

A Sustainable Future

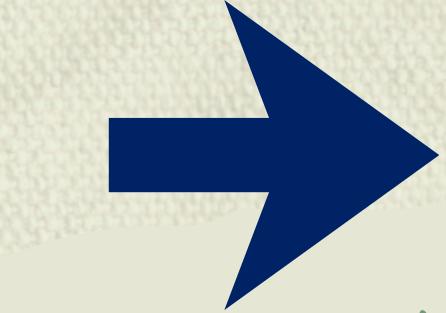
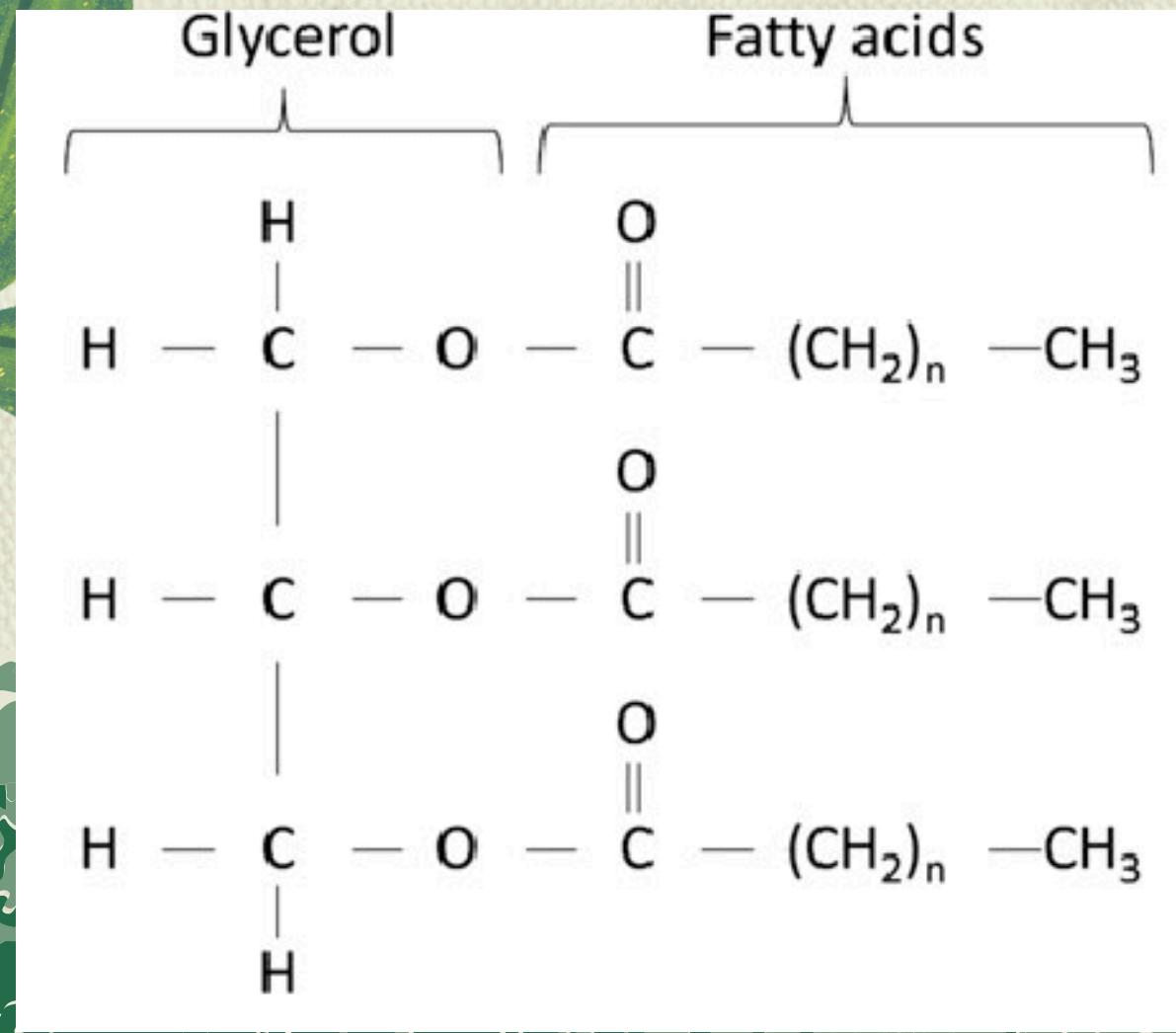


Non-Edible Product from UCO: Introduction to Used Cooking Oil

What is Used Cooking Oil (UCO)?

