

# Welcome and Overview

Canola Meal Competitive Situation and CCC Goals

## Canola Meal Research Meeting

September 27-28, 2007  
Saskatoon

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Canola Council of Canada



The purpose of this meeting is to discuss and prioritize the research required for canola meal to increase its competitive value in animal feeds - in the context of Canadian canola industry goals.



# Goals for 2015

Element	2006	2015 Target
<i>Export Seed</i>	<i>5.2 million tonnes</i>	<i>7.5 million tonnes</i>
Japan	2.00 million tonnes	2.00 million tonnes
Mexico	1.20 million tonnes	1.50 million tonnes
US	0.50 million tonnes	1.00 million tonnes
EU	0.00 million tonnes	1.00 million tonnes
Other (Pakistan, China, etc.)	1.50 million tonnes	2.00 million tonnes
<i>Domestic Crush</i>	<i>3.7 million tonnes</i>	<i>7.5 million tonnes</i>
Biodiesel (domestic)	0.05 million tonnes	2.00 million tonnes
Biodiesel (export oil)	0.25 million tonnes	0.50 million tonnes
Food (domestic & export)	3.40 million tonnes	5.00 million tonnes

Biodiesel demand includes other non-food applications





# Goals for 2015

Element	2006	2015 Target
Production Acres Yield	9.1 million tonnes 13 million 32 bu/acre	15 million tonnes 30% increase (17 million) 35% increase (40.5 bu/acre)
Oil content	42.5% average	45% average
Classic to Designer Ratio	90/10	75/25
Meal	2000 kcals/kg energy content (poultry)	10% increase (90% of soybean meal energy level)







# Future challenges for canola meal

- Supply will increase and exceed capacity of high value markets (dairy)
- Canola meal will need improvement to achieve greater value
  - Greater value for monogastric feed markets
  - More high value niche applications
  - Alternative uses (non feed)



## Nutrient composition of canola meal and soybean meal

	Canola meal	Soybean meal
Protein, %	36.0	47.0
Oil, %	3.5	0.8
Crude Fibre, %	12.0	4.0
Poultry ME, kcal/kg	2000	2400



# Canola meal value

## Strengths:

- High levels of methionine, cystine and histidine – good for dairy cattle and laying chickens
- High ADF/NDF ratio – good for dairy cattle
- High phosphorus levels
- Not antigenic

## Weaknesses:

- Low lysine levels – penalty for meat producing animals
- Low biological energy values for monogastrics – penalty for poultry





