

# The Use of Sunflower Meal in Livestock Diets

Tim Harrington, Neil Gannon,  
Alex Chang & Ray Johnson

Technical Services Division, Ridley AgriProducts, Australia

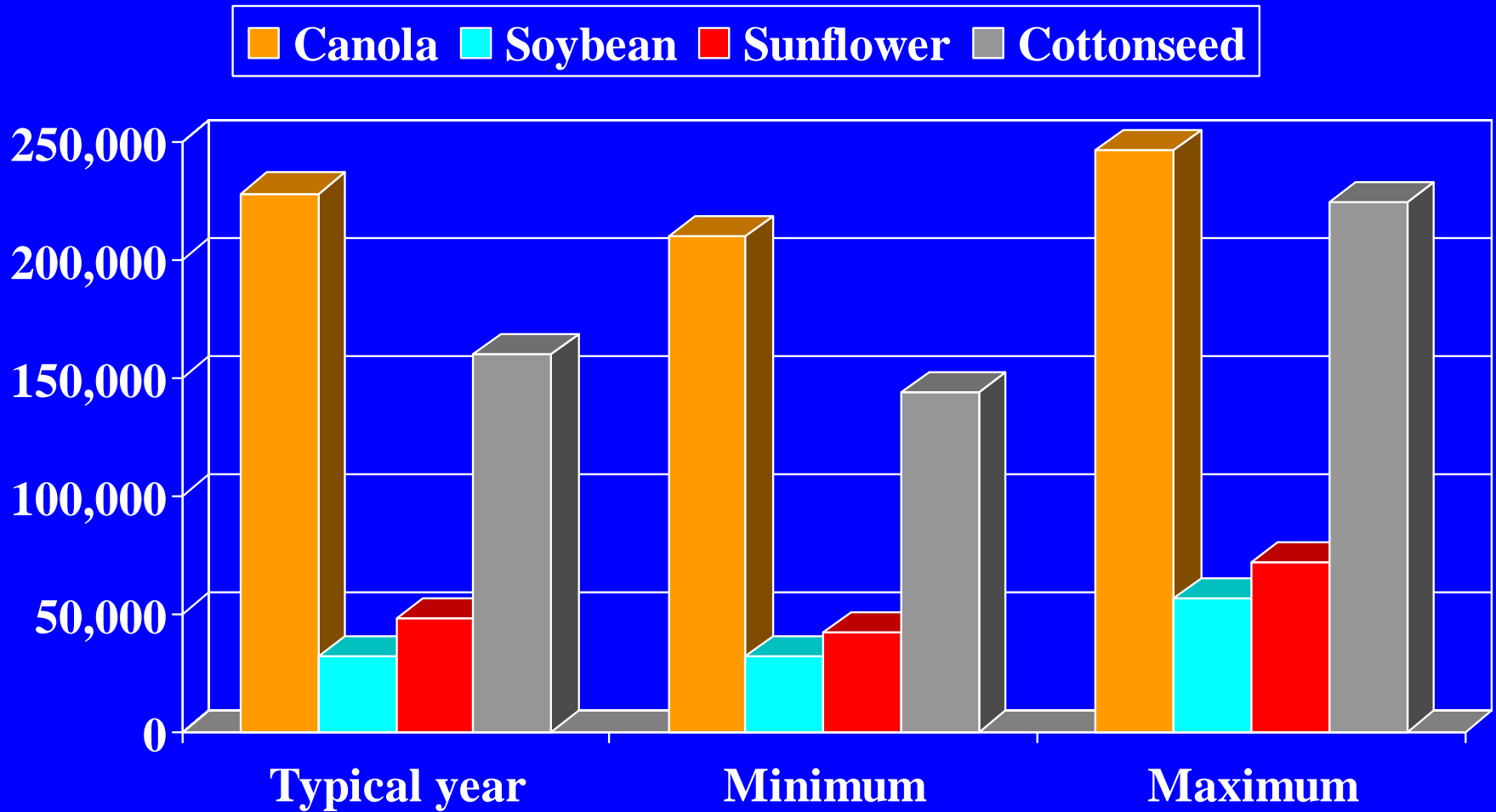


# Sunflower Meal in Livestock Diets

## Presentation Overview

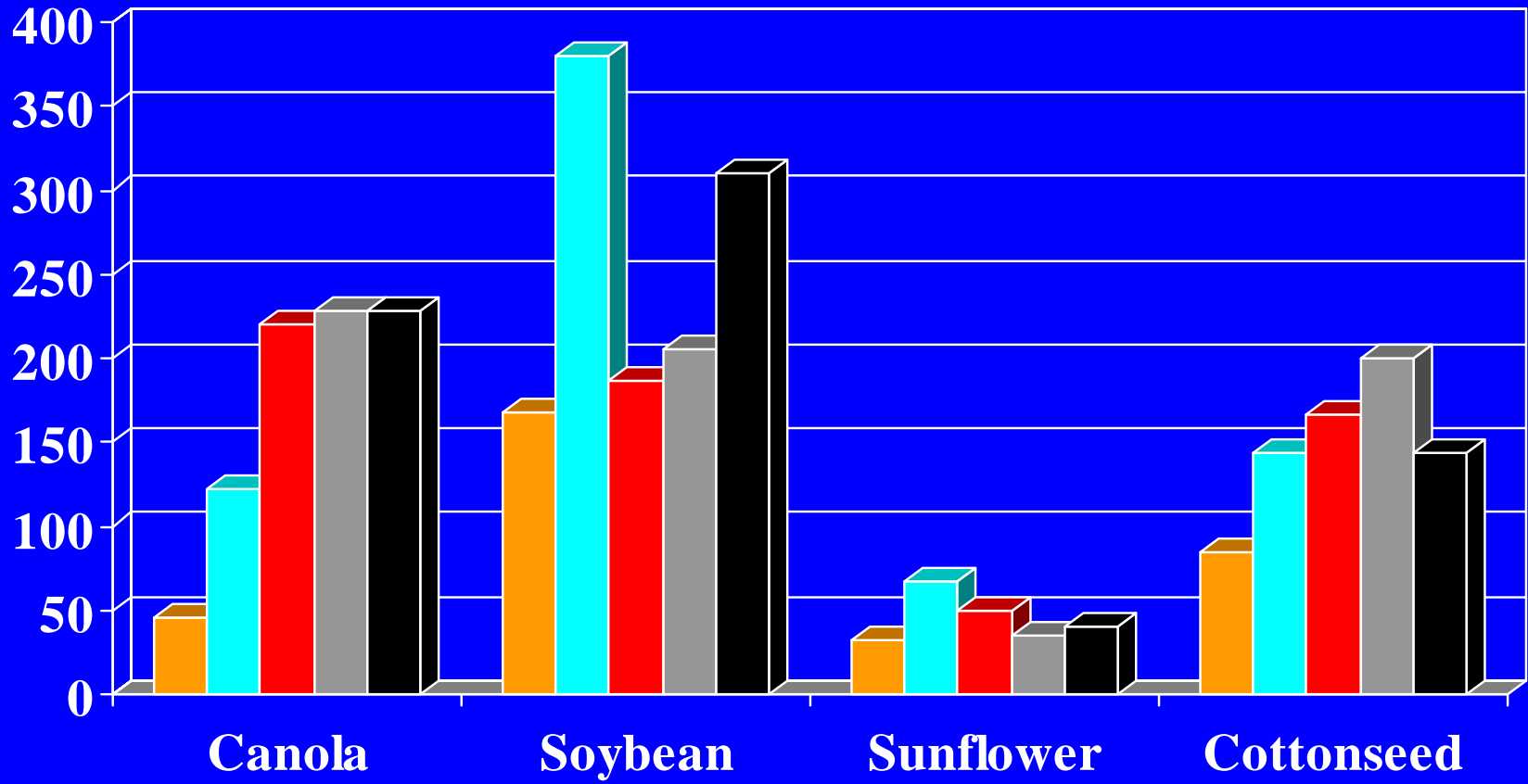
