

Plant proteins



Acceptance Guidelines for Raw Materials in a Feed Factory



Coconut meal

General description

The by-product of the oil extraction from dried coconut kernels (copra)

Other names: Copra meal, copra cake, coconut meal, coconut cake, expeller copra meal, expeller copra cake.

General aspect

Good quality coconut meal is described as white to pale yellow meal, well dried and clean. It should be free from rancid or undesirable odours, impurities, molds, insects, and other contaminants.

Observation

During the reception, analysis of the moisture content of the coconut meal is essential to avoid aflatoxin contamination. Products that exhibit high moisture content or smoky, burnt, moldy, or rubbery flavor or odour should be rejected. Rising temperature in the meal may indicate microbial growth and/or insect infestation. The high oil content of copra meal renders it susceptible to rancidity and the product should not be used after prolonged storage. Coconut meal should be kept in a well-ventilated store.

General controls and acceptance requirements

| Parameter to analyse | When | Parameter to analyse | Values | | |
|-------------------------------|------------------|----------------------|----------------------|----------|---------------------|
| | | | Normal | Reclaims | Decline |
| Humidity (%) | Before Unloading | Basic | <8 | | >13 |
| Insects | | | Absence | | Presence |
| Agglom. particles | | | Absence | | Presence |
| Colour | | | White to pale yellow | | Brown to dark brown |
| Smell | | | | | Rancid |
| Temperature ¹ (°C) | | | | | >10 |
| Impurity (% , max) | | | 0.25 | | 1 |
| Aflatoxin levels (ppm, max) | | | 5 | | 20 |
| Oil ² | | | 3.5–7 | | |

¹respect environmental temperature.

²for defatted coconut meal and expeller cake, respectively.



Palm kernel meal

General description

A by-product of oil production derived from the extraction of palm fruit kernels.

Other names: p.k. cake, expeller p.k. meal, solvent-extracted p.k. meal.

General aspect

The colour of palm kernel is dark brown. Commercial product is sold as powder, well dried and clean, with a typical sweet flavour and odour like soap.

Observation

Due to the high variability in the oil extraction process of the palm kernel meal, an accurate control of the batches and suppliers is essential to categorize the product. Special attention must be given to monitoring the oil, fibre, humidity, and mycotoxin levels of the product.

General controls and acceptance requirements

| Parameter to analyse | When | Parameter to analyse | Values | | |
|-------------------------------|------------------|----------------------|---------|----------|----------|
| | | | Normal | Reclaims | Decline |
| Humidity (%) | Before Unloading | Basic | <12 | | >13 |
| Insects | | | Absence | | Presence |
| Agglom. particles | | | Absence | | Presence |
| Smell | | | | | Rancid |
| Temperature ¹ (°C) | | | | | >10 |
| Aflatoxin levels (ppm, max) | | | 5 | | 20 |
| Fiber (%) | | | 20 | | >26 |
| Protein + Fat (%) | | | >22 | | <20 |

¹respect environmental temperature.



Rapeseed meal

General description

The by-product of oil extraction from rapeseed (*Brassica napus* L., *Brassica rapa* L. and *Brassica juncea* L., and their crosses).

Other names: full-fat rapeseed, full-fat canola seed, rapeseed oil meal, canola meal, canola seed meal.

General aspect

The colour of rapeseed meal is yellowish brown and the commercial product is sold as powder or pellets. In both forms the product must be absent of rancid odours or agglomerated particles.

Observation

Temperature is one of the main factors affecting the quality of rapeseed meal. It is recommended to analyse the general presentation, smell, humidity, and check for overcooked particles at reception. Handling of rapeseed products is generally easy for the feed mill, except when batches contain excess moisture. 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 | <12 | | >14 |
| Insects | | | Absence | | Presence |
| Colour | | | Yellowish brown | | |
| Agglom. particles | | | Absence | | Presence |
| Smell | | | | | Rancid |
| Temperature ¹ (°C) | | | | | >10 |
| Protein (%) | | | 35 | | <33 |
| Fiber (%) | After Unloading | Extended | 12 | | >14 |
| Hexane (ppm) | | | | | >100 |
| Glucosinolates (ppm) | | | 20 | | >26 |

¹respect environmental temperature.