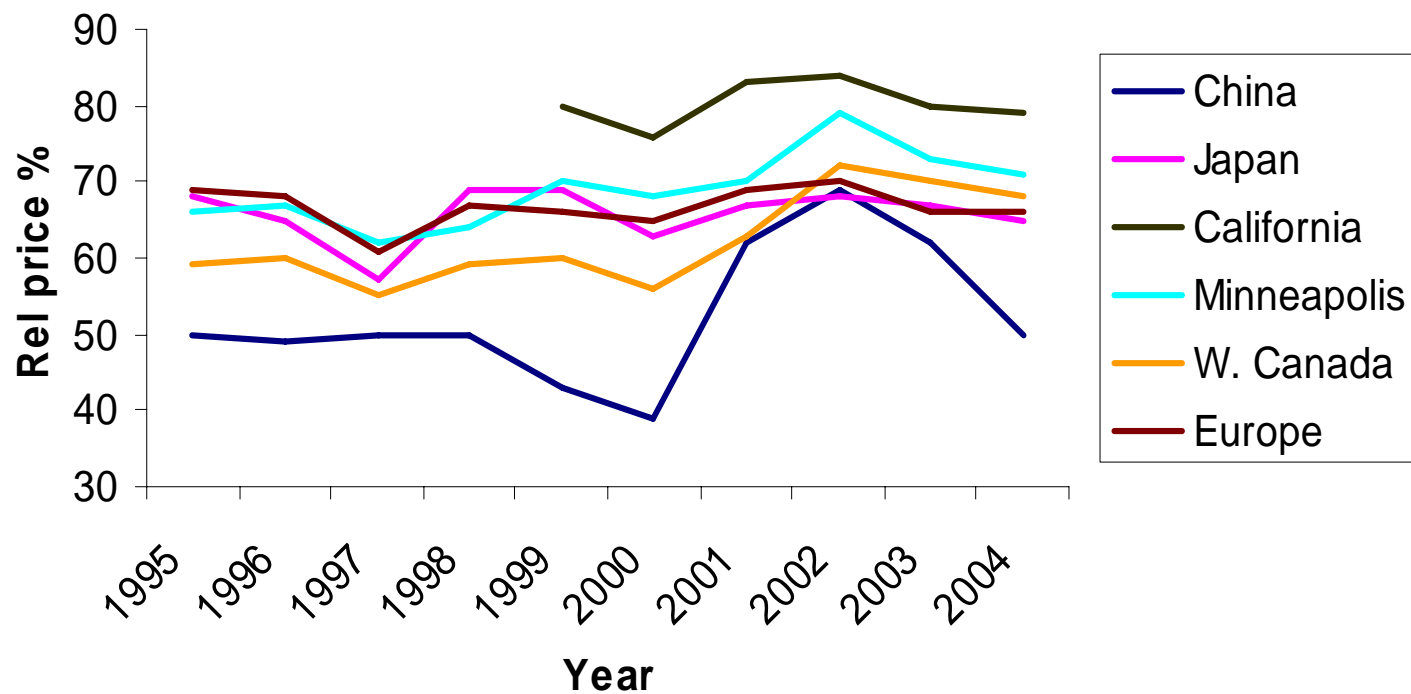
# Canola meal value

Canola meal is the second most popular protein meal in world. Value is related to soybean meal

- Canola meal has 75% the protein of 47% protein soybean meal
- Canola meal has 80% - 90% the energy value of dehulled soybean meal
- The price of canola meal usually ranges between 60% and 70% the price of soybean meal



## Canola meal / Soy meal relative price





# Canadian canola meal production and markets

	<b>2002-03</b>	<b>2003-04</b>	<b>2004-05</b>	<b>2005-06</b>
<b>Stocks</b>	21.0	25.0	23.0	18.0
<b>Production</b>	1,390.0	2,120.0	1,904.0	2,060.0
<b>Imports</b>	20.0	3.0	2.0	2.0
<b>Total Supply</b>	1,431.0	2,148.0	1,929.0	2,080.0
<b>Exports</b>	830.0	1,572.0	1,414.0	1,550.0
<b>Domestic Utilization</b>	576.0	553.0	497.0	510.0
<b>Total Demand</b>	1,406.0	2,125.0	1911.0	2,060.0
<b>Ending Stocks</b>	25.0	23.0	18.0	20.0









