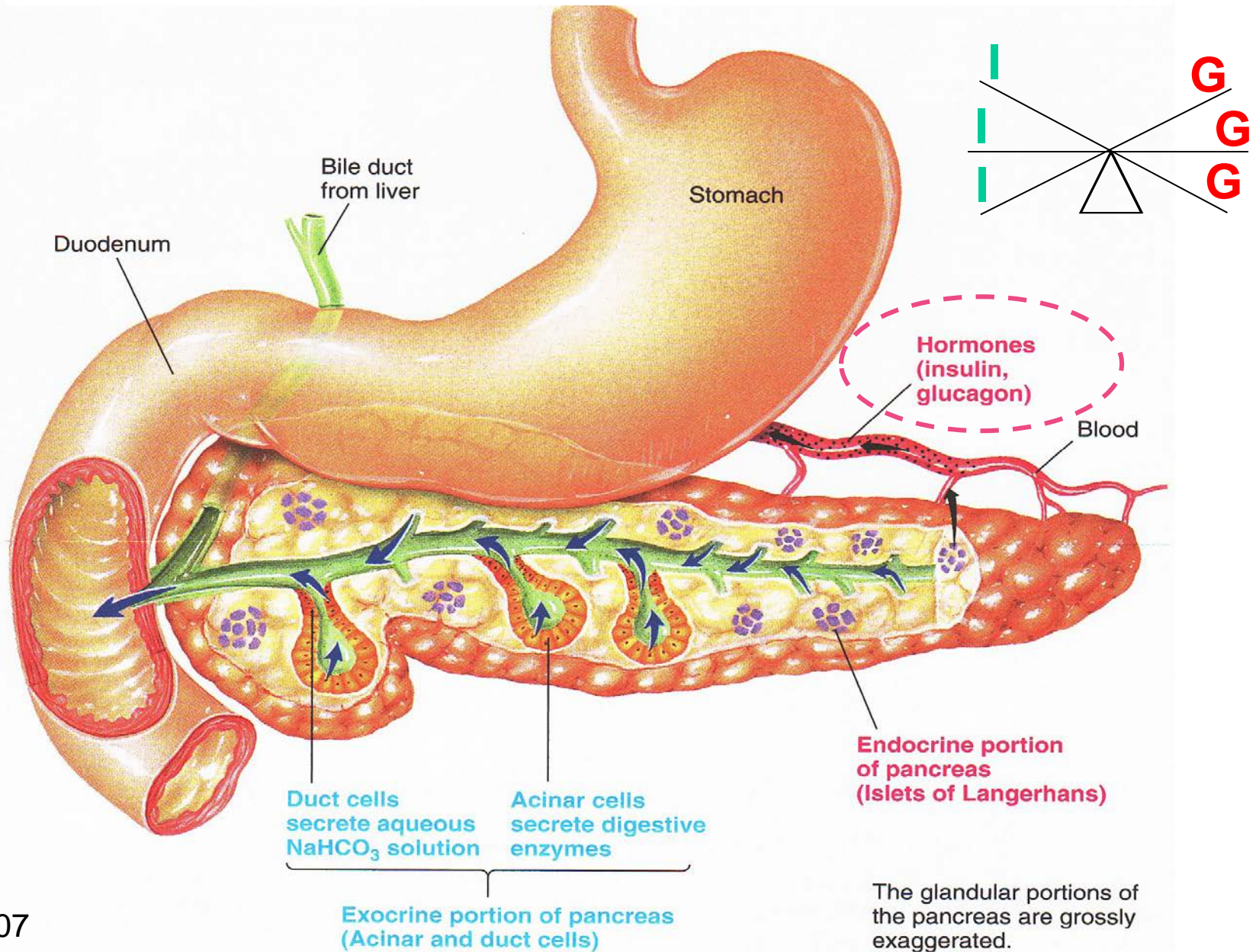
Fructose

LOW

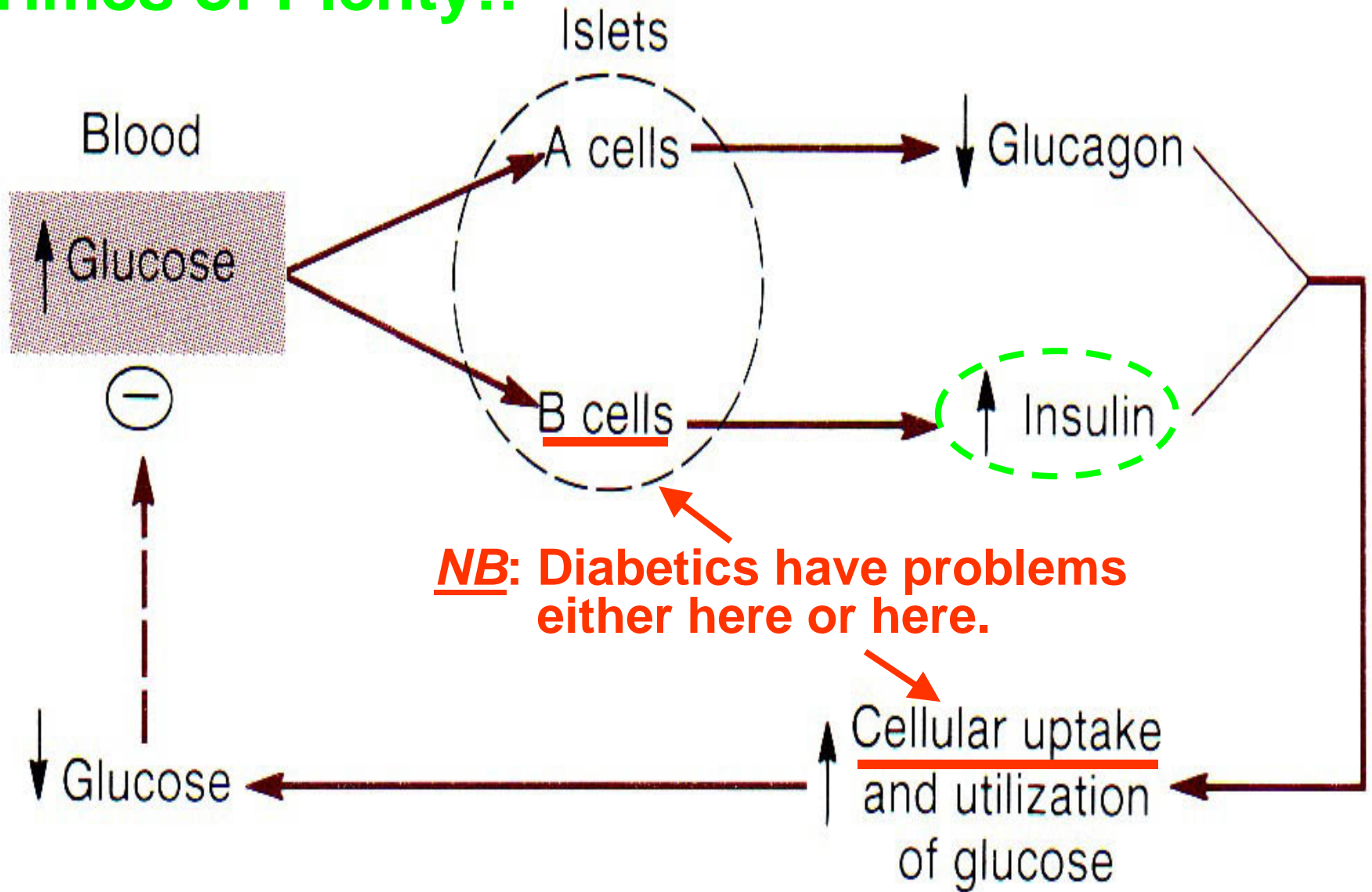
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Endocrine Pancreas: Insulin (I) & Glucagon (G)

