The Use of Sunflower Meal in Livestock Diets

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Sunflower Meal in Livestock Diets

Presentation Overview
- Oilseed meal production and consumption
- Nutrient composition of sunflower meal
- Comparison with other meals
- How it is used in livestock diets
- Summary
Estimated Annual Meal Production (Tonnes)

Canola  Soybean  Sunflower  Cottonseed

Ref: AOF, 2003
Oilseed Meal Consumption (‘000 tonnes)

Ref: AOF, 2003
Oilseed Meal Consumption (% of total)

Ref: AOF, 2003
Oilseed Meal Consumption by Species

- Pigs: 7%
- Poultry: 4%
- Dairy: 23%
- Feedlots: 66%

Ref: AOF, 2003
Oilseed Meal Production & Consumption

• Variable annual production due to weather etc.
• Consumption is increasing.
• Sunflower meal usage has declined to 5.5% of the total.
• Pig and poultry consume 90% of the oilseed meals.
# Nutrient Composition of Sunflower Meal

- Dependent on:—
  - Oil content of the seed
  - Extent of hull removal
  - Efficiency of oil extraction
  - Processing temperature

<table>
<thead>
<tr>
<th>% dry matter</th>
<th>No hulls removed</th>
<th>Partially dehulled</th>
<th>Dehulled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude protein</td>
<td>28.0</td>
<td>34.0</td>
<td>41.0</td>
</tr>
<tr>
<td>Fat/oil</td>
<td>1.5</td>
<td>0.8</td>
<td>0.5</td>
</tr>
<tr>
<td>Crude Fibre</td>
<td>24.0</td>
<td>21.0</td>
<td>14.0</td>
</tr>
<tr>
<td>Ash</td>
<td>6.2</td>
<td>5.9</td>
<td>5.9</td>
</tr>
</tbody>
</table>

Ref: Hesley, 1994
## Nutrient Content of Whole Seed and Meals

<table>
<thead>
<tr>
<th>%</th>
<th>Seed</th>
<th>Meal</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Expeller</td>
<td>Extracted</td>
<td>Semi-d.</td>
<td>Decort.</td>
<td></td>
</tr>
<tr>
<td>Oil</td>
<td>34.5</td>
<td>15.4</td>
<td>2.1</td>
<td>2.6</td>
<td>2.7</td>
<td></td>
</tr>
<tr>
<td>Protein</td>
<td>16.2</td>
<td>24.5</td>
<td>31.1</td>
<td>35.8</td>
<td>41.3</td>
<td></td>
</tr>
<tr>
<td>DUP</td>
<td>2.9</td>
<td>4.0</td>
<td>4.4</td>
<td>6.4</td>
<td>7.4</td>
<td></td>
</tr>
<tr>
<td>Lys</td>
<td>0.57</td>
<td>0.86</td>
<td>1.10</td>
<td>1.26</td>
<td>1.46</td>
<td></td>
</tr>
<tr>
<td>Met</td>
<td>0.37</td>
<td>0.56</td>
<td>0.72</td>
<td>0.82</td>
<td>0.95</td>
<td></td>
</tr>
<tr>
<td>NDF</td>
<td>37.8</td>
<td>42.6</td>
<td>44.2</td>
<td>41.3</td>
<td>31.3</td>
<td></td>
</tr>
</tbody>
</table>
Fibre in Vegetable Protein Meals (Relative to soybean meal)

Crude fibre
Neutral detergent fibre

Ref: Ridley AgriProducts
Energy in Vegetable Protein Meals (Relative to soybean meal)

Ref: Ridley AgriProducts
Protein in Vegetable Protein Meals (Relative to soybean meal)

Ref: Ridley AgriProducts
Amino Acids in Vegetable Protein Meals (Relative to soybean meal)

Ref: Ridley AgriProducts
Amino Acids in Vegetable Protein Meals (Relative to soybean meal)

Ref: Ridley AgriProducts
Nutrient Composition of Sunflower Meal

• Hull content has a major effect
• Sunflower compared with other oilseed meals:
  – Higher in fibre
  – Lower in energy
  – Lower in protein
  – Lower in amino acids
## Sunflower Meal in Ruminant Diets

<table>
<thead>
<tr>
<th></th>
<th>Typical inclusion in supplementary feed (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calf</td>
<td>2.5</td>
</tr>
<tr>
<td>Dairy</td>
<td>20 – 25</td>
</tr>
<tr>
<td>Beef</td>
<td>20 – 25</td>
</tr>
<tr>
<td>Lamb</td>
<td>2.5</td>
</tr>
<tr>
<td>Ewe</td>
<td>15 - 20</td>
</tr>
</tbody>
</table>

Ref: Ridley AgriProducts
Sunflower Meal in Ruminant Diets

- **Growing heifers**
  - comparable with soybean meal
  - comparable with soybean meal or distillers' grains
- **Steers**
  - comparable with cottonseed meal
- **Beef cows**
  - comparable with canola or beans
- **Dairy cows**
  - comparable with other vegetable protein meals
  - feeding whole sunflowers increases the level of C18:0, C18:2 and C20:0 compared with control-fed cows
Sunflower Meal in Pig Diets

• Ideal ratios for amino acids for growing pigs are exceeded in all cases in sunflower meal

BUT

• It has a relatively low lysine level

LEADING TO

• Oversupply of other amino acids
• Inefficient feed utilisation
• Overcome by using synthetic lysine

OTHER ISSUE

• Not cost effective at current prices
Relative Costs of Lysine Sources ($/kg)

- **Soybean**
- **Canola**
- **Meat & Bone**
- **Sunflower**
- **Synthetic Lysine**

Legend:
- **Total lysine**
- **Available lysine**

Ref: Ridley AgriProducts
Sunflower Meal in Poultry Diets

• Maximum of 5% in layer diets
  – Egg staining, litter quality, odour
• Maximum of 7.5% in broiler and grower diets
  – High fibre level, lowered digestibility
• Can use slightly higher levels in pelleted feeds compared with meals/mash
  – Fibre is compacted by pelleting
  – Bulk in meal/mash can increase feed consumption
  – But higher fibre can reduce pellet quality
Sunflower Meal – Summary 1

- Changing nutrient composition by breeding needs to be accompanied by yield increase for maximum benefit
- GMO status has implications for its use in some markets
- Important issues for the animal feed industry
  - Variability in product
  - Variability in supply
Sunflower Meal – Summary 2

• A useful protein source for all classes of ruminant livestock
• Limitations in pig and poultry diets due to nutrient balance
• Use is determined by cost relative to other protein sources