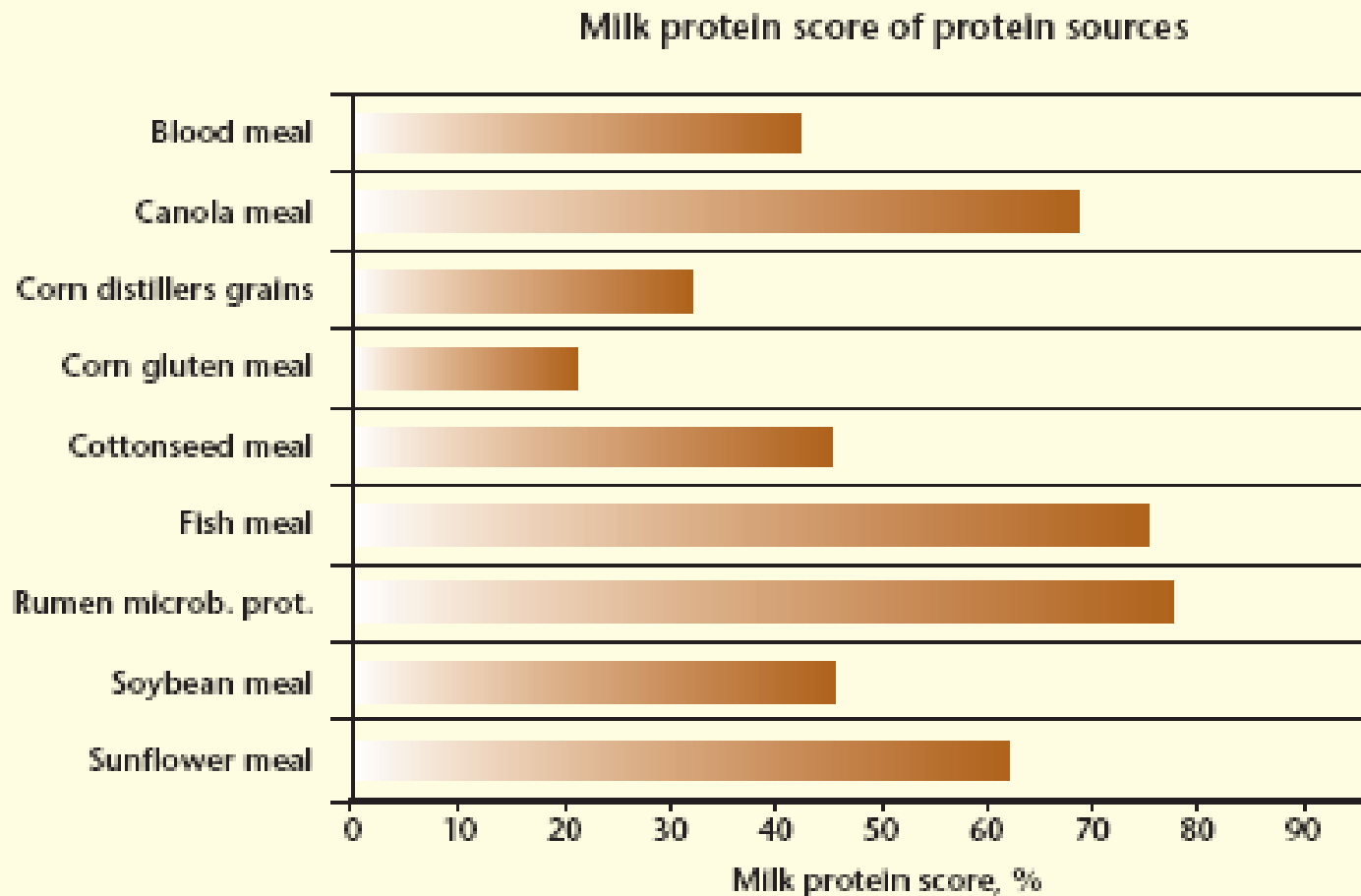
**TABLE 2** Milk production of cows fed canola meal compared to soybean meal or cottonseed meal

	Milk yield (kg/day)	
	Control	Canola
Ingalls and Sharma (1975)	23.0	23.7
Fisher and Walsh (1976)	24.4	23.0
Laarveld and Christensen (1976)	24.9	26.4
Sharma et al. (1977)	20.7	20.9
Sharma et al. (1977)	21.5	21.8
Papas et al. (1978)	24.3	25.2
Papas et al. (1978)	23.9	24.6
Papas et al. (1979)	21.8	22.2
Laarveld et al. (1981)	26.4	27.7
Sanchez and Claypool (1983)	33.4	37.7
DePeters and Bath (1986)	39.8	41.4
Vincent and Hill (1988)	28.5	28.6
Vincent et al. (1990)	25.1	26.7
McLean and Laarveld (1991)	28.9	30.7
McLeod (1991)	17.2	16.9
Emmanuelson et al. (1993)	21.0	21.9
Dewhurst et al. (1999)	24.0	24.5
Dewhurst et al. (1999)	23.7	25.5
<b>Average Milk Yield</b>	<b>25.1</b>	<b>26.1</b>





**Figure 1** Milk protein score of common feed ingredients for dairy cattle (Schingoethe, 1991)



# Expected outcomes of expanded bio-fuel industry with regard to North American feed industry

- Feed grains. 35 – 40 million additional tonnes for ethanol production. Supply of corn and feed wheat for animal feed should not be too constrained by increased demand for ethanol production since supply growth and reduced exports should compensate. The 35 – 40 million tonnes of increased demand over the next 6 years represents less than 10% of total supply, and the increase in demand is expected to be incremental and gradual. There may be periodic price spikes due to shortages and the ability of the ethanol market to pay a premium.
- Protein ingredients. Over 20 million tonnes additional supply. Soybean meal supply is expected to increase 8 million tonnes, canola meal supply is expected to increase almost 2 million tonnes and distillers grains supply is expected to increase over 10 million tonnes. This 20 million tonne increase in the supply of these 3 protein ingredients is a 40% increase over the base of 50 million tonnes current production. Increased exports outside of Canada and the U.S. could account for up to 10 million tonnes but there will still be a net increased North American utilization of at least 10 million tonnes.