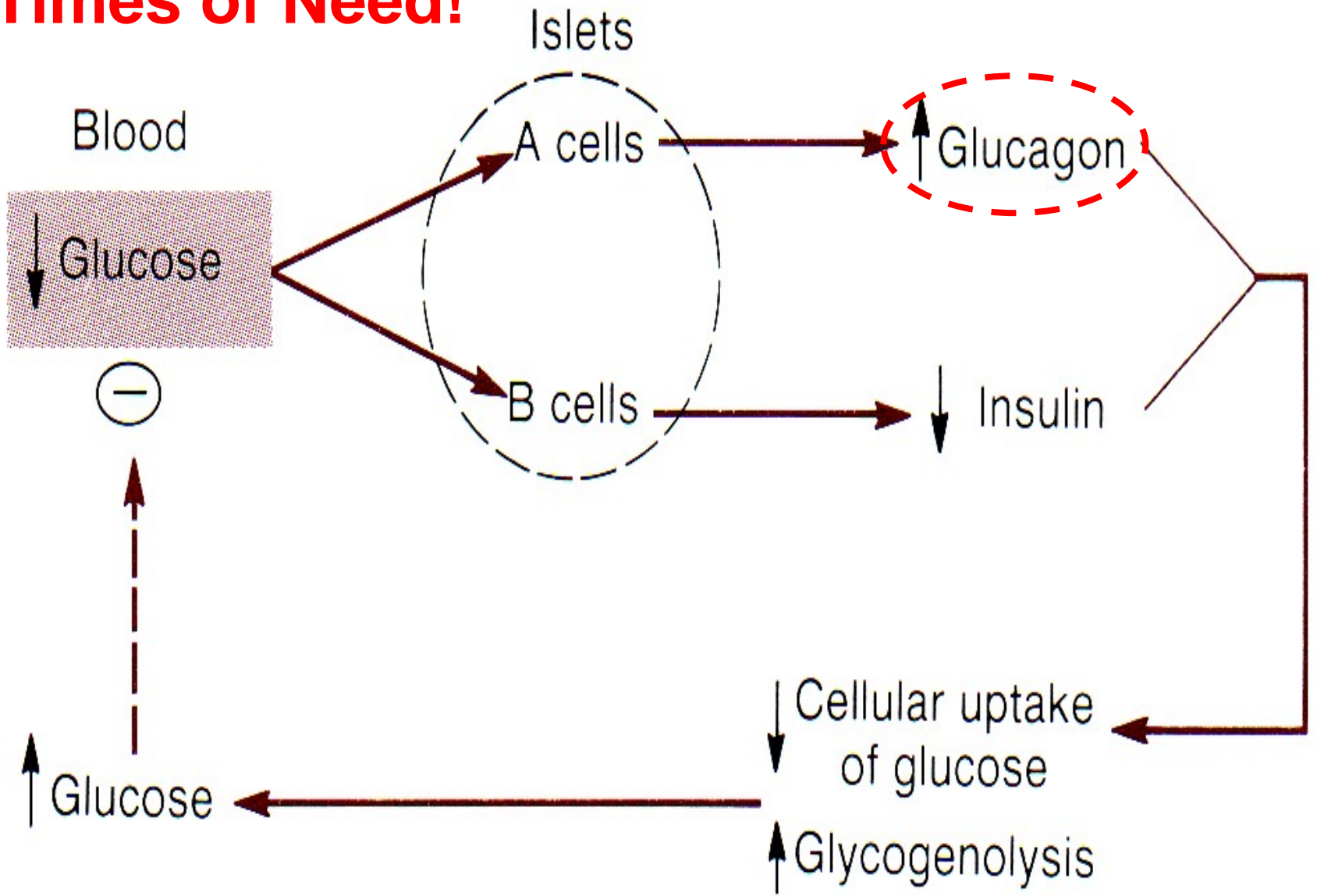
See-Saw Hormones in Regulating Blood Glucose

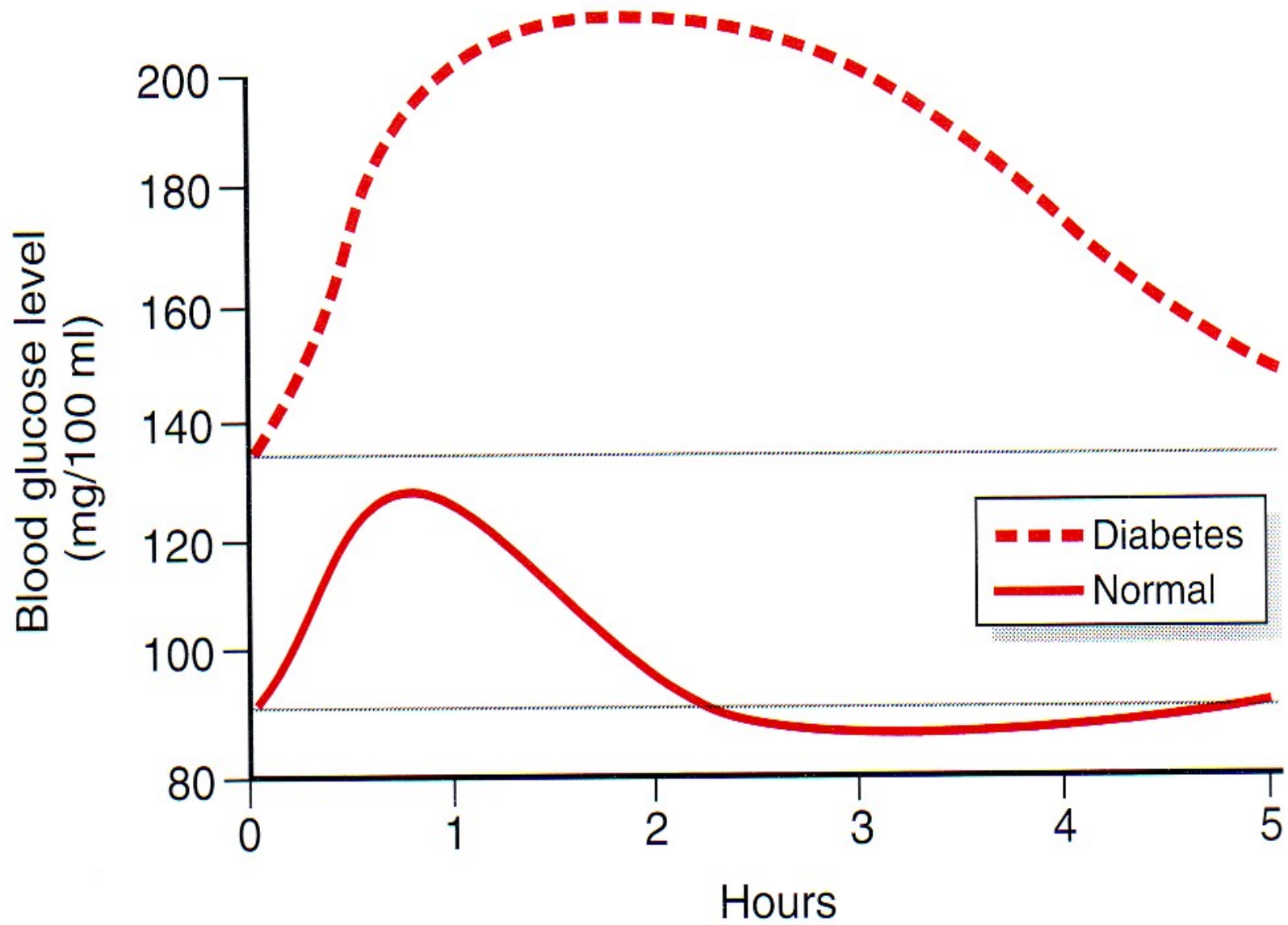


Times of Plenty!!

