



Maureen Gale
UGI Specialist Dietitian

15/1/24




University Hospital Southampton
NHS Foundation Trust

Planets Support Group
Nutrition Presentation



Protein

- 
- What is protein?
 - Why we need it?
 - What factors cause muscle loss
 - How much protein do you need?
 - Where can you get protein from?
 - Protein Powders/Drinks
 - Whey and Casein Protein



Protein – What is it?

- Protein is a macronutrient
- Made up of chains of amino acids
- Which are building blocks of protein.
- Protein from foods or drinks
- Broken down to amino acid by enzymes in your digestive system
- Amino acids are transported to the liver which sends them to your muscles
- Muscles use the amino acids to synthesise new protein – for the structure and function of your muscle fibres
- Large variety of roles in our organs
 - brain, heart and liver, the antibodies in our immune system and the haemoglobin that carries oxygen in our blood.

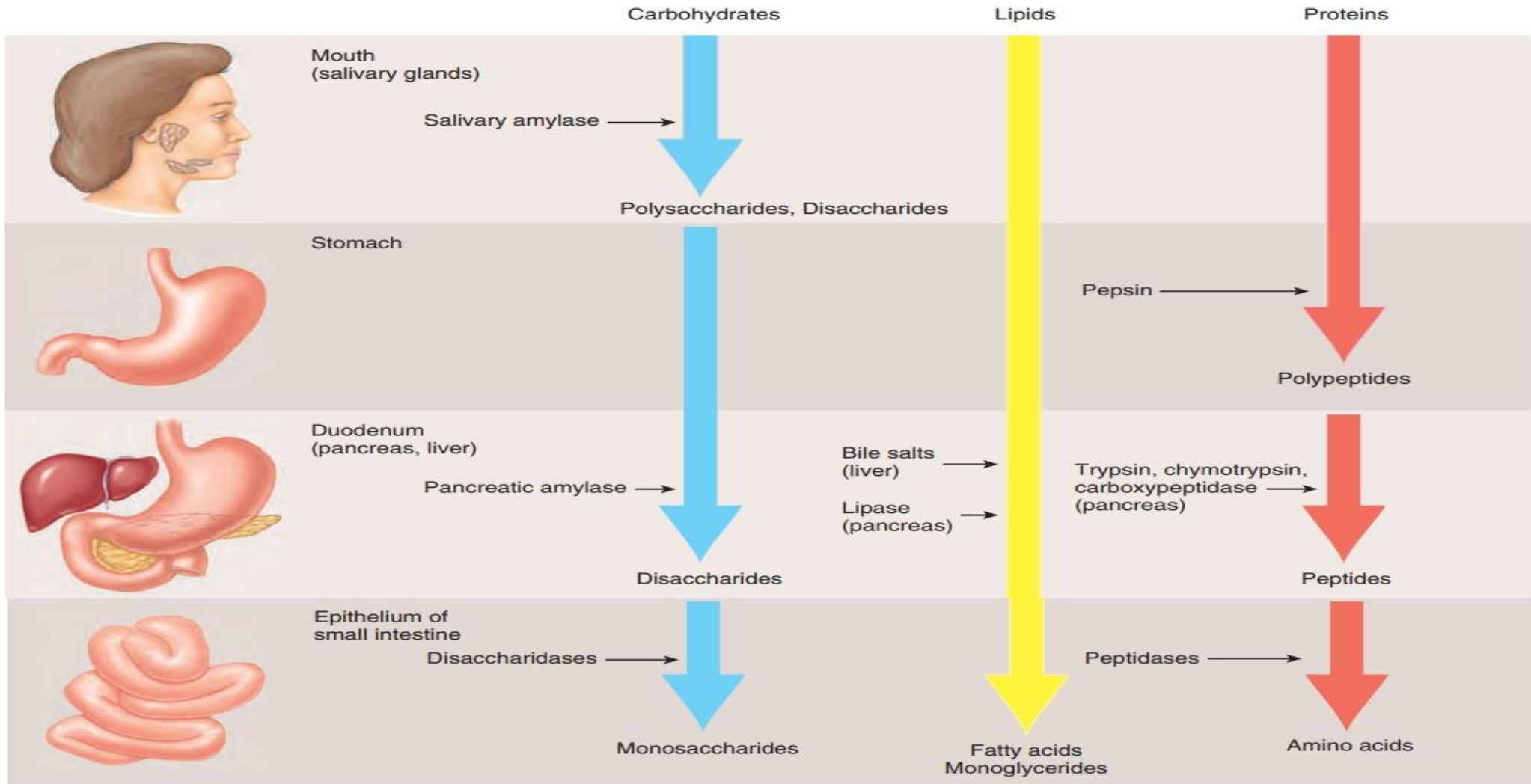
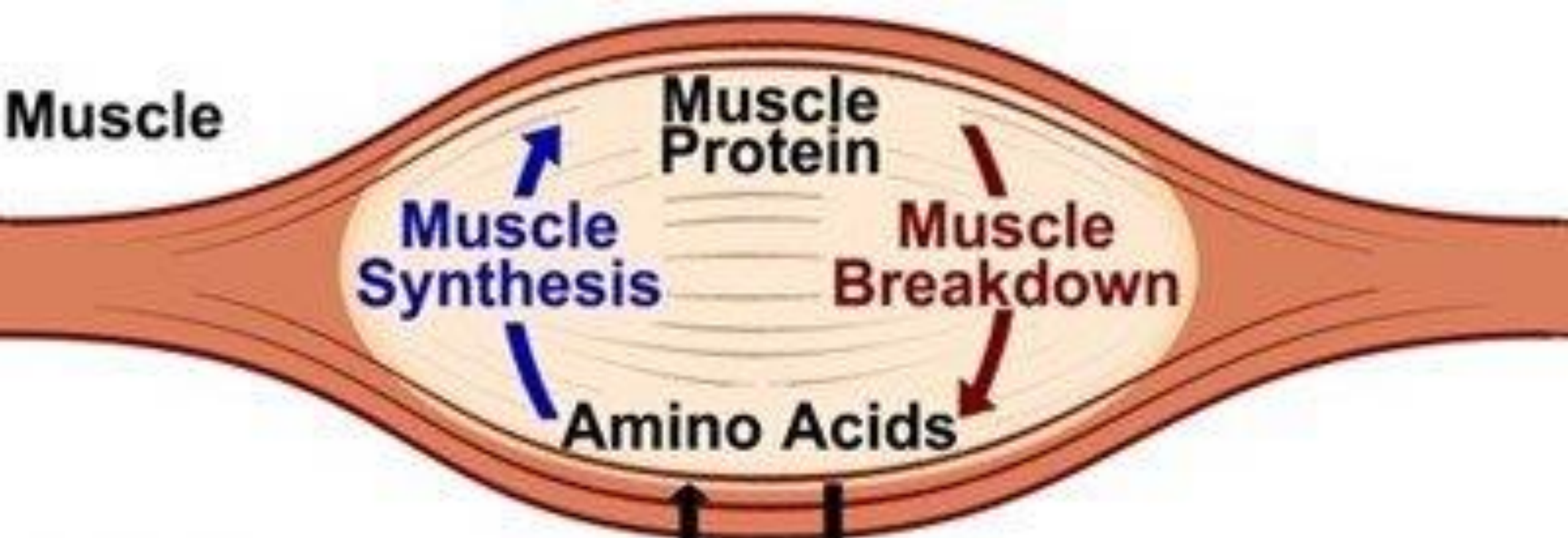