- Oilseed meal production and consumption
- Nutrient composition of sunflower meal
- Comparison with other meals
- How it is used in livestock diets
- Summary

# Estimated Annual Meal Production (Tonnes)



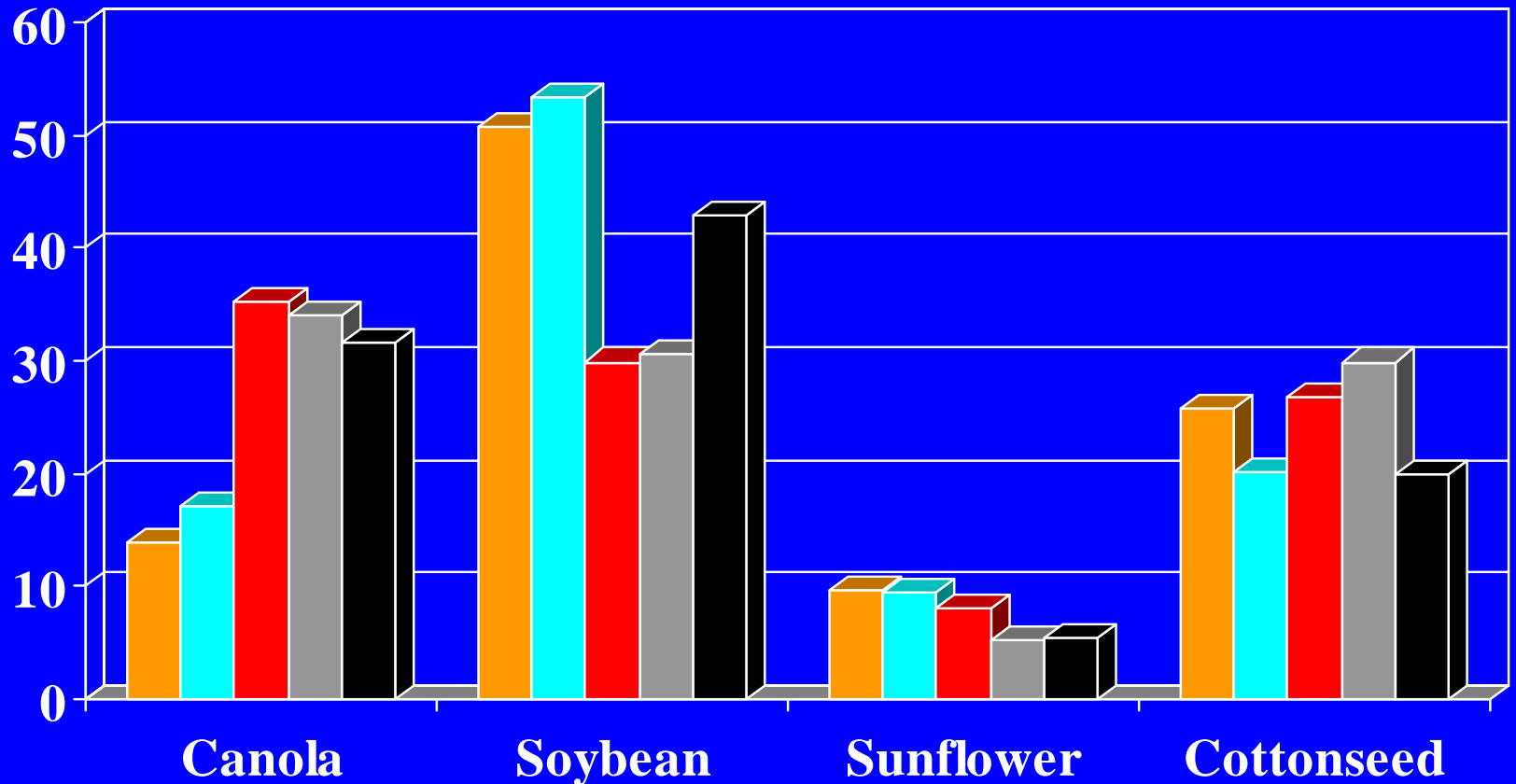
# Oilseed Meal Consumption ('000 tonnes)

