

These notes are extremely comprehensive and cover the entire semester of lectures.

A lot of notes I've seen contain a lot of full sentences; I learn best when the clutter is removed, therefore in these notes, I've summarised most information as tables, bullet points & pictures, I've also removed the unnecessary 'filler' words – hopefully this makes studying easier for you!

These notes contain:

- Information taken from lectures slides & Tapsell the textbook
- Personal comments & tips to ace the exam
- **Self-made diagrams:** I'm a visual learner, that's why there are quite a few diagrams throughout the notes (this is also why titles are different colours)

In this course I achieved a 7 (out of 7) with these notes

Anything I have marked like ****Title or question**** (i.e. purple or with asterisks) means this information was essential for the final exam (note that exams are different every year)

Macronutrients - Protein

Protein Functions:

- Forms antibodies
- Maintains normal blood osmotic pressure
- Produces Hemoglobin, enzymes and many hormones

Polypeptide examples: insulin & haemoglobin

Prevalence of malnutrition in hospitals = 40%

Protein digestion:

1. Mouth
2. Stomach - HCl, pepsinogen to pepsin
3. Small intestine - hydrolysis reactions, peptidase enzymes

Protein requirements: 0.75g/kg/day (RDI= 64g men, 46g women)

Essential Amino Acids:

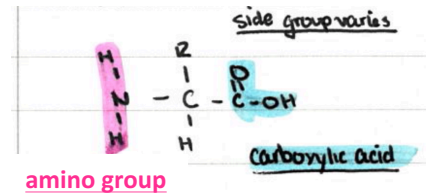
1. Histidine
2. Isoleucine
3. Leucine (triggers protein synthesis)
4. Lysine
5. Methionine
6. Phenylalanine
7. Threonine
8. Tryptophan
9. Valine

A way to remember the list of essential amino acids:

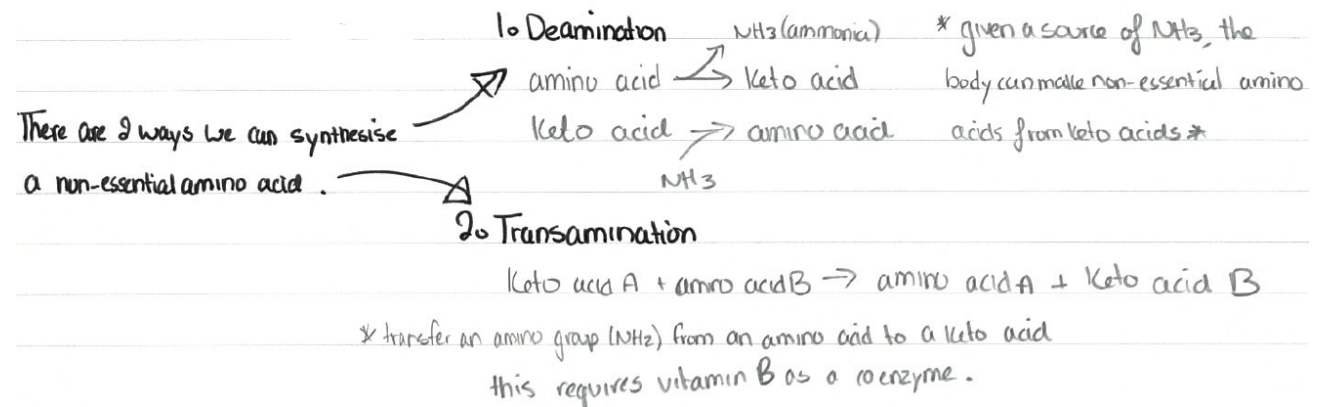
Harry and Ike liked leaving messes.
Phil and Tom tried vacations

Amino Acid Structure:

**** Protein contains nitrogen, carbs and fats don't****



There are 2 ways our bodies can synthesise non-essential amino acids



Amount of energy in 1g of macronutrients:

