

Survey of Biology

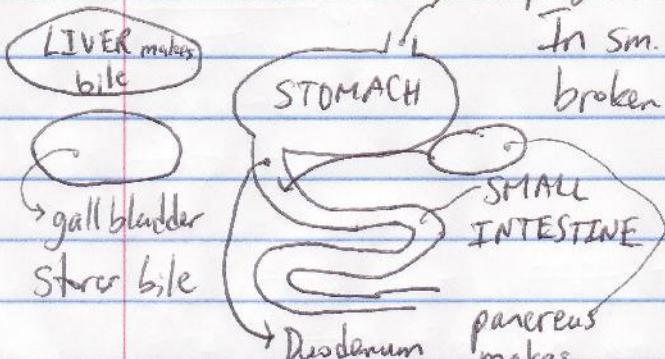
wk. 6

Thripp
Survey
Pg. 1

Tue, 2009-10-06 9:30-10:50 AM:

Sm. intestine is longest part of alimentary canal. It's small because it's narrow.

Esophagus



In sm. intestine, everything is broken down into monomers

& absorbed (starch, nucleic acids, protein, lipid).

We absorb monomers in the small intestine.

Pancreas & sm. intestine make many enzymes to break down food into monomers.

alkali (pH 7+) to neutralize acid (pH 2)

Also enzymes (many)

bile attacks

Bile emulsifies fat.

big fat drop

sm. fat drops

↳ breaks down into small droplets (lipids have no monomer)

Bile molecules separate fat molecules by polar forces (neg. or pos; true)

Pancreatic alkali (basic juice, pH 7+) neutralizes stomach acids (pH 2-6), makes small intestine basic (7.0+ pH), & has at least ~~at~~ hydrolyases.

4 ↗ my deduction

Sm. intestine secretes: Proteases, Lipases, Nucleases, Carbohydrases

↳ sometimes hydrolyases do not work, i.e. Mad-cow disease where proteases fail

↓
digests carbs to simple sugars (monosacs.)
↓
lipids to glycerol + fatty acids
↓
DNA/RNA to nucleotides
↓
digests carbs to simple sugars (monosacs.)
↓
digests proteins to ~~amino~~ amino acids

Thripp
Survey

Tue 2009-10-06 9:30-10:50 AM MARKER: 9:55AM Pg. 2

Villi and microvilli help absorb nutrients in sm intestine

Capillary absorbs AA + nucleotides + monosac. (capillary in villus)

Lymph system absorbs glycerol & fatty acid villus = singular
villi = plural

Epithelial cells of sm intestinal wall have microvilli which absorb monomers at the cellular level. Microvilli greatly increase the surface area of the sm intestine (to the size of a tennis court ☺).

Lg intestine collects water. Colon makes up most of lg. intestine and absorbs water leaving feces.

Too much water = diarrhea lg. intestine must be

Not enough water = constipation balanced in water absorption

Rectum = last 6 inches of lg. intestine

Anus = regulates opening of rectum (sphincter)

Food processing along alimentary canal → ingestion by mouth

2. chewing in mouth, churning of stomach (both mechanical)

3. chem digestion: saliva, acid + pepsin (stomach), hydrolyses (sm. int.)

Sm. intestine makes enzymes for itself!

Pancreas also supplies enzymes.

Homeostasis = balance of temperature & pH achieved through a balanced diet

3-5 vegetables/day

& 2-4 fruits/day

YOUR BODY doesn't need

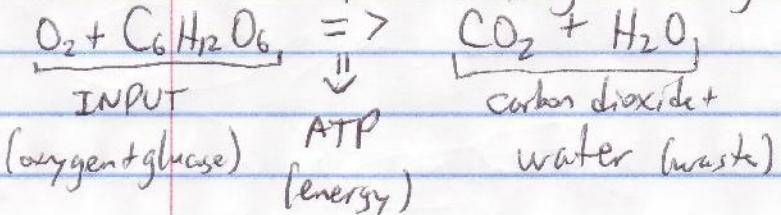
sugar, nucleotides, or fat

IT can make them

however, Raa's in proteins are NEEDED

Tue. 2009-10-06 9:30-10:50 AM MARKER 10:15 AM

Cells break down organic molecules (lipids, proteins, carbs, DNA/RNA) in cellular respiration, generating ATP (energy)



Chemical calorie: raise 1g of water 1°C .

Chem. kilocaloric (Calorie): raise 1000g of water 1°C .

→ all "calories" on food labels are in fact kilocalories
= Calorie w/ a capital "C"

→ NOT 1g of water 1000°C . - because transitioning to gas (steam) takes more energy!

Cheeseburger ($\frac{1}{4}$ lb.) = 3 hrs. 30 min of walking to burn off
(if you weigh 150 lb.)

Exercising is still good to build muscles and increase your metabolic rate.

Essential nutrients CANNOT be made by the body, i.e.

8 of 20 amino acids. They must be eaten

→ valine, histidine, threonine, phenylalanine, leucine, isoleucine, tryptophan, lysine

12 of 20aa's aren't essential... they are made by the body

→ Vitamins mainly assist enzymes in the mitochondria

Fat-soluble vitamins ADEK ... can be overdosed!