Figure Digestion of Carbohydrates, Lipids, and Proteins

The enzymes involved in digesting carbohydrates, lipids, and proteins are depicted in relation to the region of the digestive tract where each functions.

Muscle



Muscle Protein

Muscle Synthesis

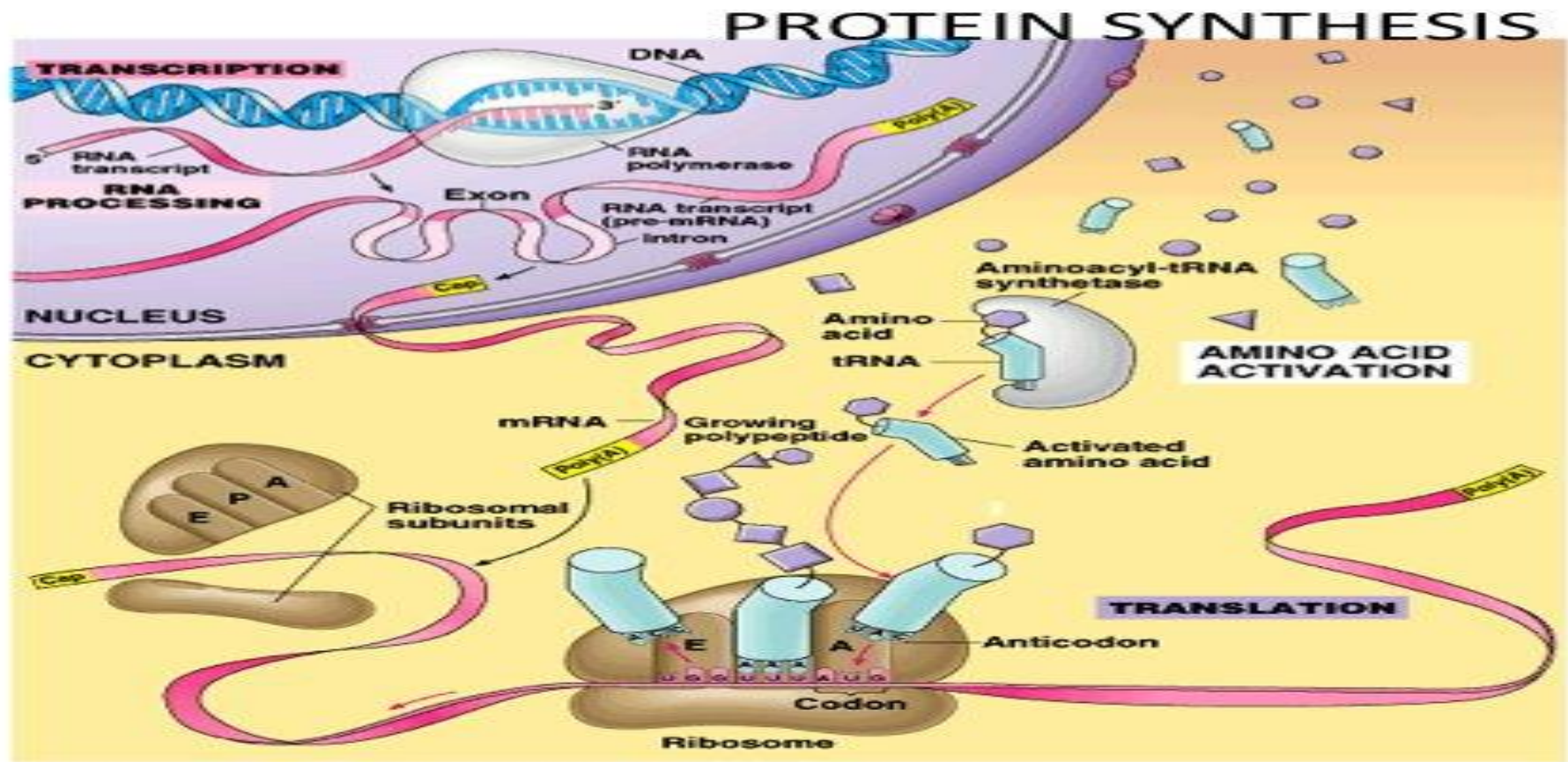
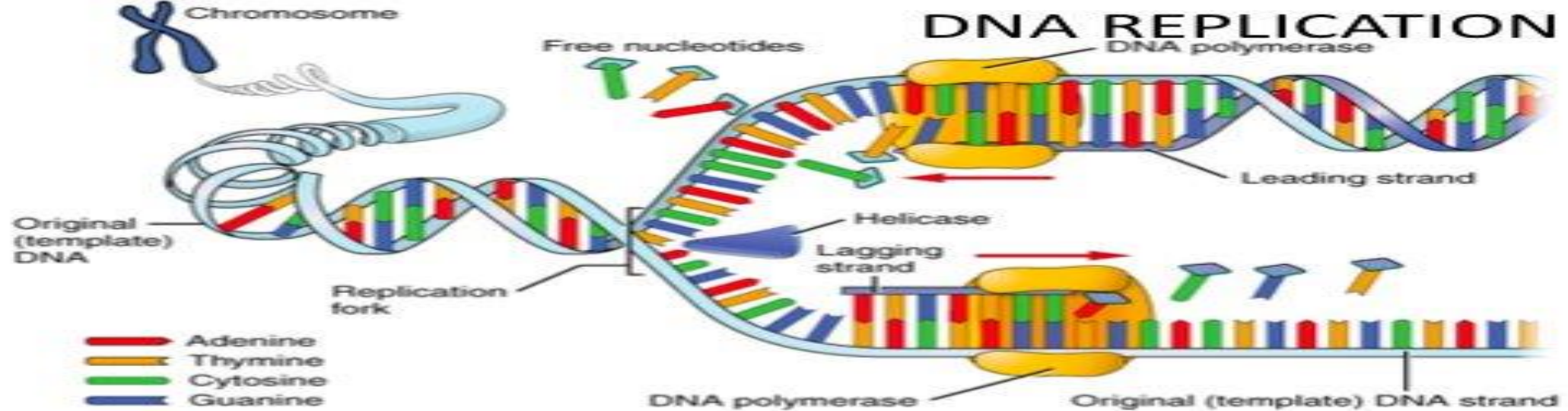
Muscle Breakdown