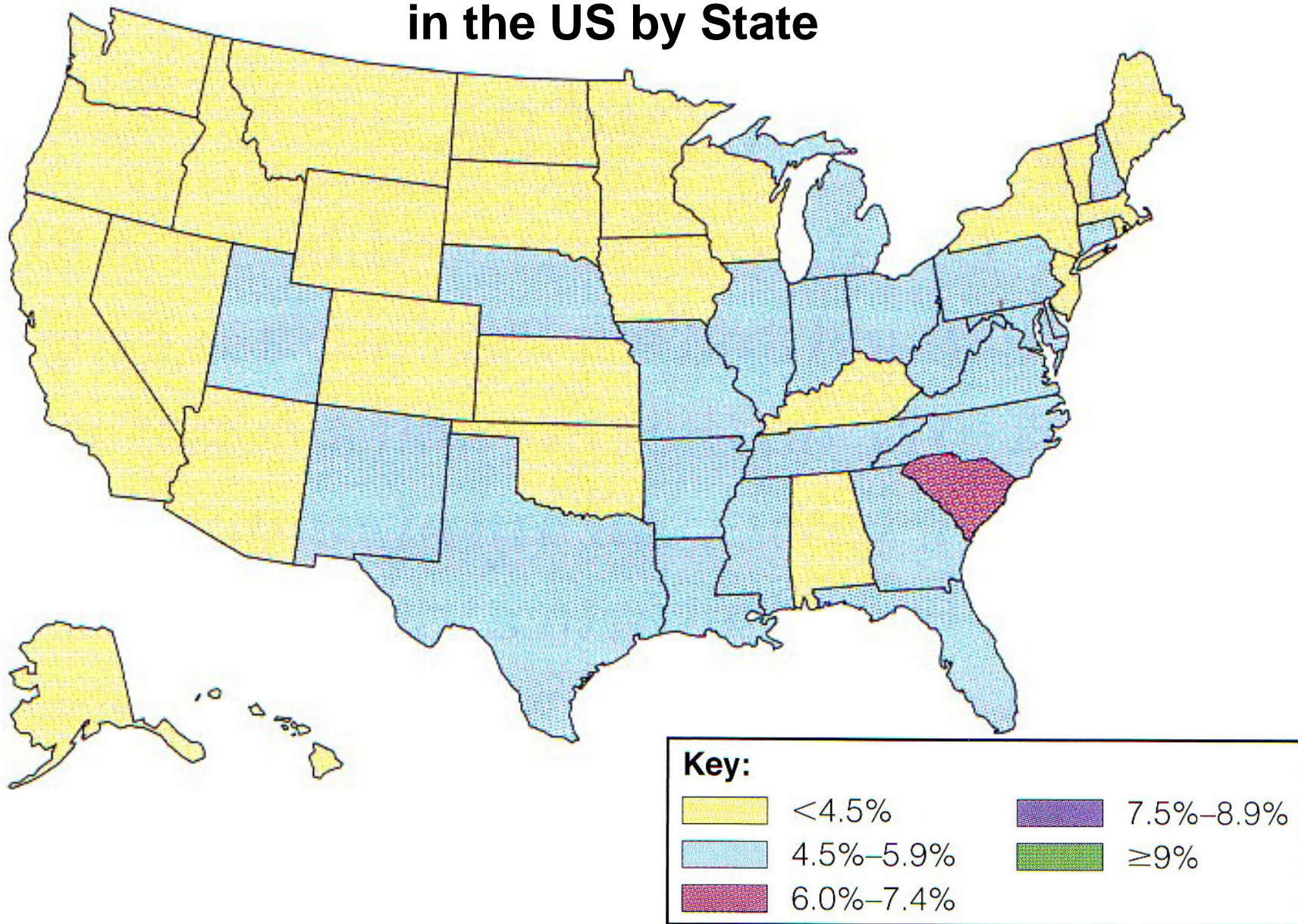


Times of Need!



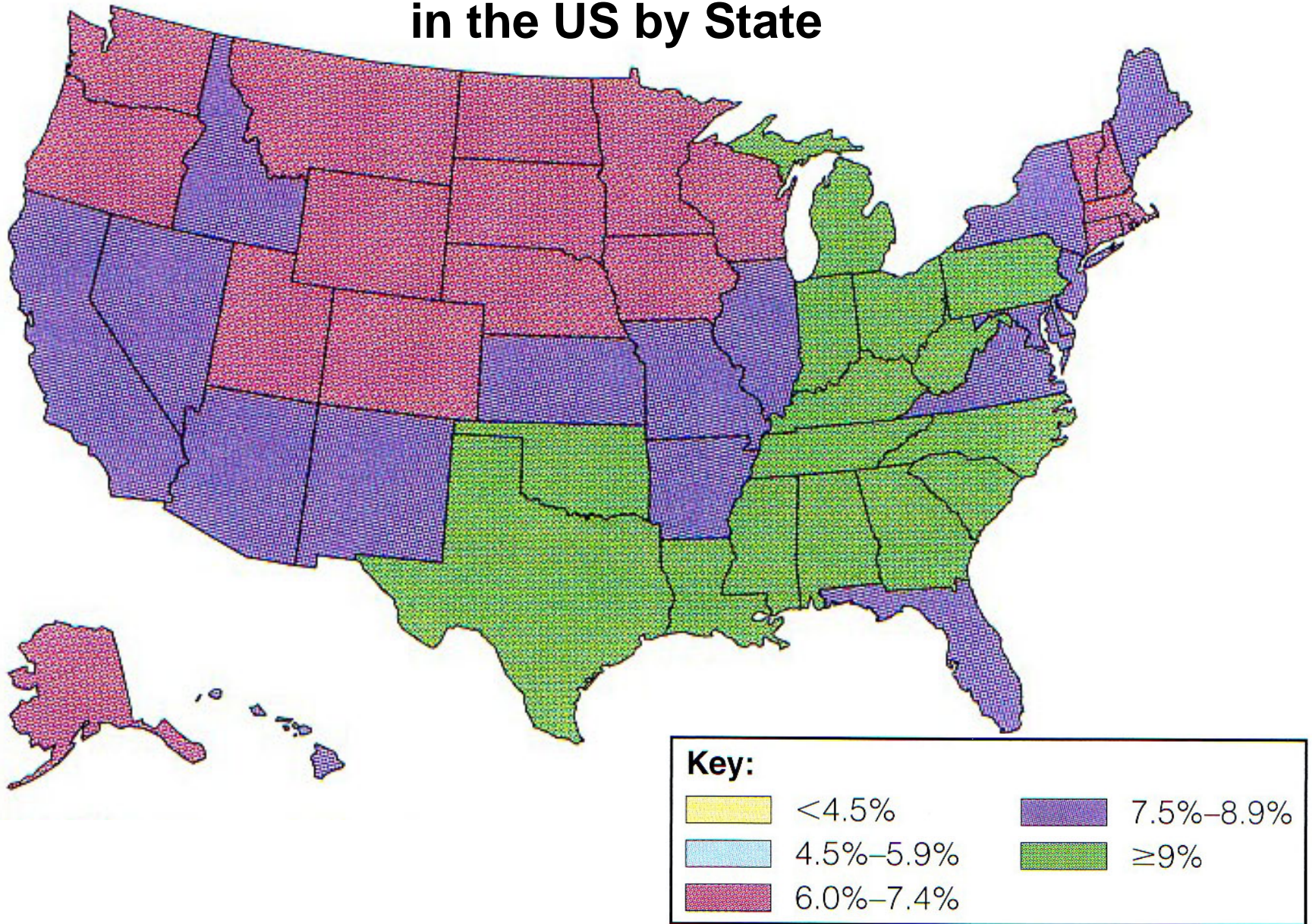


1994 Diabetes Prevalence in the US by State



Source: Centers for Disease Control, Division of Diabetes Translation,
<http://www.cdc.gov/diabetes/statistics>, S&W 2014 fig 4-15 p139A.

