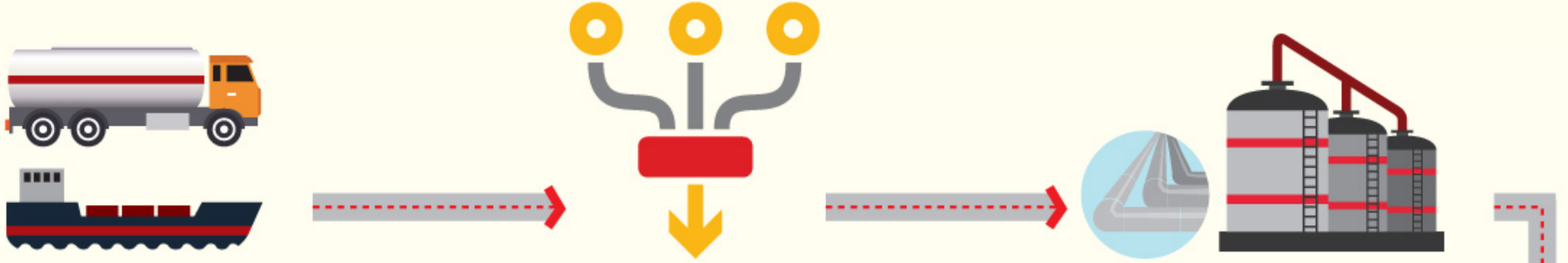


# Palm Oil Refining Process



CPO is transported from the mills to our refineries via trucks or ships

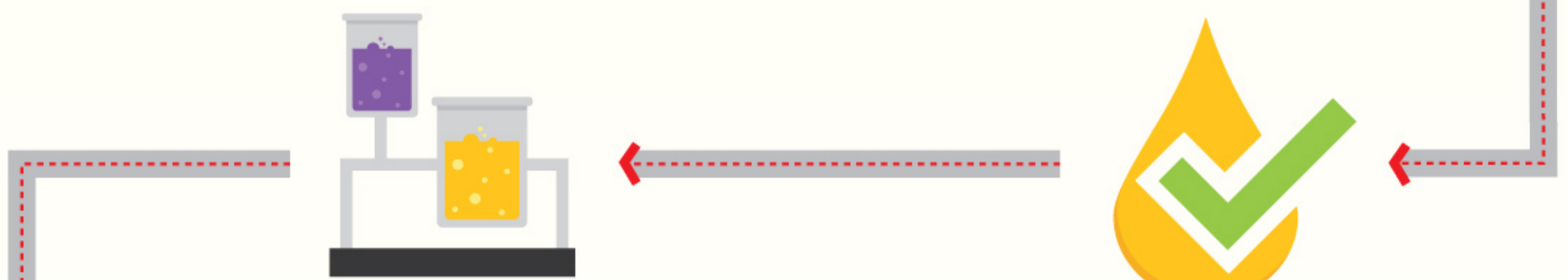
The CPO is further separated into tanks based on its quality.

The quality of the CPO is checked based on three parameters

- Free fatty acids (FFA)
- Moisture & Impurities
- Deterioration of Bleachability Index (DOBI)

It is also important to note that the quality of the CPO determines how the oil will eventually be used (whether for food or biodiesel)

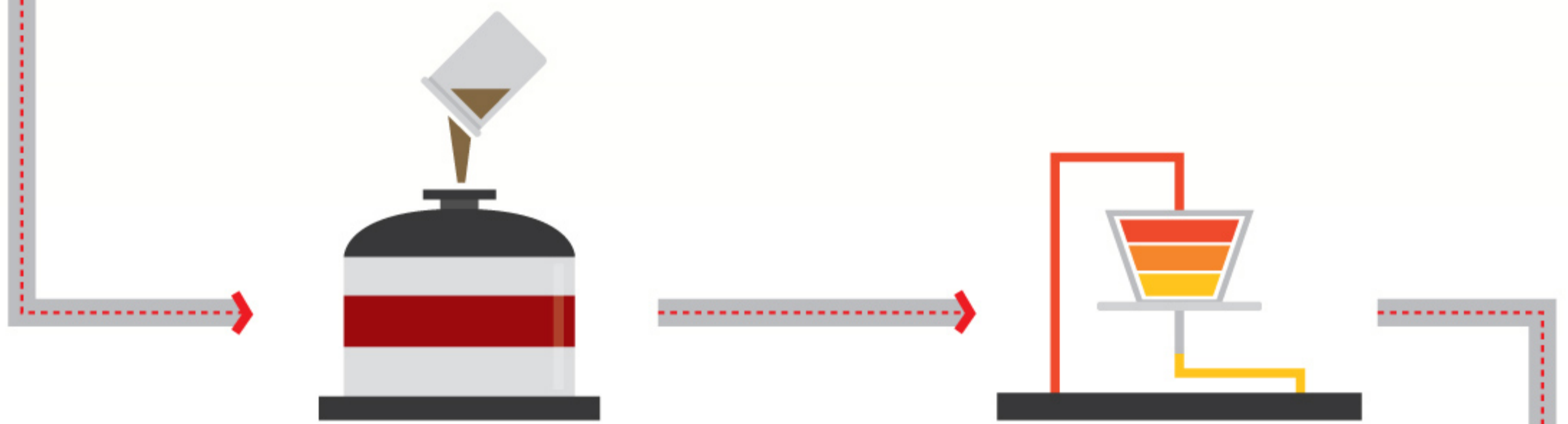
We pump the CPO from the trucks and ships using pipelines into storage tanks at the refinery



