

Topic 2: Fats

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Relevance of the topic: Fats are an essential part of school-aged children diet and is important for good health. There are different types of fats, with some fats being healthier than others. To help make sure school-aged children stay healthy, it is important to eat unsaturated fats in small amounts as part of a balanced diet.

Aim of the topic: Give information to you about fats, fatty acids, their functions in school-aged childrens body and the required amount of fat per a day.

Questions for prepare:

1. What is dietary fat?
2. Why is fat important?
3. How many different types of fats are there?
4. How much fat does school-aged children body need?
5. What foods are high in fat?

3.1 Role of Fats

Fats are organic molecules made up of carbon and hydrogen elements joined together in long chains called hydrocarbons. These molecules can be constructed in different ways, which creates different types of fat and their unique properties. The molecular configuration also determines whether fats will be healthy or unhealthy. Fat provides energy; 1 gram provides 37,6 kJ (9 kcal). Foods that contain a lot of fat provide a lot of energy. Fat is a carrier of fat-soluble vitamins and is necessary for their absorption.

Structure of fat

The building blocks of fat (lipid) are fatty acids and glycerol. Fatty acids found in foods and fats stored in the body are mainly present in the form of triacylglycerols (TAG, sometimes referred to as triglycerides); a glycerol molecule backbone to which three, often different, fatty acids are attached. Individual fatty acids can be present at any of three positions on the glycerol molecule (termed sn-1, sn-2 and sn-3). The presence of specific fatty acids at different positions on the glycerol molecule will also influence its characteristics (i.e. melting point and digestibility).

3.2 Main functions of fats

1. A source of energy: 1 gram provides 37,6 kJ (9 kcal). Foods that contain a lot of fat provide a lot of energy. Fat is a carrier of fat-soluble vitamins and is necessary for their absorption.
2. A source of essential fatty acids that our bodies cannot make
3. A component of cell walls
4. A way to absorb fat-soluble vitamins: A, D, E, and K
5. A way to insulate our bodies and protect organs
6. Fat is found in foods from both plants and animals.

3.3 Classification of fats

- **Saturated fat** is found in higher proportions in animal products and is usually solid at room temperature.

- **Unsaturated fat**

- **Monounsaturated** and **polyunsaturated fats** are found in higher proportions in plants and are usually liquid at room temperature.

- **Trans fat** is an unsaturated fat found primarily in partially hydrogenated oils (and foods containing these oils) and in small amounts in some animal products. Trans fat is structurally different from unsaturated fat that occurs naturally in plant foods and has detrimental health effects (Table 2).

Table 2. Main types of dietary fat: saturated, monounsaturated, and polyunsaturated

Saturated	Monounsaturated	Polyunsaturated	
		Omega-3	Omega-6
Animal fats Tropical oils (e.g. coconut, palm, cacao)	Olive oil Avocados Peanuts & groundnuts Tree nuts	Flax Fish oil	Most seed oils (e.g. canola, safflower, sunflower)

1. Saturated fats

Eating greater amounts of saturated fat is linked with an increased risk of heart disease and high blood cholesterol levels. These fats are usually solid at room temperature and are found in:

Animal-based products:

Dairy foods – such as butter, cream, full fat milk and cheese

- Meat – such as fatty cuts of beef, pork and lamb and chicken (especially chicken skin), processed meats like salami, Some plant-derived products:

- Palm oil
- Coconut
- Coconut milk and cream
- Cooking margarine

Many manufactured and packaged foods:

- Fatty snack foods (such as potato chips, savoury crackers)
- Deep fried and high fat take away foods (such as hot chips, pizza, hamburgers)
- Cakes and high fat muffins
- Pastries and pies (including quiche, tarts, sausage rolls, pasties, croissants)
- Sweet and savoury biscuits

2. Unsaturated fats

Unsaturated fats are an important part of a healthy diet. These fats help reduce the risk of heart disease and lower cholesterol levels (among other health benefits) when they replace saturated fats in the diet.

There are two main types of unsaturated fats:

Polyunsaturated fats:

- omega-3 fats which are found in fish, especially oily fish
- omega-6 fats which are found in some oils such as safflower and soybean oil, along with some nuts, including brazil nuts.

Monounsaturated fats:

- found in olive and canola oil, avocados and some nuts, such as cashews and almonds.

3. Trans fats

Trans fats are unsaturated fats that have been processed and as a result, behave like saturated fats. Eating trans fats increases the levels of ‘bad’ cholesterol and decreases the levels of ‘good’ cholesterol in the body which is a major risk factor for heart disease. It is important to lower the amounts of trans fats you eat to help you stay healthy.

Trans fats are found in many packaged foods and also in butter and some margarines. Use food labels to compare foods and choose those with fewer trans fats.

It is great for health to replace saturated and trans fats with mono and polyunsaturated fats.

Cholesterol

Cholesterol is a type of fat found in food, but also in our blood. Cholesterol has many important functions in the body but having high levels of the wrong type of cholesterol in the blood increases heart disease risk.

It was once thought that eating too many cholesterol-containing foods (such as eggs) was the major dietary cause of high blood cholesterol level. But we now know that eating too many foods containing higher amounts of saturated and trans fats is a bigger problem and has a much greater influence on blood cholesterol levels.

3.4 Requirements of fats

The dietary reference intake (DRI) for fat in school-aged children is 25-35% to 35% of total calories from fat. It is recommended to eat more of some types of fats because they provide health benefits. It is recommended to eat less of other types of fat due to the negative impact on health.

- Monounsaturated fat: 15% to 20%
- Polyunsaturated fat: 5% to 10%
- Saturated fat: less than 10%

- Transfat: 0%
- Cholesterol: less than 200 mg per day

References:

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