89/90 94/95 99/00 00/01 01/02

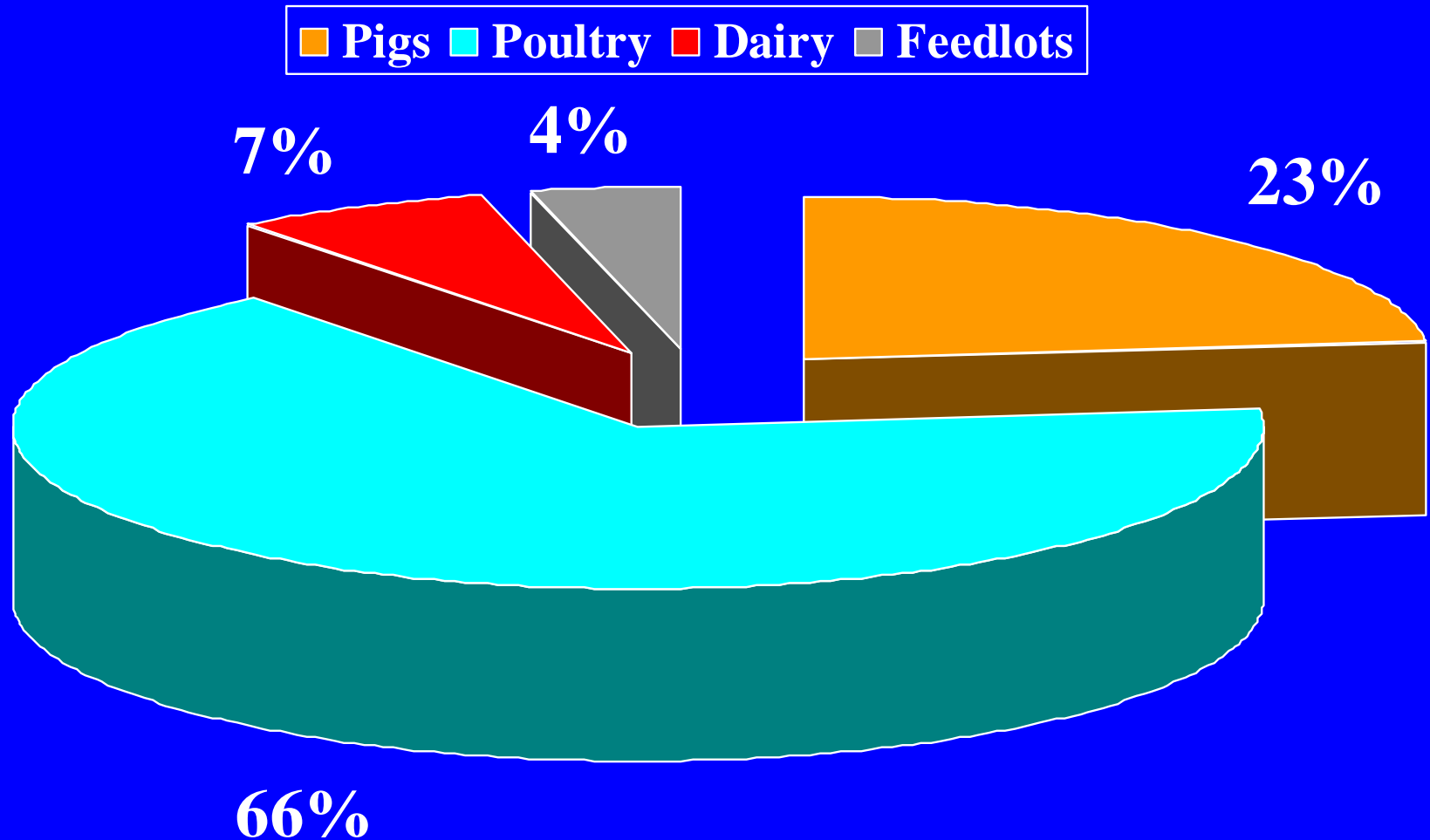


# Oilseed Meal Consumption (% of total)

89/90 94/95 99/00 00/01 01/02



# Oilseed Meal Consumption by Species



# 