

SECTION 1 FACT CHECK PALM OIL

With a market share of 36%, palm oil is the most widely cultivated vegetable oil in the world, ahead of soybean oil. As a cheap fat component, palm oil is used in 50% of our food. Indonesia and Malaysia are the main palm oil producing countries, and large areas of virgin forest are cleared for palm oil plantations. Farmers' associations and environmental groups are sounding the alarm. Would switching to coconut oil be a sustainable alternative?

Fact-Check PALM OIL



The oil palm, a relative of the coconut palm, is the world's highest-yielding oil plant. It produces twice as much oil as the coconut palm.



The oil palm reaches a height of 30 m in tropical warm climates and on nutrient-rich soil. From the third year of life, the palms form fruits in the leaf axils. The orange-red, walnut-sized fruits grow densely packed in "clusters". A "cluster" consists of about 1,500 individual fruits and weighs about 50 kg. Each palm produces an average of 12-18 fruiting clusters per year. Oil palms can live for 100 years, but in plantations they are only cultivated for about 25 years and then replaced by younger, more productive trees.



For harvesting, they are cut off the palms with sickles or bush knives. As with the coconut palm, the fruits are drupes. A fatty and fibrous pulp surrounds the stone or kernel, consisting of a stone shell and one or two seeds inside. During the main harvest season, palms are harvested every 14 days and give 80% of their total yield. Environmental groups and regional farmers' associations complain about the clearing of virgin forests. In addition to the necessary fertilizers, insecticides and fungicides must be used in the monocultures to

curb the palms' increased susceptibility to plant pests.

For harvesting, they are cut off the palms with sickles or bush knives. As in the case of the coconut palm, the palm oil is a major cause of the decline in biodiversity in tropical rainforests. Palm oil, but also coconut oil from huge plantations, is a major reason for the decline in biodiversity in tropical rainforests.

- To produce 1 liter of palm oil, one third less land is needed than for 1 liter of coconut oil.
- Two types of oil are produced from the palm fruit - the kernel oil and the red oil from the pulp.
- The water demand is very high with about 3700 L per m², it must be irrigated artificially.

TASKS:

A) Compare the tables in the DATA SHEET (SECTION 2) and also the INFO SHEET (SECTION 3). These values are derived from studies by the Water Footprint Network, the Öko-Institut and Statista. Further sources are the works of the authors Mekonnen & Hoekstra (2010) and Poore & Nemecek (2018).

B) Gather more information about the oil palm crop to complete Tasks 1-5.

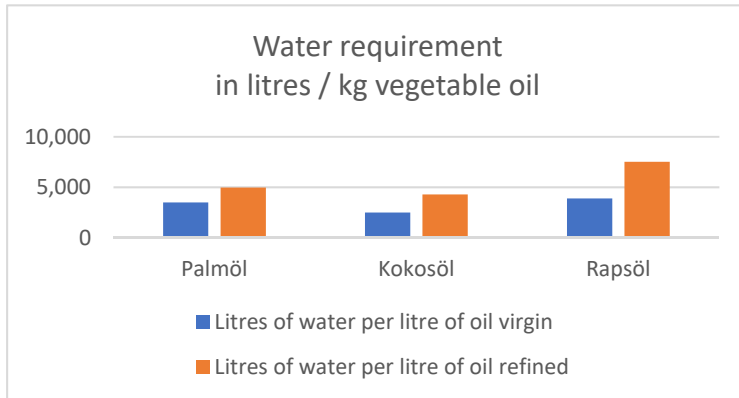
1. In which countries are oil palms grown? What is the production volume in tons?
2. Who exports palm oil to where? Describes the world trade.
3. Describes the growing conditions. Are fertilisers and/or plant protection products used?
4. How is palm oil made from the oil palm fruits? Outline the technical process.
5. Finds foods and industrial fluids that contain palm oil.



SECTION 2 DATA SET (data from 2019 on water use, CO₂ footprint and land use).