Water-soluble " " : C, B1, B2, B3, B6, B12, etc. urinated if overdosed

OVER →

Thripp
Survey

Tue 2009-10-06 9:30-10:50 AM MARKER: 10:30 AM Pg. 4

Minerals: required: iron, zinc, copper, iodine, manganese, calcium

Essential Fatty Acids... there are some (slide went too fast)

Protein deficiency causes stomach
bloating... common in Africa

I am overweight
5'9" 170lb.
BMI 25

chew → acid/pepsin → hydrolyses → water absorption → elimination
mouth → pharynx → esophagus → stomach → duodenum ☺ →
sm. intestine (help from liver, gallbladder, pancreas) → lg. intestine
→ anus

glycerol and fatty acids are MONOMERS for FAT

I don't know why review 1 had "more" as lipid

* lactose & sucrose are disaccharides NOT lipids

They are only digested in the sm. intestines. as lipids

Tue 2009-10-06 12:30-1:50 PM MARKER: 12:40 PM includes

Liver makes bile. Bile is stored in gallbladder SUPPLEMENTAL cholesterol

[] polar] bile salt emulsification is done in sm. intestine & liver
[] non-polar molecules

alkali from pancreas

neutralizes stomach acid

flowing into sm. intestine

bile → \ddots : stomach enzymes -FAT— become denatured

in sm. intestine —

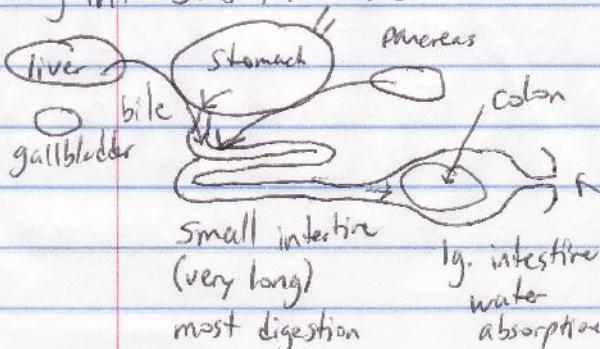
wrong pH. so: only sm. int.,

liver, & pancreas contribute

enzymes \rightarrow chem. dig. in sm. int.

(comes out — cannot be

processed further)



SUPPLEMENTAL

Thripp
Survey
Pg. 5

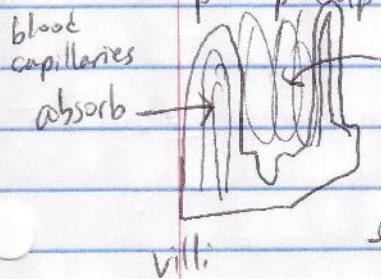
Tue. 12:30-1:50 PM, 2009-10-06 MARKER: 10:50A

We're like caterpillars except we've wrapped our body around our digestive tract

12:55 PM

Villi in sm. intestine have:

- blood vessels to transport monomers (aa, nucleotides, monosacs.)
- lymph system transports glycerol & fatty acids to liver to be ~~oxidized~~ packaged into triglycerides and phospholipids



Microvilli absorb the monomers.

T/F: Monomers are absorbed in the microvilli.

TRUE

epithelial cells in sm. intestine have villi

the

Lg. intestine absorbs water in colon, the largest part of the lg. intestine. The lg. intestine also includes the rectum.

the primary function of the sm intestine is absorption of nutrients

the primary function of the lg. intestine is absorption of water.

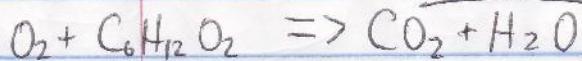
homeostasis = balance of temp. and pH

you should eat 5-9 combined servings of fruits & vegetables daily

& I Cells break down organic molecules in cellular respiration

ATP molecule = "cash" molecule = "pays" cells to move

like muscle movement IN MITOCHONDRIA



ATP

↓ 2000 Calories/day = 2,000,000 chem calories/day

A slice of bread takes 30 minutes to walk out.

SUPPLEMENTAL

Thripp
Survey

Tue, 2009-10-06 12:30-1:50 PM MARKER: 1:25 PM Pg. 6

Essential nutrients cannot be made by our bodies.

The 8 essential amino acids take a lot of ATP to make.

So we've evolved to require them in food.

☺ B-Complex vitamins help your body make energy.

It's hard to find a loaf of bread that does not have high-fructose corn syrup.

not good for you

Protein deficiency causes bloating

common in Africa

NOT fat..

hydrolyase enzymes break down covalent bonds

(dehydration synthesis) by the reciprocal process,
hydrolysis

MOUTH → SALIVARY GLANDS → CHEWING → SALIVARY AMYLASE

STOMACH → PEPSIN (PROTEIN DECOMPOSITION) → ACID → CHURNING

SM. INTESTINE → LIVER → GALLBLADDER → PANCREAS → ENZYMES →

ABSORPTION

END ☺