2010 Diabetes Prevalence in the US by State



Source: Centers for Disease Control, Division of Diabetes Translation,
<http://www.cdc.gov/diabetes/statistics>, S&W 2014 fig 4-15 p139B.

Type 1 and Type 2 Diabetes Compared

	Type 1	Type 2
Percentage of cases	5–10%	90–95%
Age of onset	<30 years	>40 years ^a
Associated characteristics	Autoimmune diseases, viral infections, inherited factors	Obesity, aging, inherited factors
Primary problems	Destruction of pancreatic beta cells; insulin deficiency	Insulin resistance, insulin deficiency (relative to needs)
Insulin secretion	Little or none	Varies; may be normal, increased, or decreased
Requires insulin	Always	Sometimes
Older names	Juvenile-onset diabetes Insulin-dependent diabetes mellitus (IDDM)	Adult-onset diabetes Noninsulin-dependent diabetes mellitus (NIDDM)

Table 4-9

Warning Signs of Diabetes

These signs appear reliably in type 1 diabetes and, often, in the later stages of type 2 diabetes.

- Excessive urination and thirst
- Glucose in the urine
- Weight loss with nausea, easy tiring, weakness, or irritability
- Cravings for food, especially for sweets
- Frequent infections of the skin, gums, vagina, or urinary tract
- Vision disturbances; blurred vision
- Pain in the legs, feet, or fingers
- Slow healing of cuts and bruises
- Itching
- Drowsiness
- Abnormally high glucose in the blood

- Genetic inheritance
- Excess food energy
- Inadequate physical activity

• Obesity

- Reduced glucose use for fuel
- Increased fat stores

- Enlarged fat mass
- Elevated blood lipids
- Inflammation

• Insulin resistance

- Type 2 diabetes
- Hormone imbalance

Two talk about living with diabetes



Diabetics must constantly juggle diet, exercise & medication to control blood glucose!



Medication

Diet

Exercise

Monitoring blood glucose is a critical step in learning to manage diabetes



Glucose:
Sugar in Blood



Normal: 70-99
Pre-Diabetes: 100-125
Diabetes: \geq 126 mg/dL

Like others, diabetics benefit from whole grains, vegetables, fruits, legumes & non-/low-fat milk products!



Sugar alcohols like xylitol, mannitol & sorbitol can protect teeth against tooth decay



***Exercise is a must based on
its insulin-like effect!***



Just look for these groups to find the carbohydrates in foods!



Sugar in processed foods?



1 Tbs ketchup =
1 tsp sugar



1 Tbs creamer =
2 tsp sugar



1/2 cup canned corn
= 1 tsp sugar



8 oz sweetened
yogurt = 8 tsp
sugar



12 oz cola \geq
10 tsp sugar



2 oz chocolate =
8 tsp sugar

Figure C4-1

Increases in Adult Body Weight over Time

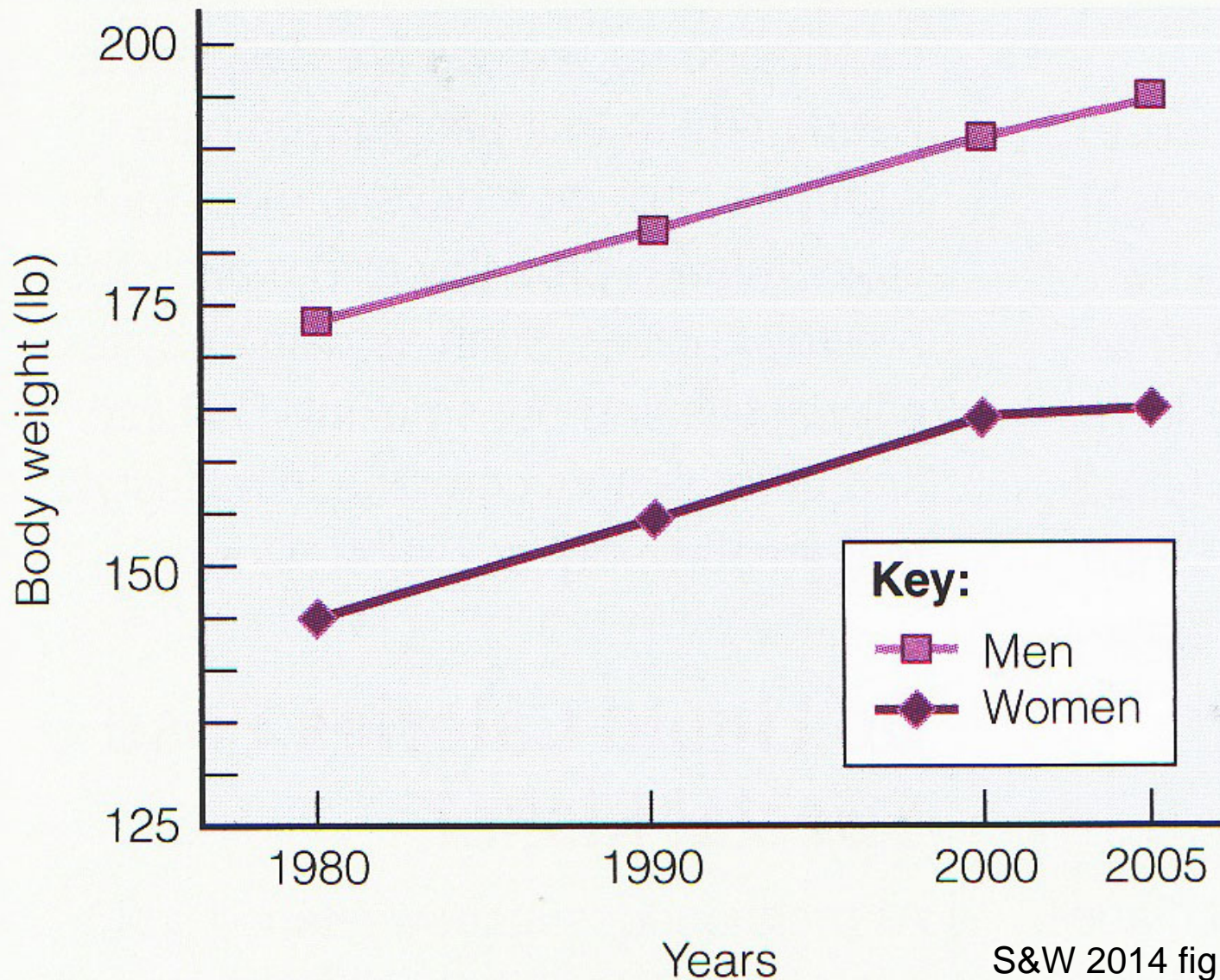
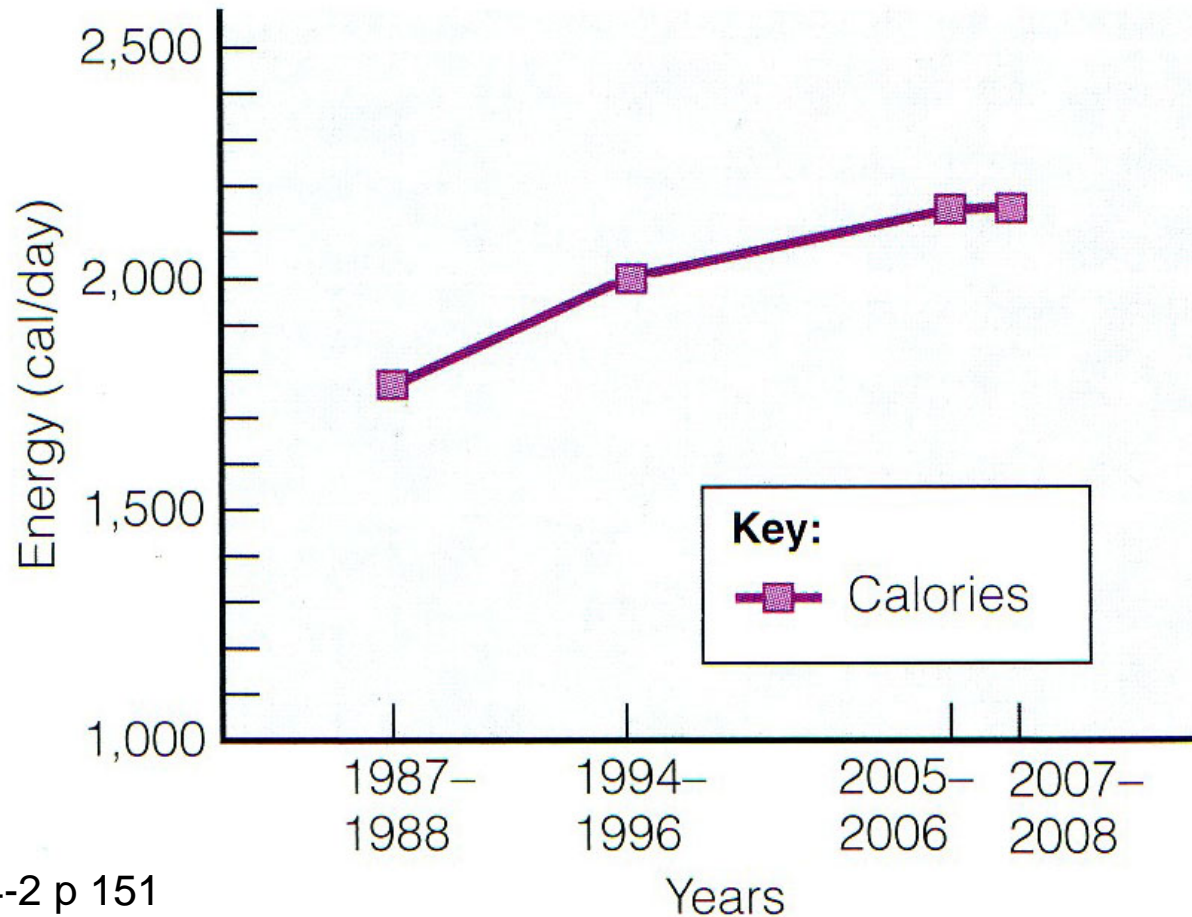