Water consumption for the production of 1 litre virgin vegetable oil

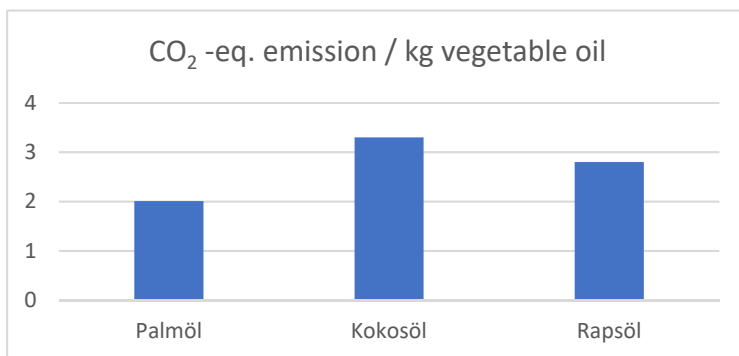
The oil plants thrive only in tropical humid climate. To obtain 1 litre of freshly pressed vegetable oil (in virgin quality), between 2,500 - 4,000 litres of water (blue, green & grey) are required. If the oil is refined, i.e. neutralised, bleached and deodorised, the water requirement increases considerably. However, domestic rapeseed is also very thirsty and is only intended here as an orientation to the cultivation conditions in a temperate climate.



Water-Footprint	Litre Water per Litre Oil	Litre Water per Litre Oil
	virgin	refined
Palm Oil	3,500	4,970
Coconut Oil	2,500	4,300
Rapeseed Oil	3,900	7,530

CO₂ - for the production of 1 litre virgin vegetable oil (2019)

By comparison, the production of 1 litre of cow's milk releases 3.2 kg of CO₂ eq.

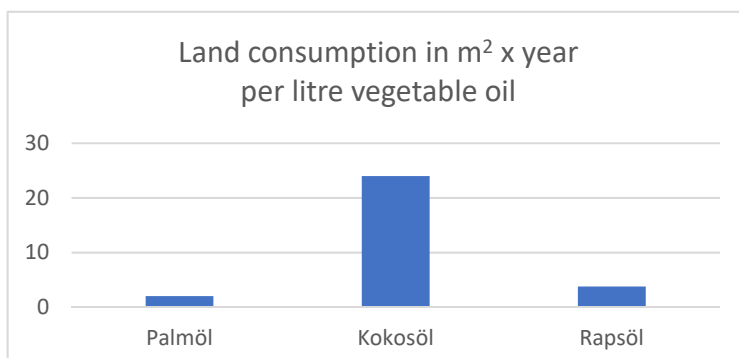


CO ₂ -Footprint	kg CO ₂ -Eq. / kg Plant Oil*
Palm Oil	2.01
Coconut Oil	3.3
Rapeseed Oil	2.8

* under the simplifying assumption that density is 1!! 1 Litre of Plant oil weight 1 kg

Land consumption in m² and year for the production of 1 litre virgin vegetable oil

Compared to the coconut palm, the oil palm's land consumption is considerably lower due to its 3 times higher yield per m²



Land Consumption	m ² x year per Litre
Palm Oil	2.05
Coconut Oil	24
Rapeseed Oil	3.8

TASK: Create an overview chart for the 3 products and discuss their life cycle assessments. The reference value should be one litre of vegetable oil.

SECTION 3 INFORMATION (production, ingredients and use)