# Expected implications for animal feeding in Western Canada

- Will increase emphasis on using protein and oil as energy sources rather than starch which will create feed formulation challenges:
  - Altered carcass and meat quality – less marbling
  - Reduced feed efficiency due to increased protein metabolism
  - Environmental issues with increased nitrogen and phosphorus excretion



# Expected long term implications

- Increased use of protein ingredients for alternative uses. Use as fuel or fertilizer commonly considered. Canola meal and distillers grains have similar thermal value to coal. Establish base value at coal prices – currently about \$60/t.
- Develop edible markets for distillers grains and canola meal – extract high value components
- Increase in energy value of protein ingredients – especially canola meal\*
  - Processing
  - Breeding new varieties
  - Enzyme technology

\* A priority for the Canadian canola industry



# Canola meal relative value to soybean meal

Animal type	Relative value (% soybean meal)
Broiler chicken	55% - 65%
Layer chicken	60% - 70%
Hog grower	65% - 75%
Dairy Cattle	70% - 85%





## Canola meal value increase (\$/T) with 10% nutrient increase

Nutrient	Broiler chicken	Hog grower	Dairy
Protein: 35% vs 38.5%	\$8	\$3	\$10
Lysine: 2.02% vs 2.22%	\$3	\$3	\$0
Digestible lysine: 78% vs 88%	\$3	\$3	\$0
Energy: 100% vs 110%	\$15	\$3	\$2



# Canola meal strategic plan

Increase the energy in canola meal to better compete with soybean meal and other protein ingredients in swine and poultry feeds



# Energy Content of Meal

Possible methods of increasing the bio-available energy content of canola meal:

- Reduce fibre (and other low-energy components) of canola through breeding
  - Thinner hulls (yellow seed – napus, juncea)
  - Easier dehulling
  - Larger seed size
  - Altered carbohydrate composition
  
- Increase canola meal energy levels through processing (dehulling, temperature control)
  
- Use digestive enzymes in feeds to increase energy levels





# Canola Meal Components

Protein – good for animal feed and human food

Sugars, Starch – good for animal feed, fermentation

Cellulose – good for fermentation, would need enzymes for monogastric (pigs, poultry) digestion

Other carbohydrates – some have value, some are a problem



# Canola Meal Components

<b>Component, %</b>	<b>Soybean Meal</b>	<b>Canola Meal</b>
Moisture	10	10
Protein	47	36
Oil	1	3
Ash	5	6
Starch + Sugars	16	14
Cellulose	5	5
Lignin	1	8
Other carbohydrates	15	18
<b>Total</b>	<b>100</b>	<b>100</b>



# Canola Meal Components

<b>Component, %</b>	<b>Canola Meal</b>
Moisture	10
Protein	36
Oil	2
Ash	6
Starch	5
Sugar	9
Cellulose	5
Lignin	8
Oligosaccharides	3
Gums	3
Glyco – protein, oil, mineral	7
Other polysaccharides	6
<b>Total</b>	<b>100</b>





# Canola meal strategic plan – Action items

## 1. Increasing the energy in canola meal

Establish base NE values

- Breeding (WCC/RRC, general recommendations)
- Processing ( Engineering study)
- Enzymes (Research)

## 2. Solidify position of canola meal in dairy feeds

- University of Saskatchewan
- South Dakota State University



# Canola meal strategic plan – Action items

3. Understand implications of feeding higher protein
  - Altered carcass and meat quality
  - Reduced feed efficiency (protein metabolism)
  - Environment
  
4. New and alternative uses research
  - Extract high value components
  - High value uses research



# Canola meal strategic plan – Action items

5. Cooperate with other meal producers
  - Australian Oilseed Federation, U.S. Canola Association
  - Analytical methods, cooperative research, co-promotion
  
6. Industry meeting
  
7. Technical promotion of canola meal
  - Canola Meal: Feed Industry Guide
  - Canola meal seminars in Mexico, China and Pakistan
  - Canadian promotion