Figure C4-2

Daily Energy Intake over Time

Carbohydrates, and mostly added sugars, account for almost all of the increase in energy intakes during this period.



Sugary Desserts: # 1 calorie source for those 2 yr & older!
Sugar-sweetened Soft Drinks: # 2 for adolescents & young adults!

CINNABON
WORLD FAMOUS CINNABON ROLLS



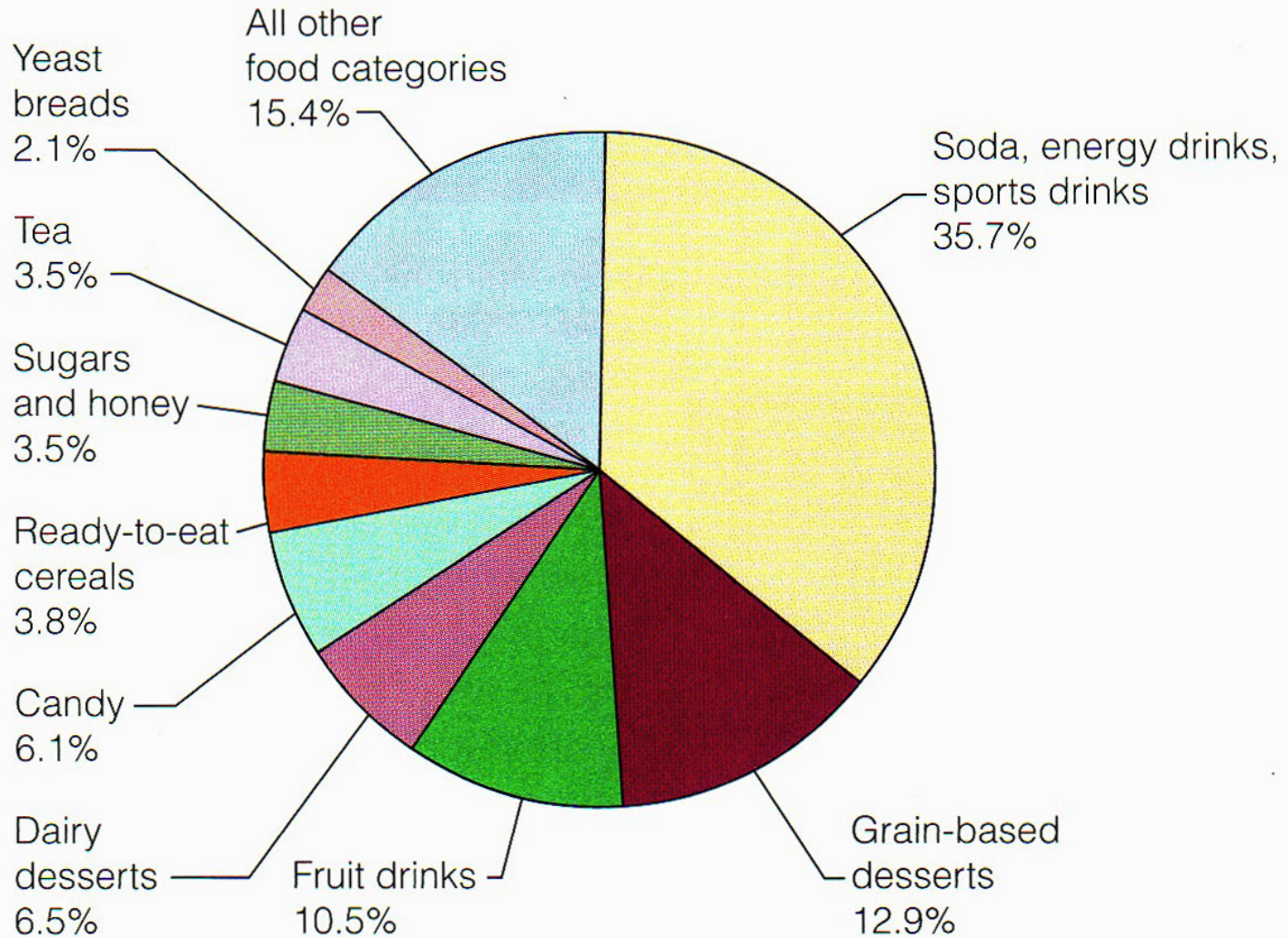


Knock-out punch # 1 & # 2!!