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

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

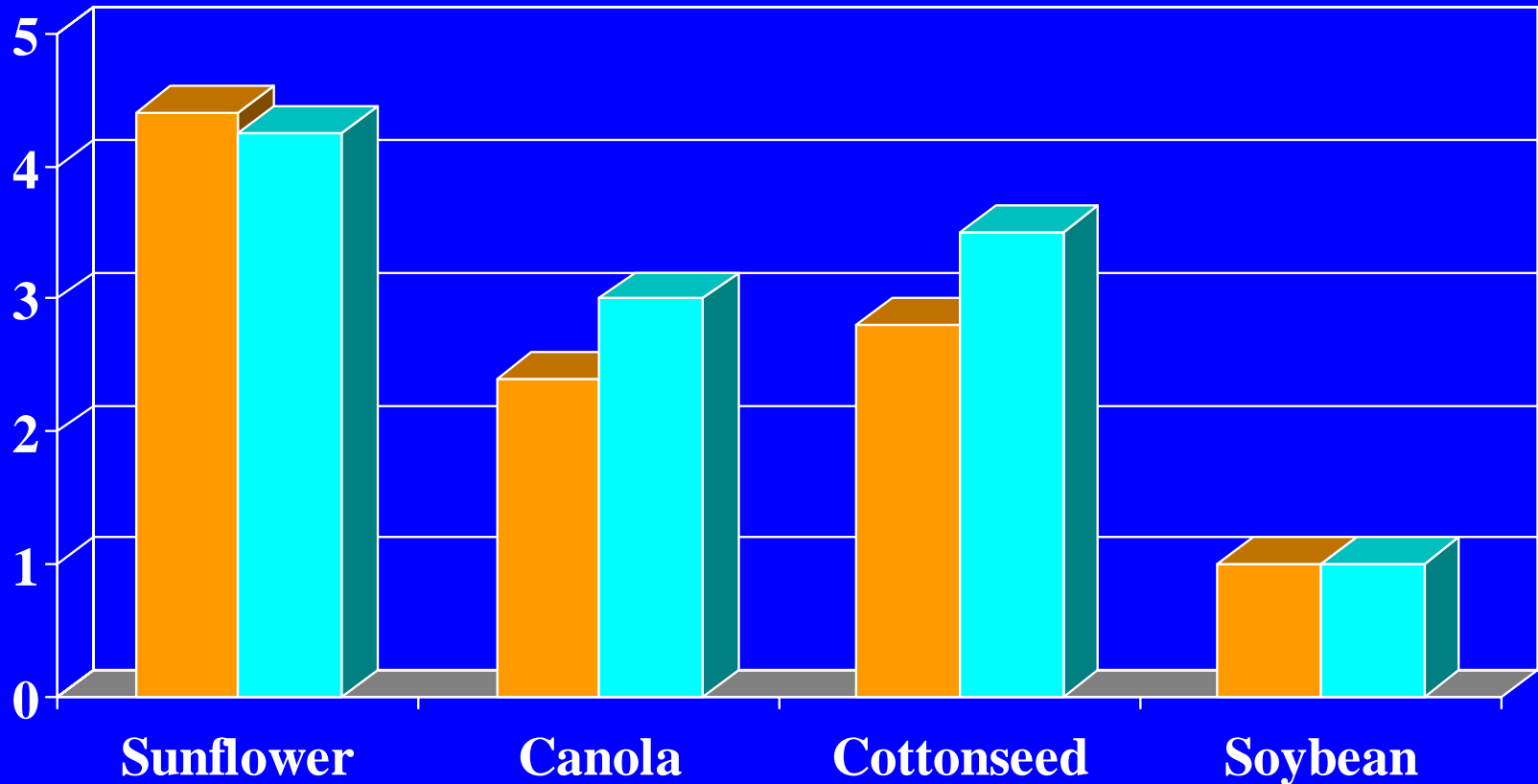


# Nutrient Content of Whole Seed and Meals

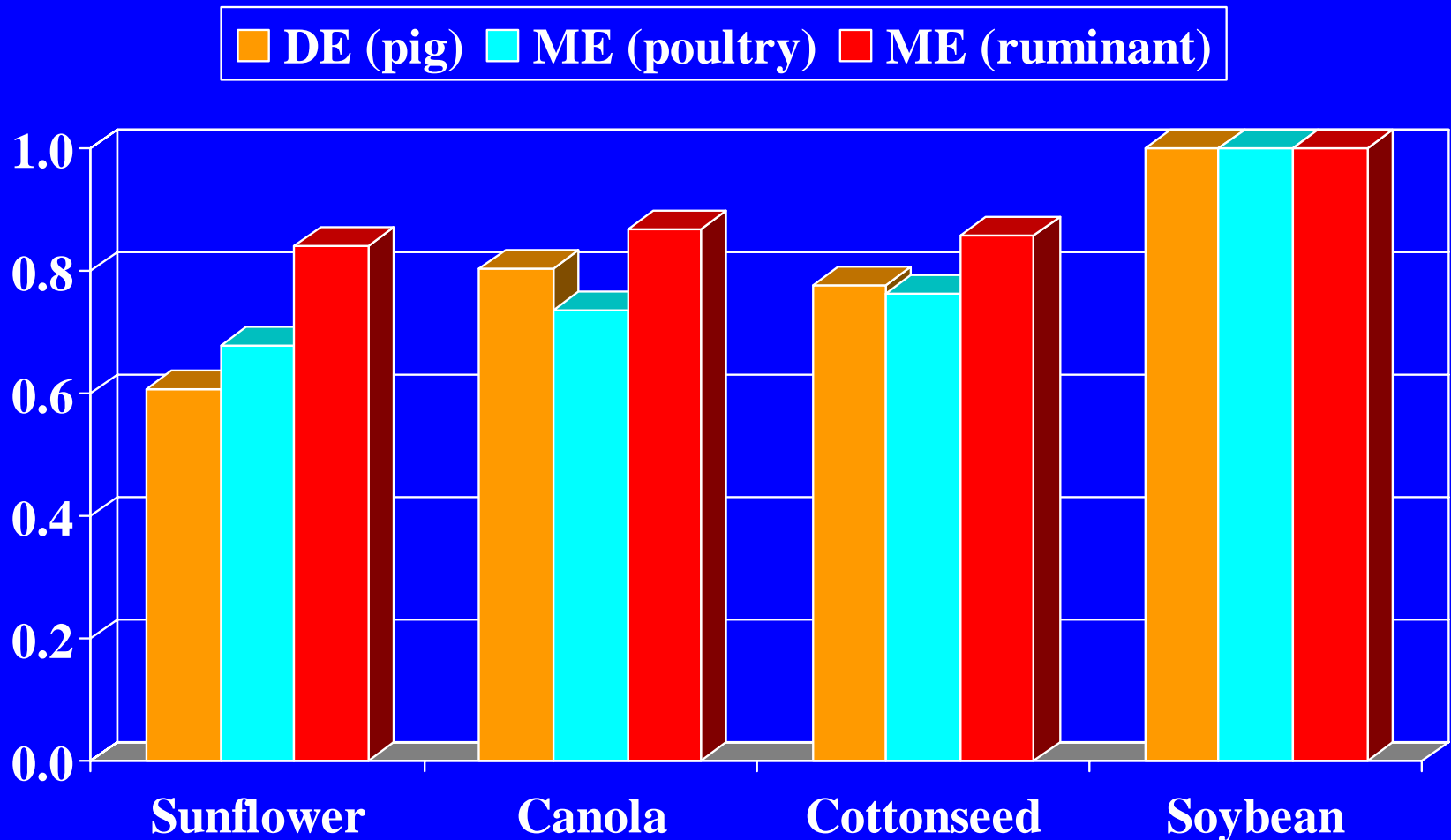
%	Seed	Meal			
		Expeller	Extracted	Semi-d.	Decort.
Oil	34.5	15.4	2.1	2.6	2.7
Protein	16.2	24.5	31.1	35.8	41.3
DUP	2.9	4.0	4.4	6.4	7.4
Lys	0.57	0.86	1.10	1.26	1.46
Met	0.37	0.56	0.72	0.82	0.95
NDF	37.8	42.6	44.2	41.3	31.3