Amino Acids



Amino Acids

Blood



Factors Which Can Cause Muscle Loss

Ageing Age-associated muscle mass	The main cause is ageing as the motor neurones in the body gradually die and no longer communicate to the brain. This causes muscle fibres to then deteriorate. This process can then be accelerated by factors like poor diet or inactivity.
Hormone changes	Testosterone - the central hormone involved in the development of muscle loss. Growth hormone deficiency leads to loss of muscle mass but not strength. Menopause in women is a period of immense hormonal transition that is linked to a loss in muscle mass and increase in fat mass. In men, there is a reduction in testosterone by 1% each year leading to reduced muscle mass.
Diseases	Recent evidence suggests that chronic, low-grade inflammation also contributes to the loss of muscle mass, strength and functionality.
Inactivity	Sedentary behaviour can further accelerate age-related decline in muscle mass, leading to a decrease in metabolic rate.
Malnutrition	Malnutrition increases the risk of muscle loss by three or four times.

How Much Protein Do We Need?

- Protein recommendations are based on how much we need per kilogram (kg) of our bodyweight,
 - Adults - 0.75g per kg of bodyweight.
 - Current recommendations are 56g/day for men and 45g/day for women (based on bodyweights of 75kg for men and 60kg for women)
 - Men are eating about 85g and women about 67g of protein a day.
 - For older adults (>65 years) recommendations. to maintain and regain lean body mass require 1.0-1.2g protein/kg body weight,
 - Higher amounts for active/exercising older adults (≥ 1.2 g/kg/day)
 - Acute or chronic disease (1.2-1.5g/kg body weight/day).

Which Foods and Drinks Provide Protein?



- Many different foods and drinks provide protein.
- In the UK Government's healthy eating model the Eatwell Guide, foods that provide protein are found in the food group called 'Beans, pulses, eggs, fish, meat and other proteins'.
- Milk and dairy products, such as cheese and yoghurt, are also good sources of protein.
- There are good food sources of protein based on whether they are from animals or plants.