1g protein \rightarrow 17kJ

1g carb \rightarrow 16kJ

1g fat \rightarrow 27kJ

Amount of protein in these:

250ml milk - 9g

2 eggs - 12g

2 slices white bread - 6g

200g steak - 45g

Four main proteins in the body:

Collagen, haemoglobin, myosin, actin

Macronutrients - Carbohydrates

Monosaccharides: glucose, galactose, fructose (only diff. is position of hydroxyl)

Disaccharides: sucrose, lactose, maltose

Oligosaccharides: malto-oligosaccharides

Polysaccharides: starch, glycogen

Lactose = glucose + galactose

Sucrose = glucose + fructose

Maltose = glucose + glucose

Carbohydrate/ Starch Digestion:

1. Amylase in mouth (partly) breaks down long-chain polysaccharides into monomers
2. Digestion in stomach is minimal
3. Most digestion occurs in small intestine
 - Pancreatic enzymes break polysaccharides into monomers (e.g. amylase, lactase)
 - Villi absorb monosaccharides in small intestine
4. Liver then converts fructose & galactose into glucose

****Know amount of carbohydrates in these foods:****

Can of coke	White bread slice	Glass of milk	Banana
50g	15g	13g	20g

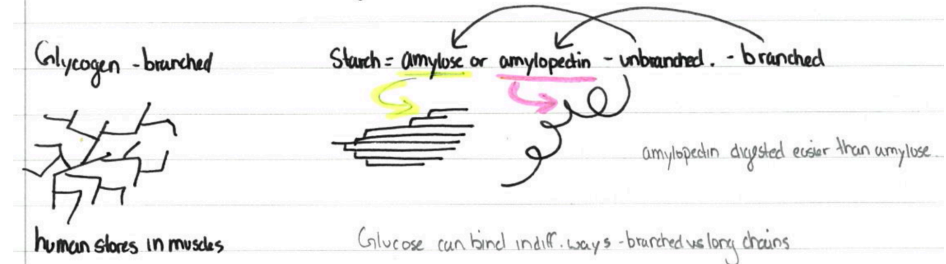
Polysaccharides: starch & glycogen

Glycogen is branched - stored in muscles

****Carbs are stored in body as:****
Triglycerides & glycogen

Starch has 2 forms:

- **Amylose** = unbranched
- **Amylopectin** = branched



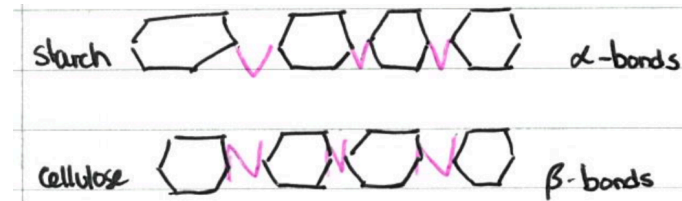
3 classes of Fibre (indigestible polysaccharides)

1. Soluble fibres
2. Insoluble fibres
3. Resistant starches

Starch vs Cellulose (both made of glucose)

Starch: alpha bonds (can digest)

Cellulose: beta bonds (can't digest because our enzymes can't get around beta bonds)