# Fibre in Vegetable Protein Meals (Relative to soybean meal)

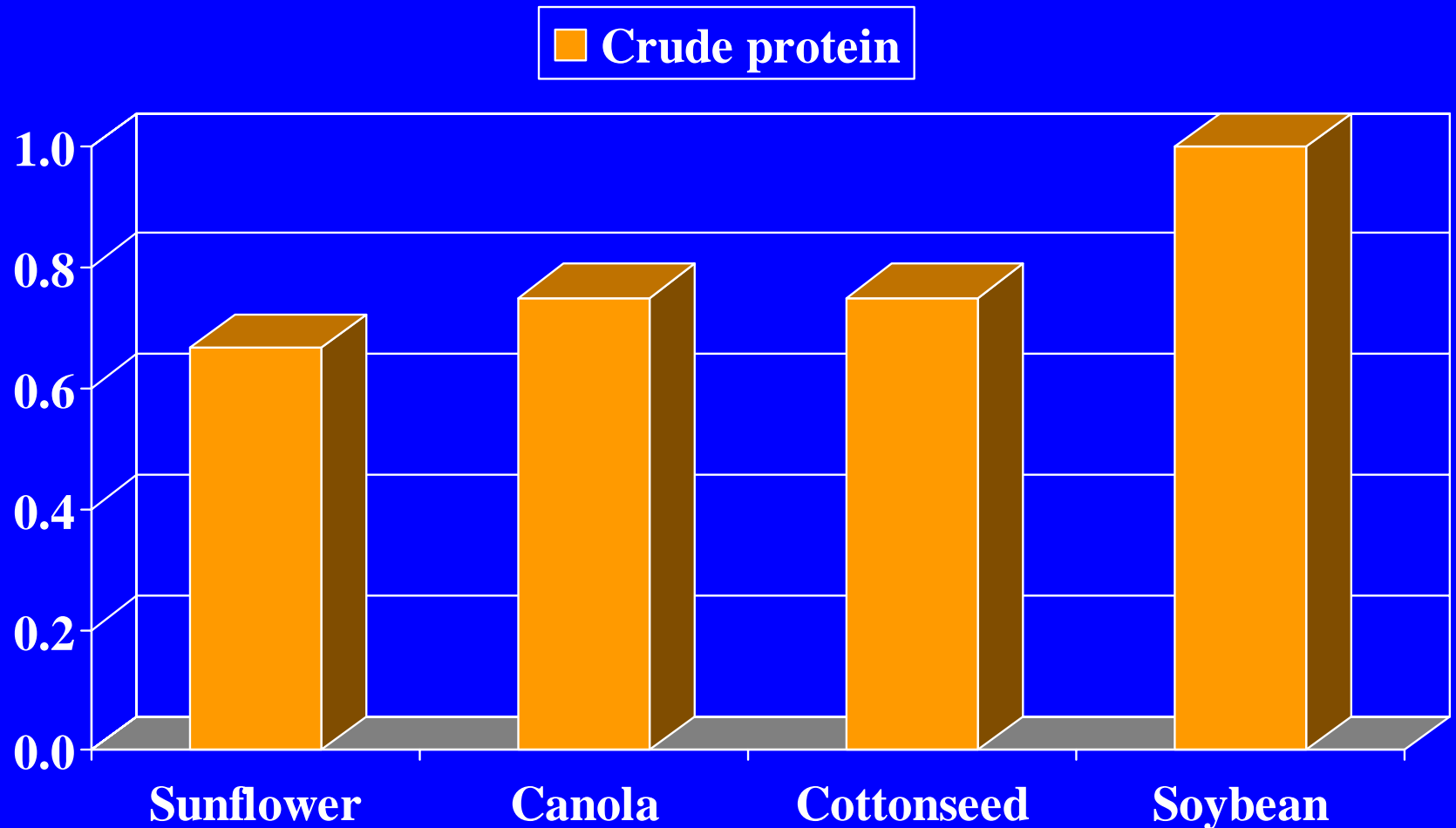
■ Crude fibre ■ Neutral detergent fibre



# Energy in Vegetable Protein Meals (Relative to soybean meal)