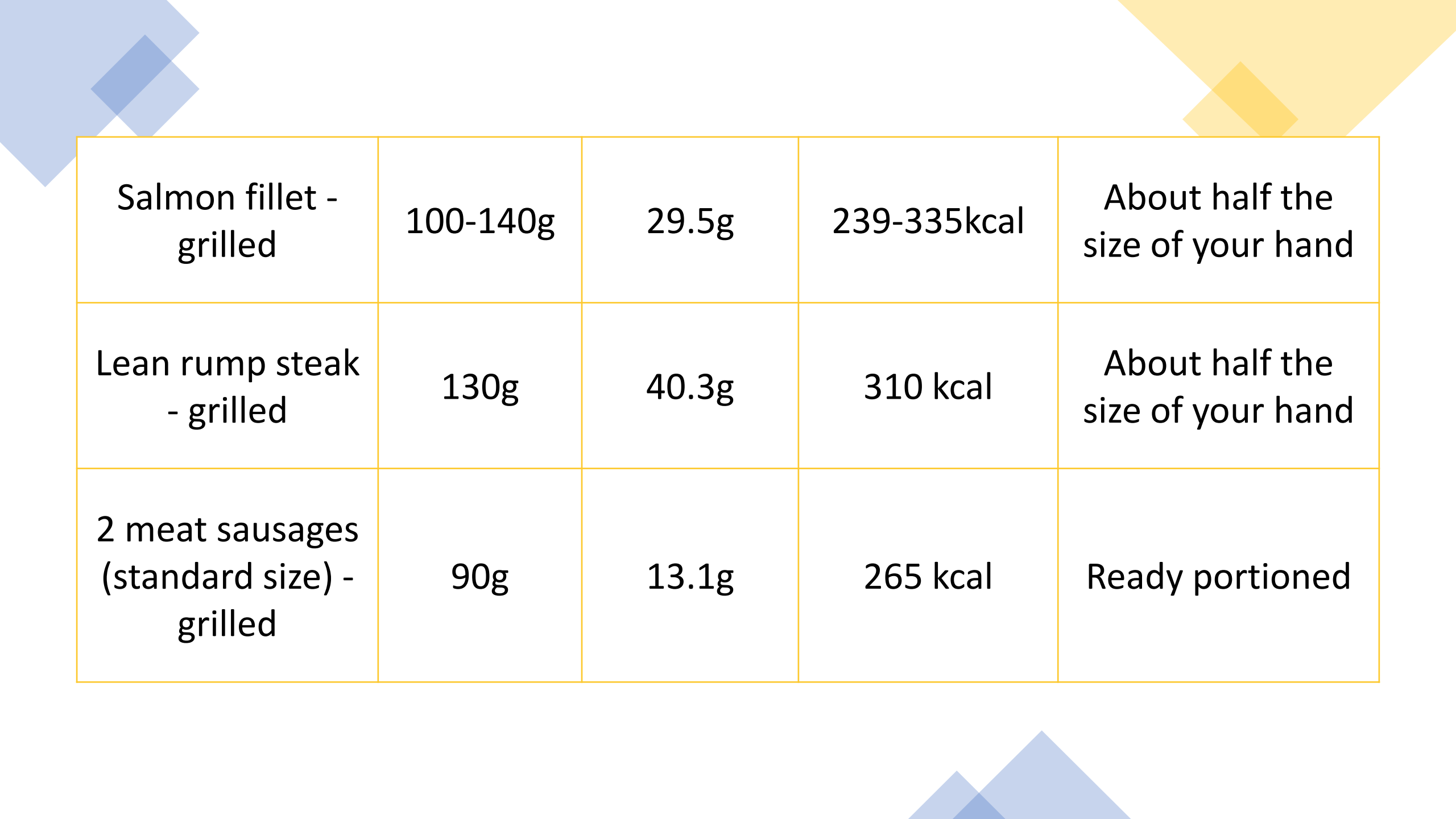
Animal Source	Food Type	Protein Content (g) per 100g
Meat	Chicken breast (grilled, without skin)	32.0
	Pork chop (lean, grilled)	31.6
	Beef steak (lean, grilled)	31.0
	Lamb chop (lean, grilled)	29.2
Fish	Tuna (canned in brine)	24.9
	Salmon (grilled)	24.6
	Cod (baked)	23.9
	Mackerel (grilled)	20.3
Seafood	Crab (canned in brine)	18.1
	Mussels (cooked)	17.7
	Prawns (cooked)	15.4
Eggs	Chicken egg (whole, boiled)	14.1
Dairy	Whole milk	3.4
	Semi-skimmed milk	3.5
	Skimmed milk	3.5
	Cheddar cheese	25.4
	Reduced-fat cheddar	27.9
	Cottage cheese	9.4
	Plain Greek-style yogurt	5.7
	Plain low-fat yogurt	4.8

Plant based	Food type	Protein content (g) per 100g
Pulses	Red lentils (boiled)	7.6
	Chickpeas (canned)	7.2
Beans	Tofu (steamed)	8.1
	Kidney beans (canned)	6.9
	Baked beans	5.0
Grains	Wheat flour (brown)	12.2
	Rice (easy cook, boiled)	10.9
	Bread (brown)	7.9
	Bread (white)	7.9
	Pasta (dried cooked)	4.8
	Porridge oats	3.0
Nuts	Almonds	21.1
	Walnuts	14.7
	Hazelnuts	14.1