CULTIVATION & PRODUCTION

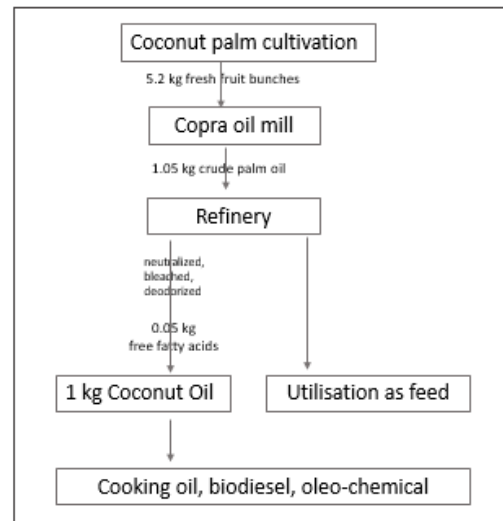
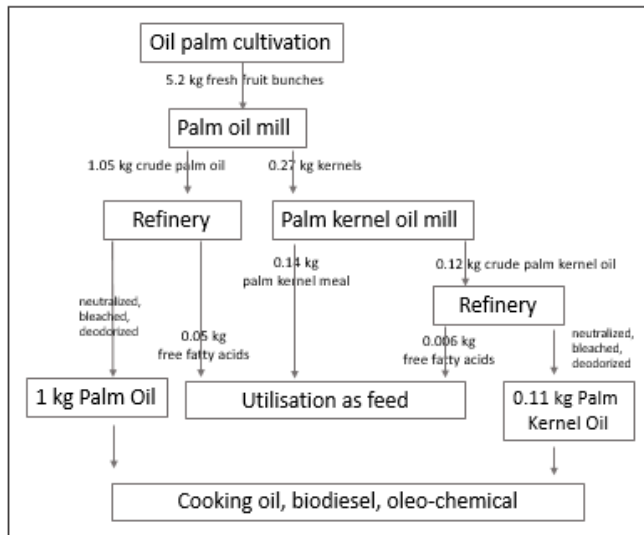
The two palm species are common in all tropical regions of the world. The world production of palm oil increased over 38% from 2010 to 2019. In 2019, 74.6 million tons of palm oil were produced worldwide. The **main oil palm growing countries** are Indonesia and Malaysia, together accounting for 84.1% of world production (approximately 63 million tonnes of palm oil in 2019). The cultivated areas in both countries have increased six-fold since 1990. Other producing countries such as Thailand (4.1%), Colombia (2.0%) and Nigeria (1.6%) hardly play a role.

The main **coconut palm growing countries** are Indonesia, India and the Philippines. The main producers for the oil are the Philippines (approximately 1.2 million tons of coconut oil in 2019) and Indonesia (0.9 million tons) followed by India, Vietnam and Mexico.

<https://de.statista.com/statistik/daten/studie/1176478/umfrage/ernteertrag-von-palmoelfrucht-nach-laendern/>

Production 2019	Palm Oil	Coconut Oil
	in tons	
Colombia	1527549	
India		351600
Indonesia	42869429	895000
Malaysia	1985367	
Mexico		130400
Nigeria	1220000	
Philippines		1193800
Thailand	3040000	
Vietnam		179014

The flow charts represent the steps in the extraction of palm oil and coconut oil.



CONTENTS

Both oils contain mainly saturated fatty acids. Especially the lauric acid is said to have positive properties.

Ingredients Content of fatty acids	Palm Oil	Coconut Oil	Rapeseed Oil
	in %		
Σ saturated fatty acids	49	96	83
Σ unsaturated fatty acids	39	2	15
Σ multiple unsaturated fatty acids	11	2	2

USE

Palm oil is mainly used for the production of biodiesel. In the cosmetics, detergent and food industries, many products would be inconceivable without palm and coconut oil. Due to their structure and consistency, they can be used in many ways. They can be found, for example, in chocolate (Nutella!), margarine, baked goods, instant soups and ice cream. For frying and baking, the natural red palm oil and coconut oil are very suitable.



SECTION 4 TABLE OF FACTS (for the group discussion and the expert panel)

While coconut oil is currently being treated as a true miracle cure, palm oil is more likely to make negative headlines. The deforestation of rainforests on a grand scale, huge monocultures and an associated decline in biodiversity seem to be the inevitable consequence of the cultivation of the oil palm. The ingredients are usually left out of the palm oil discussion. Coconut oil, on the other hand, which for a long time was regarded as an inferior fat due to its high content of saturated fatty acids, now belongs to the superfood category for some. The reason for this is the lauric acid it contains, to which many good properties are attributed.

We want to bring some light into the darkness and present the two vegetable oils from the fruits of the oil and coconut palms.

Overview of arguments pro / contra palm oil and coconut oil as an alternative	
PALM OIL	
Environmental reasons	
Land consumption	
Water consumption	
CO ₂ emissions	
other	
Health	
Fatty acid content	
World population, hunger	
Economic reasons	
Social reasons	

Other arguments:

The industry uses only the highly processed, i.e. refined, deodorized and bleached variant. The production of palm oil has fallen into disrepute because of the associated deforestation of rainforests, especially in Indonesia, which is now the world's largest producer of palm oil.

Producers of organic palm oil stand for sustainable cultivation of oil palms: primary or secondary forest must not be cleared, and the preservation of soil fertility is a central concern.

Our tip: If you want to use palm oil, be critical and inform yourself about the origin.