

# Fats and oil



## Acceptance Guidelines for Raw Materials in a Feed Factory



## Palm oil

### General description

The oil extracted from the pulp of palm fruits (*Elaeis guineensis* Jacq. or *Elaeis melanococca* auct.). Crude palm oil is the most commonly used oil for feed production. In the industrial process, crude palm oil can be refined, bleached, and deodorized to obtain RBD palm oil.

**Other names:** red palm oil

### General aspect

Crude palm oil is dark red in colour, and liquid at room temperature. It has a very strong taste and a smell like overripe mushrooms. Refined, bleached, and deodorized (RBD) palm oil is bland, odourless, light yellow in colour, and semisolid at room temperature.

### Observation

Quality control of palm oil is essential to ensure the safety and purity of the product. Key parameters like homogeneity of the product, colour, smell, free fatty acid content, iodine value, or moisture, must be monitored to assess freshness and rancidity. The naturally reddish colour of crude palm oil is attributed to its high  $\beta$ -carotene content, distinguishing it from palm kernel oil. However crude palm oil will lose its carotene content after undergoing the refining process into RBD palm oil. Palm oil is a rich source of vitamin E that provides natural stability against oxidative deterioration. To store a representative sample for complementary analysis.

### General controls and acceptance requirements

Parameter to analyse	When	Type of analysis	Values		
			Normal	Reclaims	Decline
Humidity (%)	Before Unloading	Basic	<0.5		>1
Smell			Pungent		
Impurity			<0.15%		>0.5%
Peroxides (meq/kg)			<5		>14
Oleic acidity			<2%		>3%
Palmitic acid (%)	After Unloading	Extended	43%	<41%	<39%
NEM <sup>1</sup>			<7%		>10%

<sup>1</sup>Non-elutable material



## Soybean oil

### General description

The oil extracted from soybean seeds (*Glycine max*).

### General aspect

The colour of soybean oil is a typical yellow colour, liquid a room temperature.

### Observation

*Quality control of soybean oil is essential to ensure the safety and purity of the product. Soybean oil used by the feed industry is crude and contains gums very rich in choline, phospholipids, antioxidants, and vitamin E, which improves storage stability of the oil. Key parameters like homogeneity between batches, colour, smell, and free fatty acid content must be monitored to assess freshness and rancidity. To avoid corrosion of the equipment, moisture content is an important parameter to check during reception. Quality control of the impurities in soybean oil is necessary to prevent oxidative reactions, as well as to prevent blocked filters and injectors in the feed factory. The inclusion of soybean oil in the feed can improve pelleting process, but high levels of inclusion can be unfavourable for the durability of the granule.*

### General controls and acceptance requirements

Parameter to analyse	When	Type of analyse	Values		
			Normal	Reclaims	Decline
Humidity (%)	Before Unloading	Basic	<0.5		>1
Impurity			<0.15%		>0.5%
Hum + Impurity (%)			<1		>2
Peroxides (meq/kg)			<5		>14
Oleic acidity			<2%		>3%
Linoleic acid (%)	After Unloading	Extended	52%	<50%	<46%
NEM <sup>1</sup>			<7%		>10%

<sup>1</sup>Non-elutable material



# Soybean acid oil

## General description

The by-product of the soybean oil refining industry.

**Other names:** Soapstock, acidulated soapstock.

## General aspect

The colour of soybean acid oil is dark brown and it is liquid a room temperature, with a typical pungent odour.

## Observation

*Due to the number of parameters to be evaluated, it is necessary to apply strict quality control measures to avoid potential undesirable mixture with other oils, and products with process deficiencies should be rejected at delivery. Generally, batches with light colour are associated with better quality product than batches with dark colour. During the chemical refining process, triglycerides are separated from the free fatty acids, which are responsible for the acidity, by adding NaOH. Due to the high value in free fatty acids, stabilization with an antioxidant is essential. Soybean acid oil can cause corrosion issues in metallic equipment in the feed factory. The homogeneity of the product is an important quality control to check at reception. It is recommended to take at least 3 samples during unloading of the lot: at the beginning, the middle, and at the end of the truck unloading. To store a representative sample for complementary analysis.*

## General controls and acceptance requirements

Parameter to analyse	When	Type of analysis	Values		
			Normal	Reclaims	Decline
Humidity (%)	Before Unloading	Basic	<0.8		>1.2
Impurity			<1%		>2%
Hum + Impurity (%)			<2		>4
Peroxides (meq/kg)			<5		>14
Oleic acidity	After Unloading	Extended	56	>70	
Linoleic acid (%)			54	<50	<46%
NEM <sup>1</sup>			<15%		>20%

<sup>1</sup>Non-elutable material