Food	Portion size	Protein (g)	Calories	How to measure
Lentils, beans and other pulses	120g	~10g ¹	120-140kcal	About 6 tablespoons
Baked beans	200g	10g	162kcal	Half a standard 400g can
2 vegetarian sausages	80g	11.9g	114-154kcal	Ready portioned
Soya mince	100g	19.4g	100-103kcal	Use pack size as a guide
Quorn™ mince	100g	13g	92kcal	Use pack size as a guide

Unsalted nuts and seeds	20g	~4.1g ²	113-137kcal	About the amount that fits in your palm
Peanut butter	20g	4.6g	121kcal	About 1 tablespoon
Reduced fat houmous	50g	3.4g	104kcal	Ready portioned

Food	Portion size	Protein (g)	Calories	How to measure
Chicken breast - grilled	120g	38.4g	178 kcal	About half the size of your hand
2 eggs	80g	11.3g	172kcal	Ready portioned
3 fish - fingers	90g	12.9g	164kcal	Ready portioned



Salmon fillet - grilled	100-140g	29.5g	239-335kcal	About half the size of your hand
Lean rump steak - grilled	130g	40.3g	310 kcal	About half the size of your hand
2 meat sausages (standard size) - grilled	90g	13.1g	265 kcal	Ready portioned

Canned tuna	60g	15.2g	65 kcal	Half a medium can about 160g net weight)
Prawns	80g	12.3g	54kcal	About 4 tablespoons
2 slices of ham	30g	5.5g	32 kcal	Ready portioned

Protein Powders/Drinks

Advantages

- Some suitable for vegetarian, vegan, gluten free, halal
- Can be added to smoothies/soups, desserts
- Low in sugar, if sensitive to dumping syndrome
- Aids hydration
- Readily available in chemists, supermarkets, health stores
- Sample packs available

Disadvantages

- Low in calorie (powders only)
- Large volume
- Some contain other allergens e.g. wheat, egg, nuts, peanuts, milk
- Some do not contain vitamins and minerals
- Can be expensive



Protein Powder Examples

Phd Diet Whey Protein Powder

- Per 25g serving (1 scoop) 91kcal and 17g protein add to 175mls ice cold water
- 2 scoops add to 350ml
- Not nutritionally complete (no vitamins and minerals)

PE Nutrition (Whey Protein)

- Per 30g serving 98kcal and 20.5g protein add to 200ml water, juice, milk or yoghurt
- Product should be consumed within 20 minutes!!
- Not nutritionally complete (no vitamins and minerals)

NU26

- Per 2 x 50g serving 397kcal and 36g protein add to 500mls water or milk
- 1/3 of daily 26 essential vitamins and minerals



Complete Meal Drinks

- Huel
 - 500ml bottle contains 400kcal and 22g protein
 - 26 vitamins and minerals
 - Vegan protein powder – hemp, faba and pea protein

- Y Food
 - 500mls bottle contains 500kcal and 33g protein
 - 26 vitamins and minerals
 - From Whey and Casein



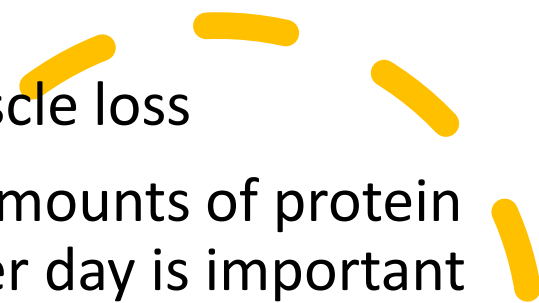
Whey v's Casein Protein

- Major proteins found in milk and dairy products
- Both protein can help muscle growth
- Casein can make you feel fuller for longer recommended as bedtime drink – watch for reflux!
 - Mixes easier with milk
- Whey is absorbed faster usually taken after exercise
 - Mixes easier with water
 - Typically more expensive than Casein
 - Higher content of leucine required for muscle protein synthesis
- Both can cause bloating, diarrhoea and stomach pain – if sensitive to dairy





In Summary

- Many factors can cause muscle loss
 - Ensure you take adequate amounts of protein per meal/snack, the total per day is important
 - Protein requirements based on government recommendations depending on age/activity and disease state
 - Exercise and eating protein helps muscle building
 - Protein shakes/meals can contribute to overall daily protein intake
 - Huge variety – do your research first!
- 

Good Luck!

Any Questions?