## Quality Check

### Degumming

The CPO is heated under vacuum, and phosphoric acid is added to separate the gums, which are impurities that will be removed in the bleaching stages

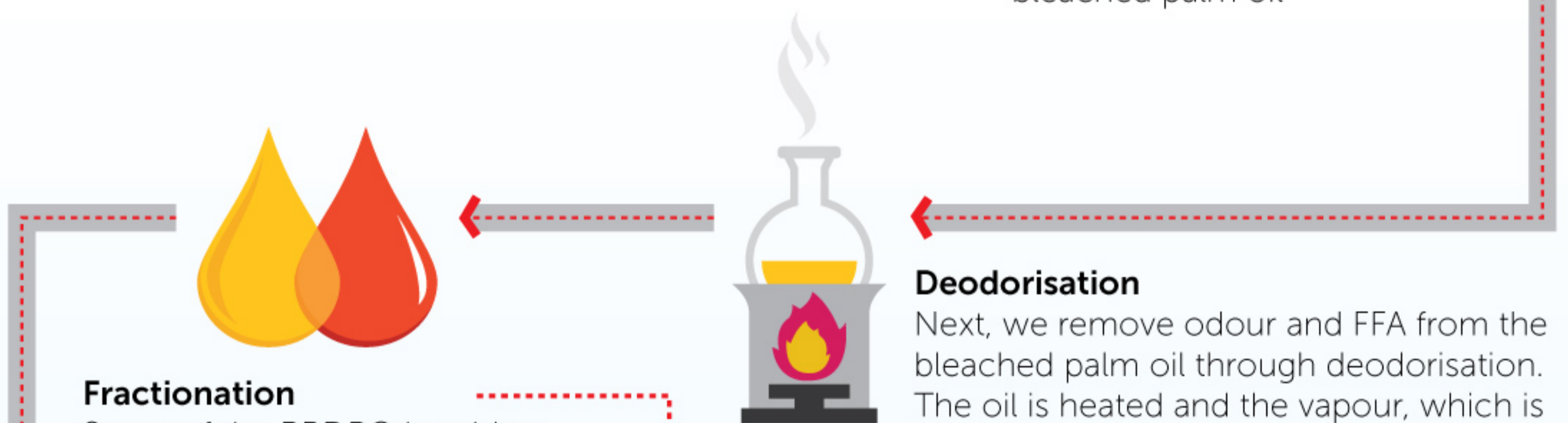


### Bleaching

We then add bleaching earth (activated clay) to adsorb all colour pigments in the oil

### Filtration

The oil is sent for filtration to remove the bleaching earth. At this point, we will have bleached palm oil



### Fractionation

Some of the RBDPO is sold to customers who use it as industrial frying fat. The bulk of it now undergoes fractionation where the oil is gradually cooled and passed through membrane filters

- A portion of it will crystallise upon cooling and become solid. This is known as palm stearin and is sold as margarine, shortening or as oleochemical feedstock
- Another portion stays as liquid, and this is known as palm olein, which is cooking oil

### Deodorisation

Next, we remove odour and FFA from the bleached palm oil through deodorisation. The oil is heated and the vapour, which is also known as palm fatty acid distillate (PFAD), is removed from the oil. The oil is now known as Refined Bleached Deodorised Palm Oil (RBDPO)

PFAD by-product can be used for biodiesel/oleochemical production



### Packaging

Margarine, shortening, and cooking oil are packaged in boxes, pouches, jerry cans and in bulk

We classify cooking oil based on their "cloud point". Olein with a low cloud point is used for consumer products like Filma. Olein with a higher cloud point is used for commercial purposes