Lynch

Sources of Added Sugars in the U.S. Diet

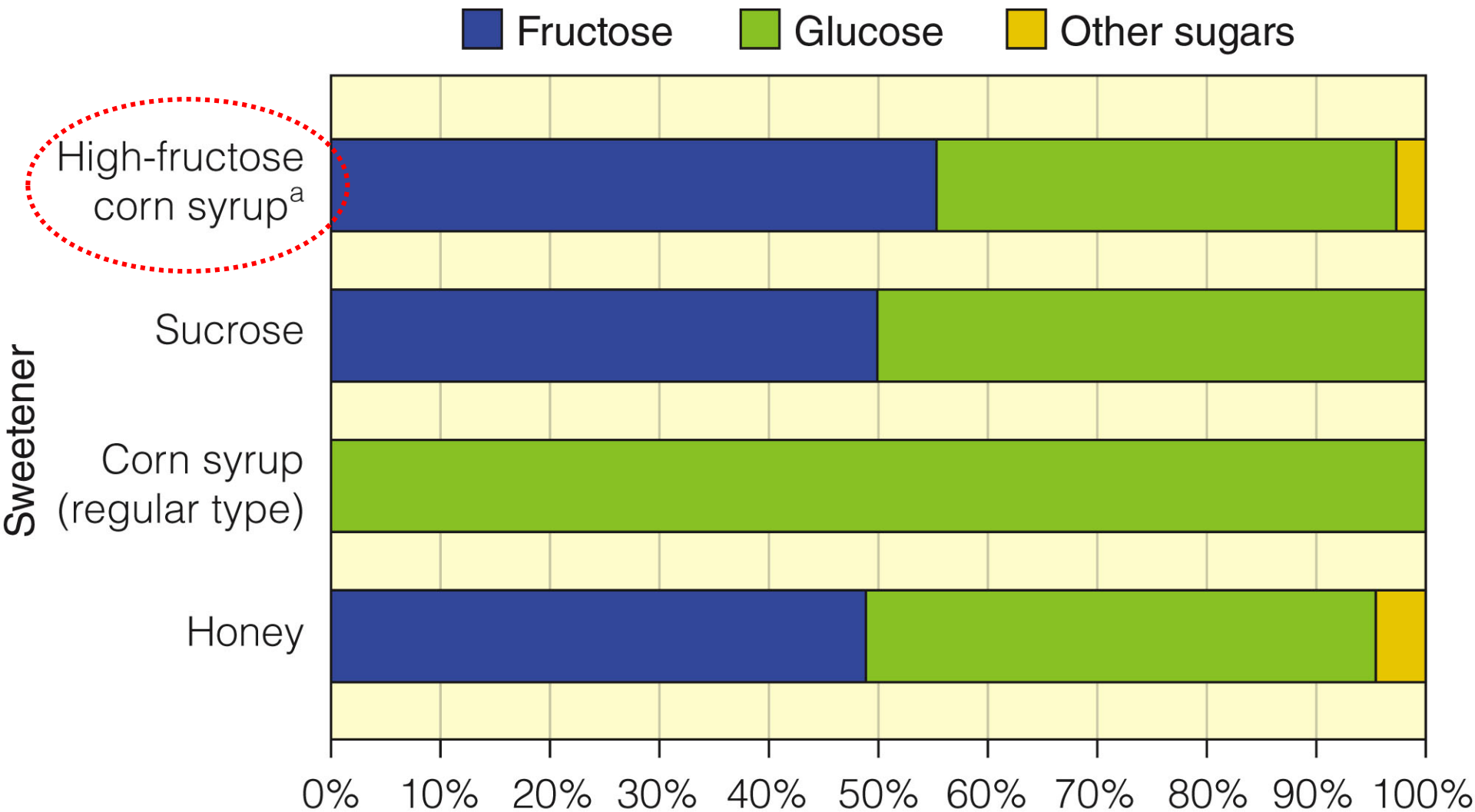


Source: NHANES data, 2005–2006; U.S. Department of Agriculture and U.S. Department of Health and Human Services, Dietary Guidelines for Americans 2010, available at www.dietaryguidelines.gov, p. 29.



Each person in the US ingests ~ ¾ cup or 31 tsp of refined sugars added to foods & beverages each day ~132 lb per year!

Glucose & Fructose in Common Added Sugars



NB: HFCS alters lipid metabolism & promotes fatty deposition in the liver, abdominal obesity & prediabetes!



...Boo!

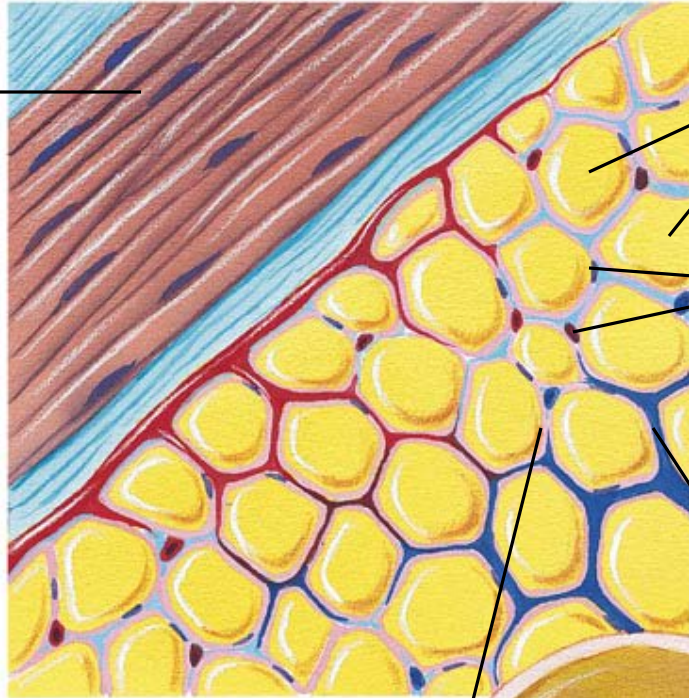
Quiz Bowl, Chapter 4: Group Competition

1. The dietary monosaccharides (monomers) include:
 - a. sucrose, glucose & lactose
 - b. fructose, glucose & galactose
 - c. galactose, maltose & glucose
 - d. glycogen, starch & fiber
2. The polysaccharide that helps form the supporting structures of plants is:
 - a. cellulose
 - b. maltose
 - c. glycogen
 - d. sucrose
3. Enzymatic digestion of carbohydrate begins in the:
 - a. mouth
 - b. stomach
 - c. small intestine
 - d. large intestine
4. When blood glucose rises, the pancreas secretes _____ & when blood glucose falls, the pancreas secretes _____.
 - a. glycogen, insulin
 - b. insulin, glucagon
 - c. glucagon, glycogen
 - d. insulin, fructose

Quiz Bowl, Chapter 4: Group Competition

5. When the body uses fat for fuel without the help of carbohydrate, this results in the production of:
a. ketone bodies b. glucose c. starch d. galactose
6. Foods rich in soluble fiber lower blood cholesterol? T F
7. Type I diabetes is most often controlled by successful weight loss management. T F
8. Around the world, most people are lactose intolerant? T F
9. By law, enriched white bread must equal whole grain bread in nutrient content? T F
10. The fiber-rich portion of the wheat kernel is the bran layer.
T F