Soybean meal

General description

A by-product of oil production derived from the extraction of soybean seeds., with partial reintroduction of part of the hulls.

Other names: soyabean meal, soybean cake, soybean oil meal, soybean oil cake.

General aspect

The colour of soybeans meal should be light beige, but it can vary from yellow to dark brown, depending on the level of heat treatment applied. The product must be absent of any rancid smell and agglomerated particles.

Observation

During reception, attention must be given to the temperature and colour of the product. Warm batches that exhibit dark-coloured grain may have been overcooked during heat treatment. To avoid possible contamination, pay attention to the bulk density of the batches. Due to the product's high agglomerate capacity, vaults may form in the silo. Also, the fat content of soybean meal means that oxidation may also be a risk during storage. Consequently, long storage times are not recommended. 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 | <12 | >13 | >14 |
| Insects | | | Absence | | Presence |
| Colour | | | Light beig | | Yellow and dark brown |
| Overcooked part. | | | Absence | | Presence |
| Agglom. particles | | | Absence | | Presence |
| Smell | | | | | Rancid |
| Temperature ¹ (°C) | | | | | >10 |
| Protein (%) | | | Depending on the contract | 0.5 point < contract | |
| Ash (%) | After Unloading | Extended | <7 | >7 | |
| Hexane (ppm) | | | | | >100 |
| Urease activity (pH increase) | | | >0.3 | | >0.5 |
| KOH solubility (%CP) | | | 70-80% | | |

¹respect environmental temperature.



Peas

General description

The seed of pea (*Pisum sativum* L.).

Other names: Pea, field pea, feed pea, protein pea.

General aspect

The colour of pea grain varies from yellowish green, to green, yellow, or pale green, brown or mottled. Hulled peas can be thin or thick, smooth, or wrinkled, and the seed of pea can vary in shape and size.

Observation

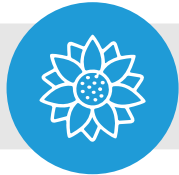
In the feed factory, handling and storage of peas is very easy. The variability of peas chemical composition is relatively low. The main nutritional variation occurs in the levels of trypsin inhibitor and tannins, which are lower in the spring varieties as compared to winter varieties. It is occasionally possible to observe damage to the grain due to parasite infection (bore grain). The inclusion of the peas in the feed improves pellet quality. 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 | 11 | | >14 |
| Damage grain (%) | | | <5 | | >7 |
| Insects | | | Absence | | Presence |
| Temperature ¹ (°C) | | | | | >10 |
| Protein (%) | | | 18–24 ² | <18 | |
| Tannins (%) | After Unloading | Extended | <7 | >7 | |

¹respect environmental temperature.

²depends on the variety



Sunflower meal

General description

The by-product of oil manufacture from sunflower seeds (*Helianthus annuus* L.).

Other names: sunflower oil meal or cake, sunflower seed meal cake, expeller sunflower meal, dehulled sunflower meal or cake, decorticated sunflower meal or cake.

General aspect

The colour of sunflower meal varies from grey to black. Commercial product is sold as powder or pellets. In both cases, the product must be free from rancid, damp, or musty odours and not exhibit agglomerated particles.

Observation

In the feed factory, sunflower meal is easy to handle and to store. However, in powder form the product has a very low density and high silo capacity is required to store it. Pay attention to batches that exhibit high humidity and temperature because these conditions could result in spontaneous auto combustion within the silo. Long storage times are not recommended, as particle agglomeration can result in vaults within the silo. The colour of sunflower meal varies depending on the degree of dehulling and on the extraction process of the oil. Consequently, the extraction process of the oil determines the protein and fat contents of the sunflower meal. It is recommended to check for adulteration by contaminants. 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 | 12 | | >13 |
| Colour | | | Grey to black | | |
| Agglom. particles | | | Absence | | Presence |
| Temperature ¹ (°C) | | | | | >10 |
| Protein (%) | | | Depending on the contract | 1.5 point < contract | |
| Fibre (%) | After Unloading | Extended | 18-25 ² | | >27 |
| Hexane (ppm) | | | | | >100 |

¹respect environmental temperature.

²depends on the variety