Blood Glucose Homeostasis: Insulin & Glucagon

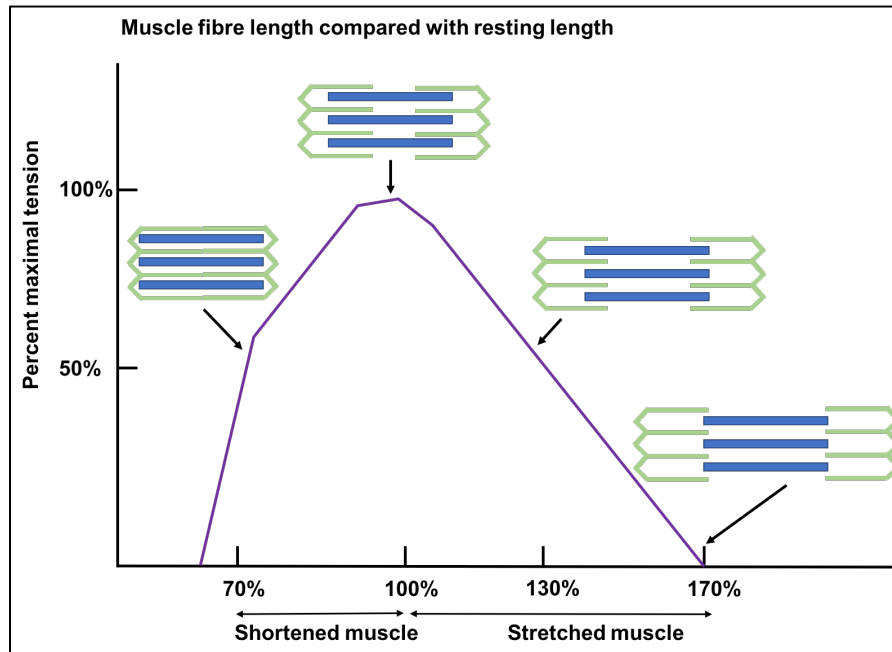
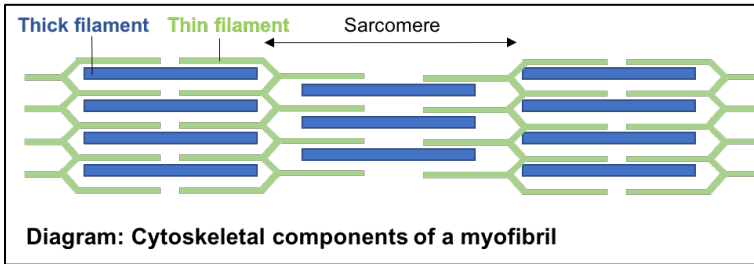
Glucagon: releases glucose into the blood stream

Insulin: promotes glucose uptake by liver

Strength, Muscular Endurance and Flexibility

Muscle Anatomy

- Muscle fibre = a single muscle cell
 - Within a muscle fibre are myofibrils which contain
 - Thick filament = myosin
 - Thin filaments - actin
- They make up the sarcomere which when it contracts, produces force
- Contractile/ force generating capacity of the muscle
 - When muscle is at its resting length, it can produce most amount of force



Resistance Training Jargon

Strength = max. force that a muscle can generate in specific conditions

Power = rate of doing work (product of strength and speed)

Muscular Endurance = ability of muscle to sustain near maximal force (reps)

Repetition (rep) = one movement of an exercise

Set = group of reps performed continuously

Repetition Maximum (RM) = max weight that can be lifted for a specific no. repetitions

Isotonic muscle action - movement of a body part

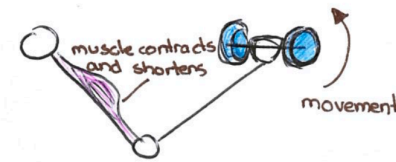
Isometric muscle action - muscle exerting force without movement

Concentric muscle action - muscle exerts force while shortening

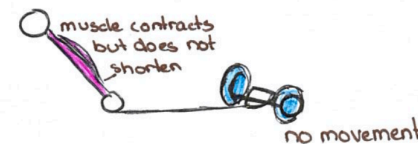
Eccentric muscle action - muscle exerts force while lengthening

Isometric vs. Isotonic Contraction

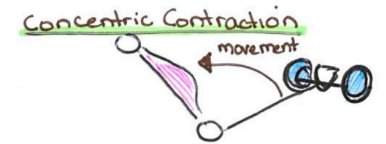
Isotonic Contraction



Isometric Contraction



Concentric vs. Eccentric Contraction



Eccentric Contraction