Muscle tissue



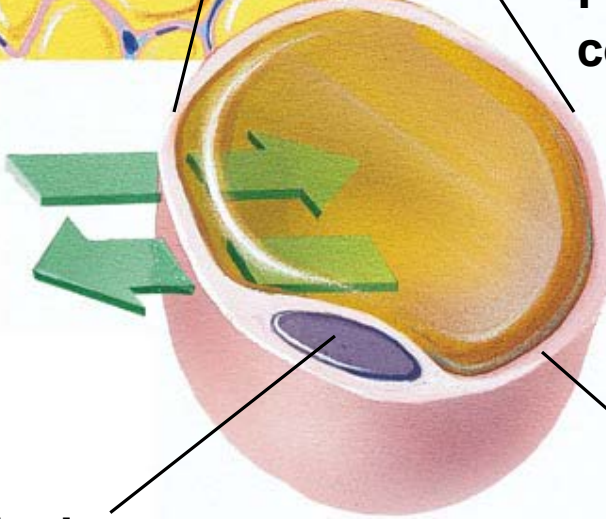
Fat tissue

Blood capillaries

Fat cell

Lipids enter from blood

Lipids exit to blood

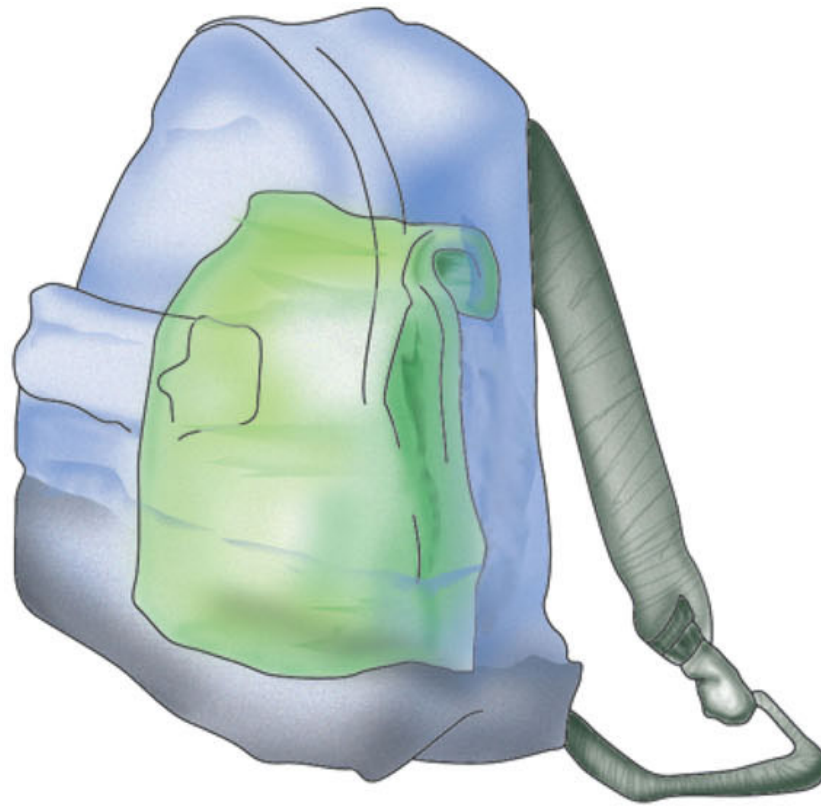


Nucleus

Cell membrane

Fat helps cushion joints & protect internal organs!





Carbohydrate-rich lunch

- 1 low-fat muffin
- 1 banana
- 2 oz carrot sticks
- 8 oz fruit yogurt

calories = 550

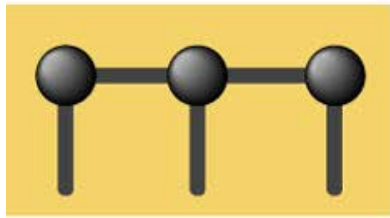
weight (g) = 500



Fat-rich lunch

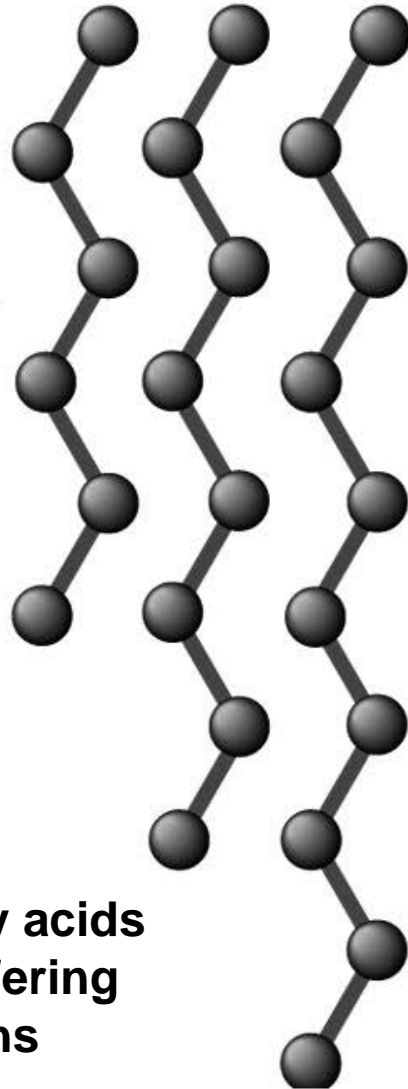
6 butter-style crackers
1¹/₂ oz American cheese
2 oz trail mix with candy

calories = 550
weight (g) = 115

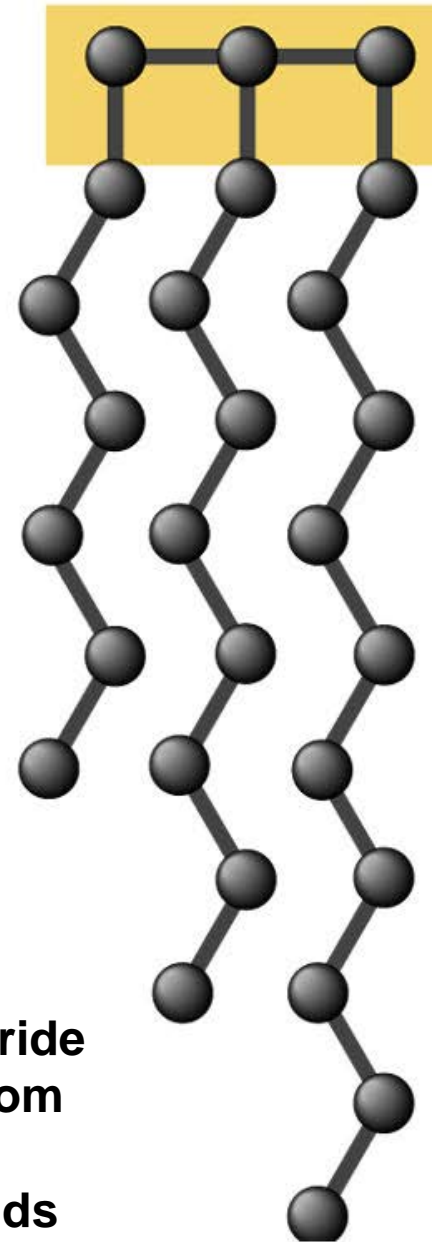


Glycerol

+



**3 fatty acids
of differing
lengths**



**A triglyceride
formed from
1 glycol +
3 fatty acids**

***Small
amounts of
fat offers
pleasure &
essential
nutrients!***



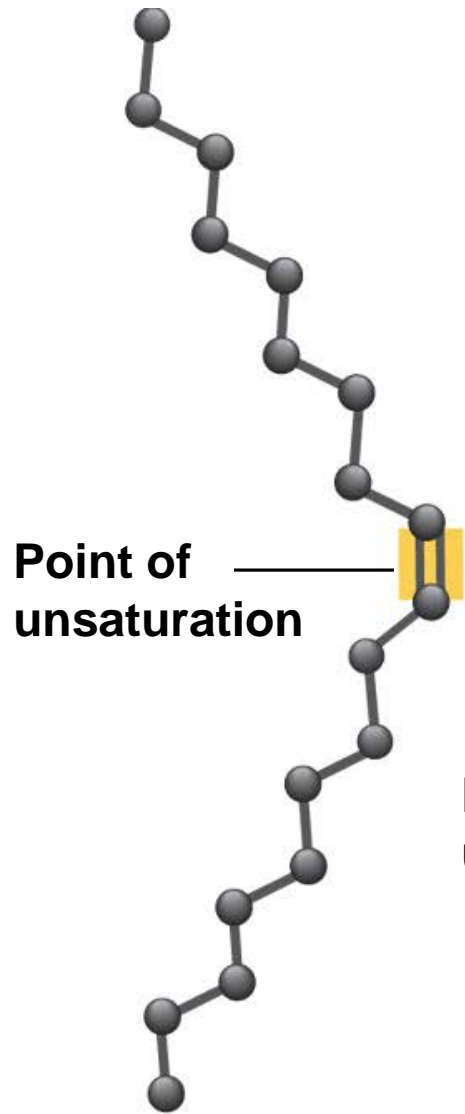
***The more unsaturated the fat, the more liquid it is at room T°C.
The more saturated the fat, the higher the T°C at which it melts.***



