

Hull in meal

- Hull in meal↑ → CF↑
- Nutrient digestibility↓

General properties of meal

- 90% DM
- 30-50% CP
 - 95% of nitrogen is true protein
 - Digestibility of protein, biological value ↑
- 9-20% CF
- 6-7% Crude ash
 - Ca↓
 - P, K and Mg ↑
- Metabolizable energy
 - 2000-2300 kcal/kg for poultry
 - 2200-2700 kcal/kg for ruminant

Meals used for animal nutrition

- Soyabean meal
- Sunflower seed meal
- Cottonseed meal
- Linseed meal
- Peanut meal
- Sesame meal
- Hazelnut meal
- Canola meal
- Poppy meal

Soyabean meal-I

- Biological value of soya protein ↑
- Soyabean meal
- 44-50% CP
 - lysine↑ methionine ↓
- CF 4-7%
- Total nutrient digestibility↑ 90%
- EE 1%
- CA 5-6%
 - Sufficient phosphorus (0.70%)
 - calcium (0.30%) ↓

Soyabean meal-II

- B group vitamins ↑
- A, C and D vitamins ↓
- Metabolisable energy
 - 2550 kcal/kg for poultry
 - 2850 kcal/kg for ruminants
- If heating treatment is not sufficient
 - trypsin inhibitors, urease
- To determine urease enzyme activity in meal
 - Sufficient heat treatment

Soyabean meal-III

- High protein value
 - Used in young animals and poultry
 - Upto 40% for poultry diets
 - (methionine levels in diets)
- 2 kg/day for dairy cattle
- 1 kg/day for beef cattle
- 300 g/day for sheep
- 1 kg/day for horses

Sunflower seed meal

- Quality depends on hull content
- Seeds with hull
 - Nutritive value of meal ↓
- CP 22-42%
 - Lysine ↓
 - Biological value of protein ↑

Sunflower seed meal-II

- Meal is obtained from seeds after hull removal
 - CP 40-44%
 - Digestibility of organic matter above 80%
- Meal is obtained from seeds with hull
 - CP 22-25%
 - Digestibility of organic matter below 40%
- CF 14-28% (depending on hull content)
- Crude ash 6-7%
- EE in solvent extraction procedure 0.5-2%
 - Expeller procedure 4-7%
- ME
 - 1900 kcal/kg for poultry
 - 2300 kcal/kg for ruminants

Sunflower seed meal-IV

- Meal without hull
 - 15% for laying hens
 - 5% for broiler
- 2 kg/day for dairy cattle
- 1 kg/day for fattening cattle
- 250 g/day for sheep
- 30% for diets of dairy and beef cattle

Cottonseed meal

- CP 25-45%
 - Content of hull
 - Manufacturing method
 - Lysine, methionine, cystine, triptophane ↓
 - Biological value of protein ↓
- CF 10-20% (depending on hull)
- EE (depending on manufacturing technique)
 - solvent extraction 1-2%
 - expeller 4-7%