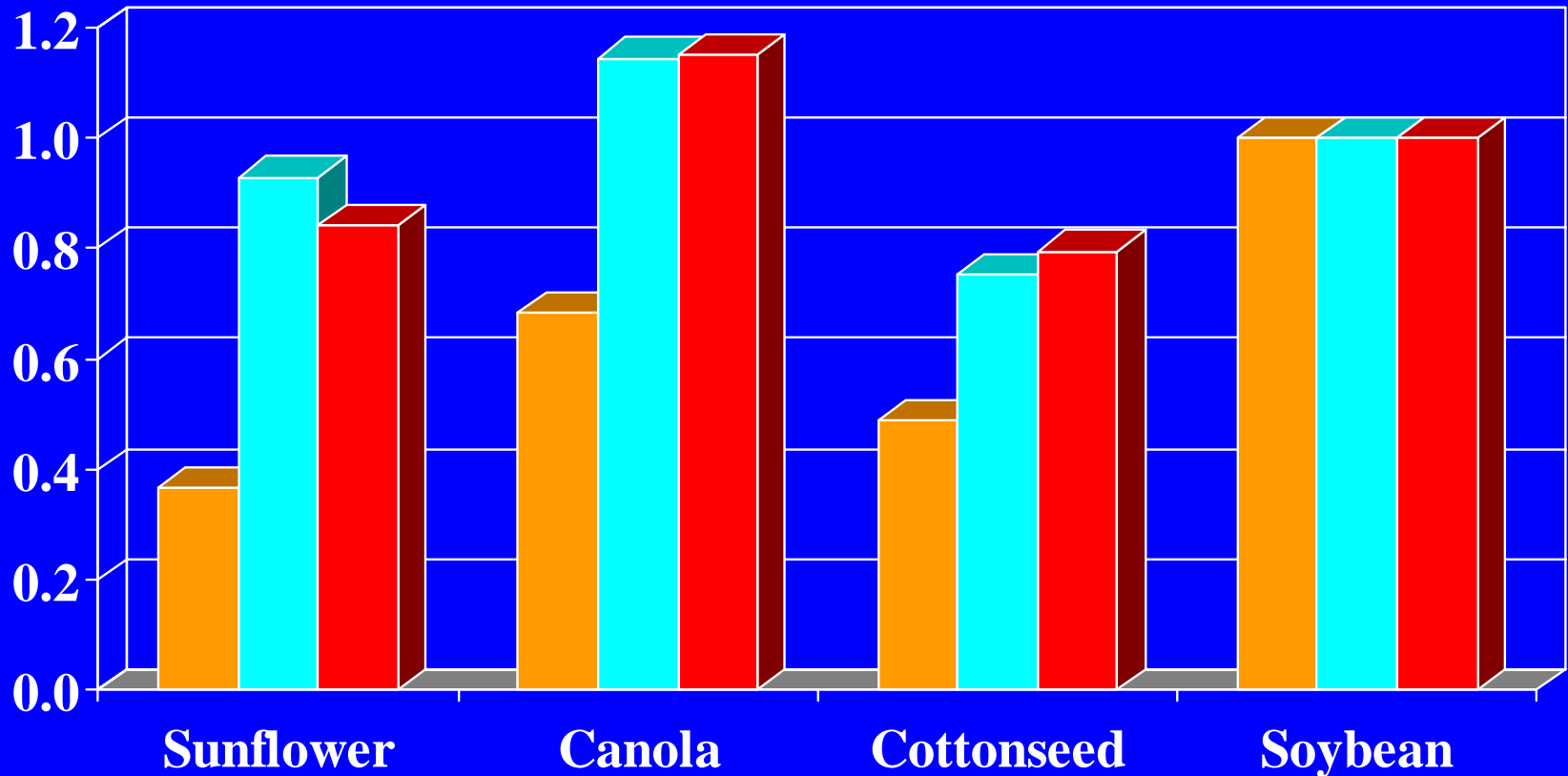


# Protein in Vegetable Protein Meals (Relative to soybean meal)



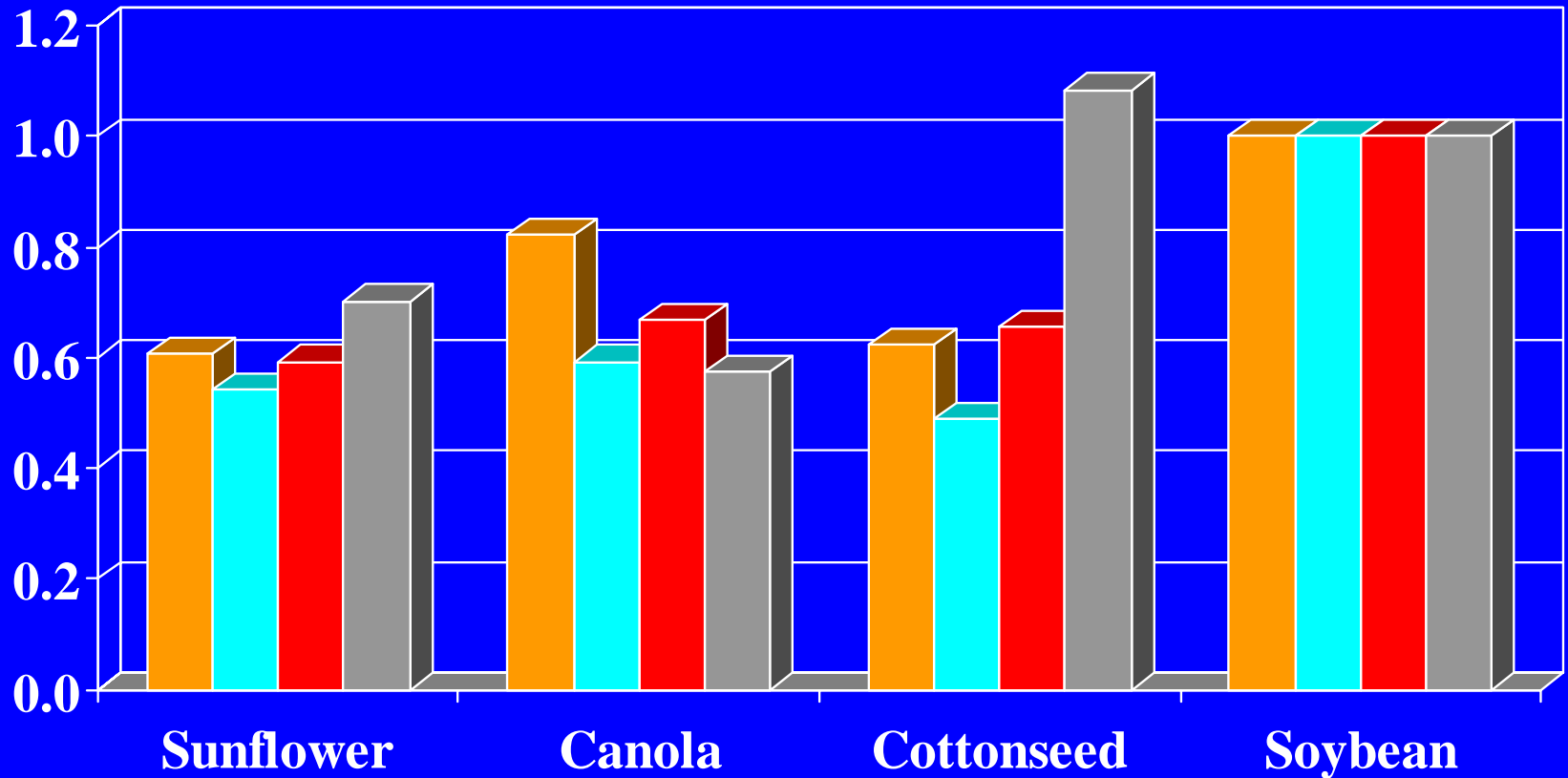
# Amino Acids in Vegetable Protein Meals (Relative to soybean meal)