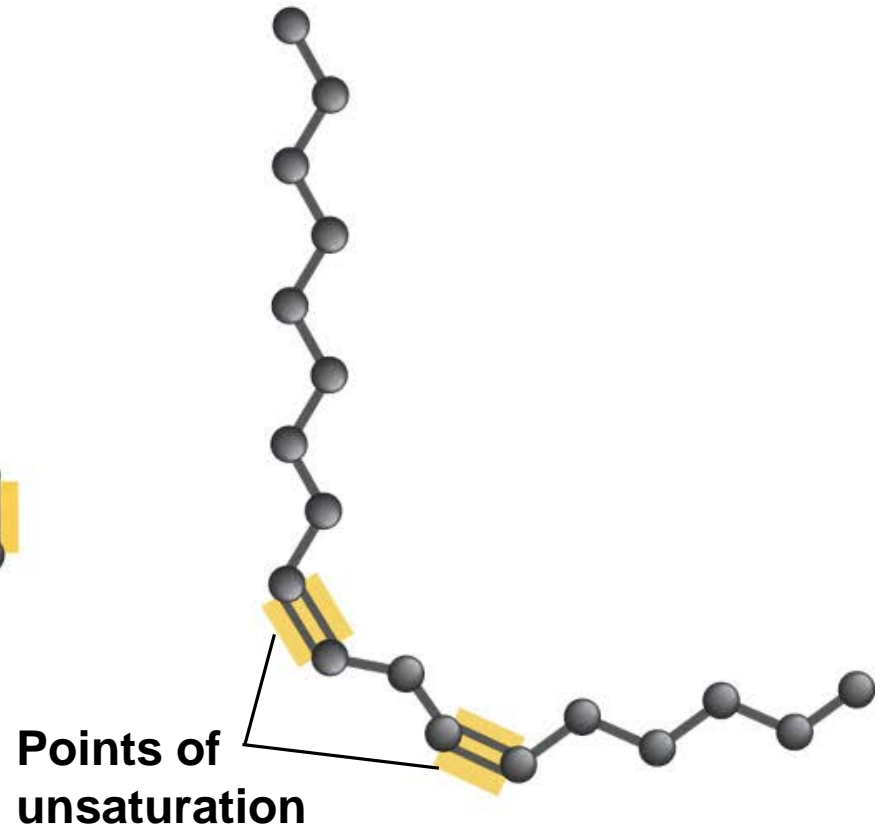
Saturated

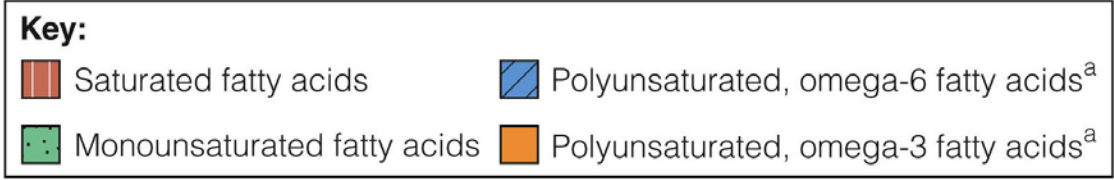


Monounsaturated

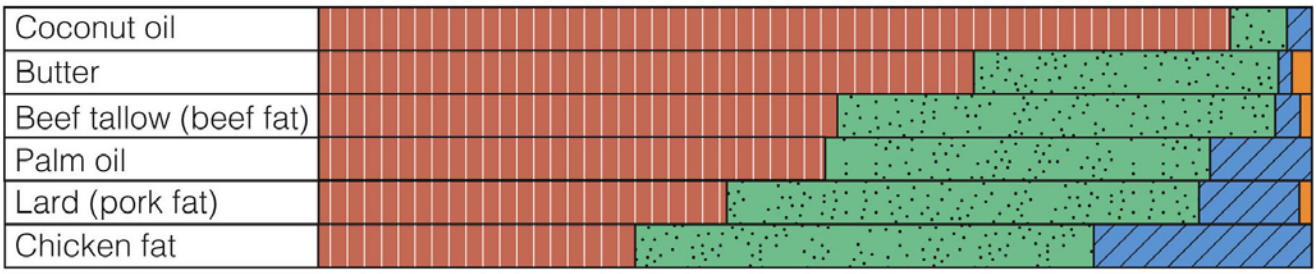


Polyunsaturated

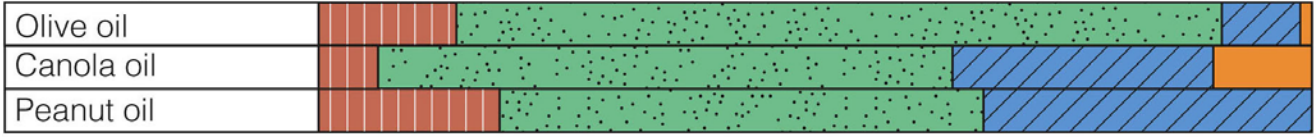




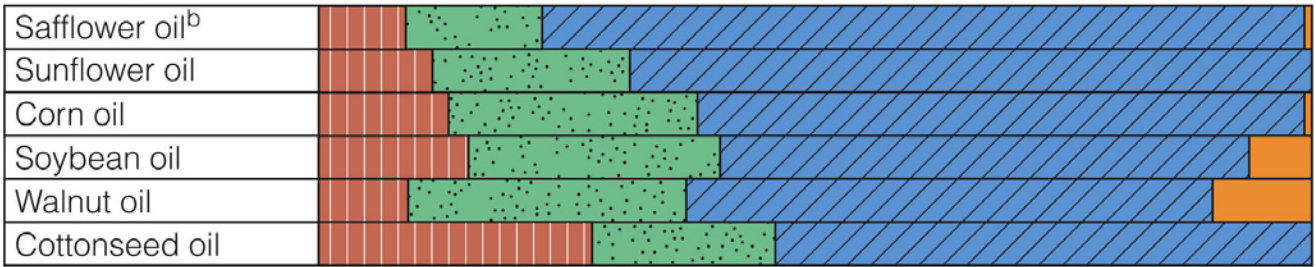
Animal fats and the tropical oils of coconut and palm contain mostly saturated fatty acids.



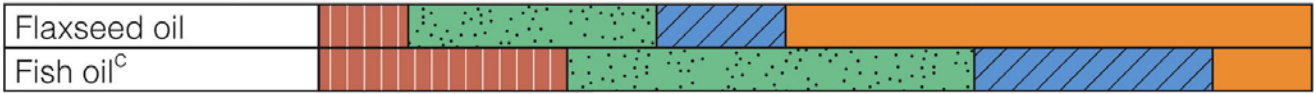
Some vegetable oils, such as olive and canola, are rich in monounsaturated fatty acids.



Many vegetable oils are rich in omega-6 polyunsaturated fatty acids.^a



Only a few oils provide significant omega-3 polyunsaturated fatty acids.^a



^aThese families of polyunsaturated fatty acids are explained in a later section.

^bSalad or cooking type over 70% linoleic acid.

^cFish oil average values derived from USDA data for salmon, sardine, and herring oils.

Emphasize good fats from plant sources like avocados!