- UCO = used oil from frying/cooking process.
- Sources: homes, restaurants, food factory.
- Contains TAG & FFA.
- When oil is heated repeatedly, its colour changes, it becomes darker, more viscous, and develops burnt residue. This is caused by chemical reactions happening inside the oil due to exposure to heat, moisture from food, bits of food particles, and oxygen

Chemical Composition



- TAGs are molecules that consist of three fatty acids attached to a glycerol backbone. This structure is stable and ideal for cooking.
- However, once we heat the oil repeatedly, these TAG molecules start to break down.
- One of the major products of this breakdown is free fatty acids, or FFA. FFAs increase as the oil becomes older and more degraded

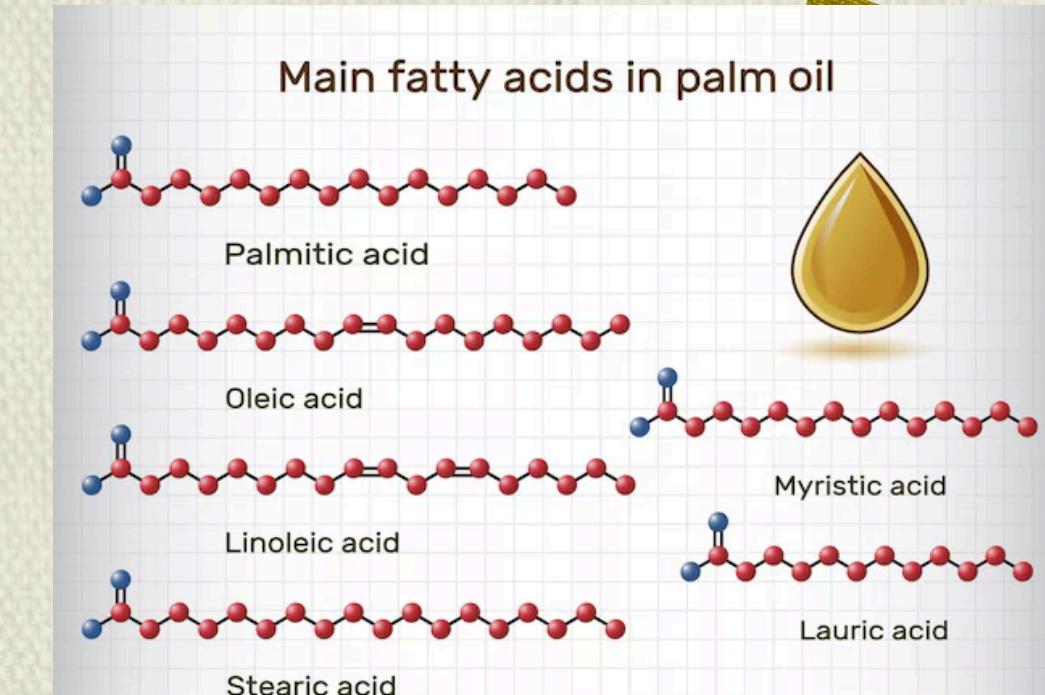


Degradation products:
PEROXIDES & ALDEHYDES

TAG & FFA Effects

When oil is used over and over again, several reactions take place.

- Firstly, OXIDATION where oxygen reacts with the oil molecules, causing them to degrade. This produces unpleasant smells and harmful compounds.
- Secondly, POLYMERIZATION, where long chains begin forming, making the oil thicker and stickier. This is why old cooking oil feels heavy and looks gummy.
- Thirdly, HYDROLYSIS, which increases the free fatty acids. Over time, the oil becomes darker, more viscous, and less suitable for cooking.



These chemical changes explain the physical changes we observe

- foaming
- darkening
- stickiness
- burnt smell.

Environmental Impact

FORM THIN LAYER ON WATER BODIES

- Oil form thin layers on water makes low oxygen in rivers. This layer blocks oxygen exchange, harming aquatic life such as fish, plants, and microorganisms. The oil can also trap debris, creating stagnant, smelly water.

FATBERGS FORMATION

- Many people pour UCO into the kitchen sink, but this leads to the formation of something called a fatberg
- Fatbergs are large, solid masses formed when fats, oils, and grease combine with other waste in sewer systems



Why Upcycle UCO *

In short, improper disposal not only damages drainage systems but also creates environmental and health hazards. This is why recycling UCO is a much better option.

- Reduce waste.
- Produce soap & candles.
- Support circular economy.



Towards a Waste-Free Future

Thank You