■ Lysine ■ Methionine ■ Methionine + Cystine



# Amino Acids in Vegetable Protein Meals (Relative to soybean meal)

■ Threonine ■ Isoleucine ■ Tryptophan ■ Arginine



# 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

	Typical inclusion in supplementary feed (%)
<b>Calf</b>	<b>2.5</b>
<b>Dairy</b>	<b>20 – 25</b>
<b>Beef</b>	<b>20 – 25</b>
<b>Lamb</b>	<b>2.5</b>
<b>Ewe</b>	<b>15 - 20</b>



# 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

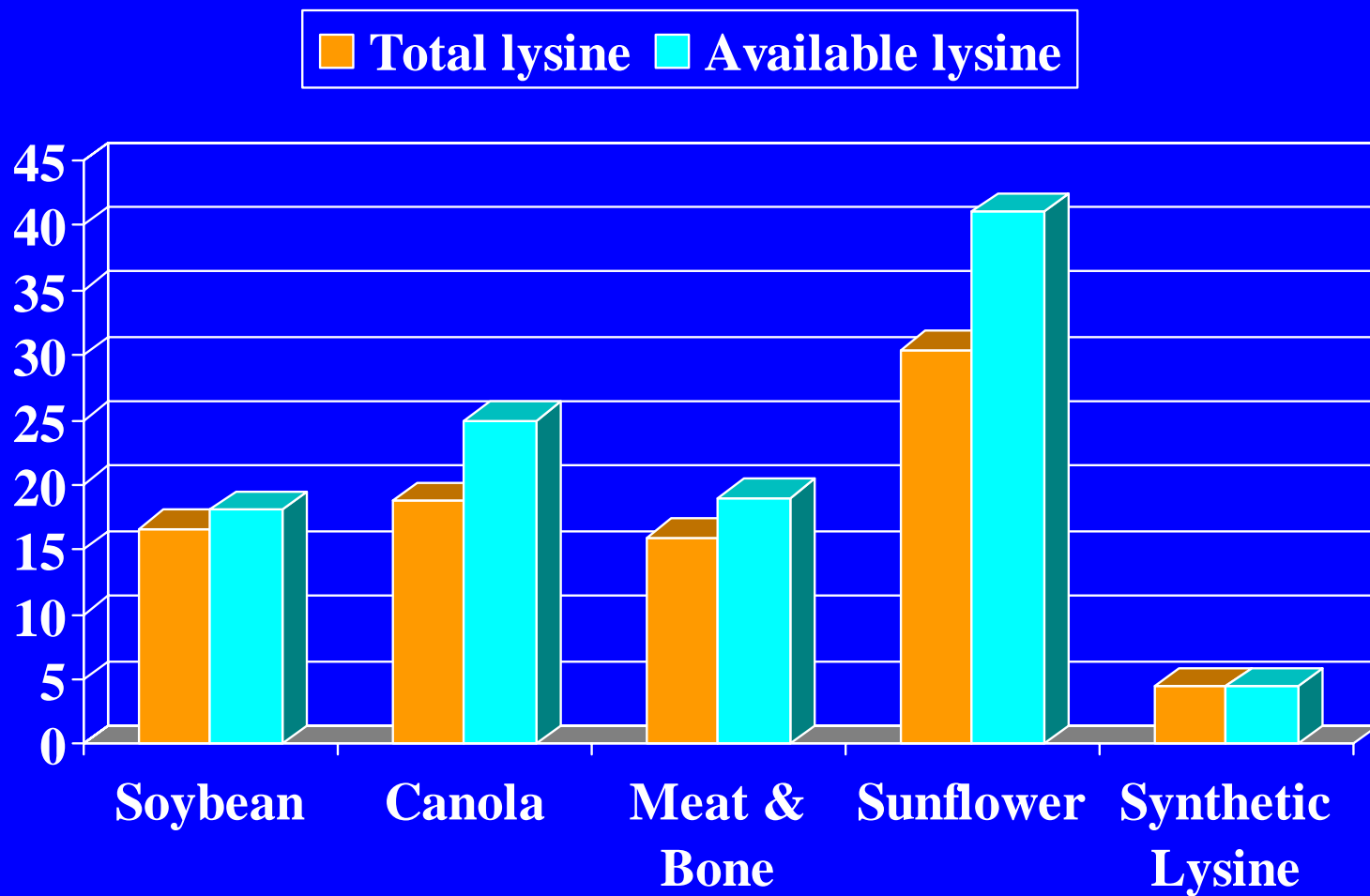
**LEADING TO**

- 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)



# 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