

Current and future opportunities for Canola meal in the livestock industry

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Canola Meal

- § Co-product (~60%) remaining after oil has been extracted from the seed
- § Canada's canola processing capacity has been growing rapidly
- § Popularity of meal is high in dairy, particularly in the US
- § Differentiation of Canadian Meal?
- § Opportunity to increase demand \$\$



Canola Meal Applications

§ Used in most species

- Poultry
 - Opportunities in broilers if increase energy
- Swine
 - Opportunities in starter diets
- Aquaculture (warm water species – tilapia, carp, salmon if concentrate protein)
- Dairy

§ Extensive GF2 Science cluster research

§ Conducting research at CFRC to add value

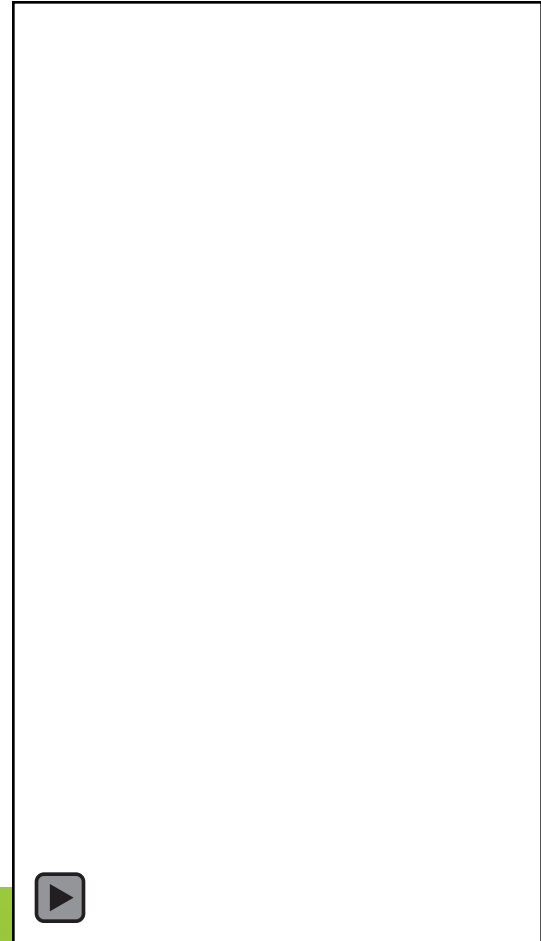
Increasing Digestibility of High Fibre Ingredients

- § Fibre can encapsulate nutrients and reduce digestibility
- § Fibre plays a role in gut health but need it to be in a functional form
- § Can digestibility and functionality be increased?



Steam Explosion

- § Rapid pressurization (cooking) + rapid decompression
- § Water within fibre turns to steam and blows fiber up from within
- § Melts lignin and removes it as a barrier to digestion, degrade hemi-cellulose
- § Increase digestibility of canola meal
- § Trials at UofS and UofA ongoing





Canola Meal versus Soybean Meal

in Dairy Cow Diets

Essi Evans

Technical Advisory Services, Bowmanville, ON

Brittany Dyck

Canola Council of Canada, Winnipeg, MB

Items of Importance to Dairy Farmers

§ Increased efficiency

- Lower costs/unit of milk
- More milk/cow/day
- Reduced environmental impact

§ Better health

§ Good reproductive performance

Why Canola Meal Works

- § Exceptionally good amino acid profile for cows
- § Very high rumen escape (bypass) of protein
- § Helps to maintain a healthy rumen
- § Excellent palatability
- § Recent press release and presentation by Dr. Kenneth Kalscheur at U.S. Dairy Forage Research Center in Madison, Wisconsin highlights the benefits of canola meal in dairy

Why The Trial Was Conducted

- § There have been many recent trials showing the superiority of canola meal
 - Milk yield average 1 kg/cow/day higher with canola meal than with soybean meal
 - Feed costs are lower if diets are formulated for amino acids
- § Many herds particularly in Canada and California only use canola meal as a vegetable protein source- no issues reported
- § There were no published data, however, specific to early lactation

Analyzed Compositions of the Diets

Item (% of DM, unless noted)	LO		HI	
	SBM	CM	SBM	CM
DM (% as fed)	48.9	48.8	48.8	48.8
CP	16.3	16.1	17.8	18.4
NDF	30.8	31.9	27.5	27.3
ADF	22.4	23.1	20.3	20.4
Ether Extract	4.50	4.71	4.59	5.28
Starch	27.8	27.6	26.9	28.1
Ash	6.64	7.05	6.90	6.86

Composition of the Diets

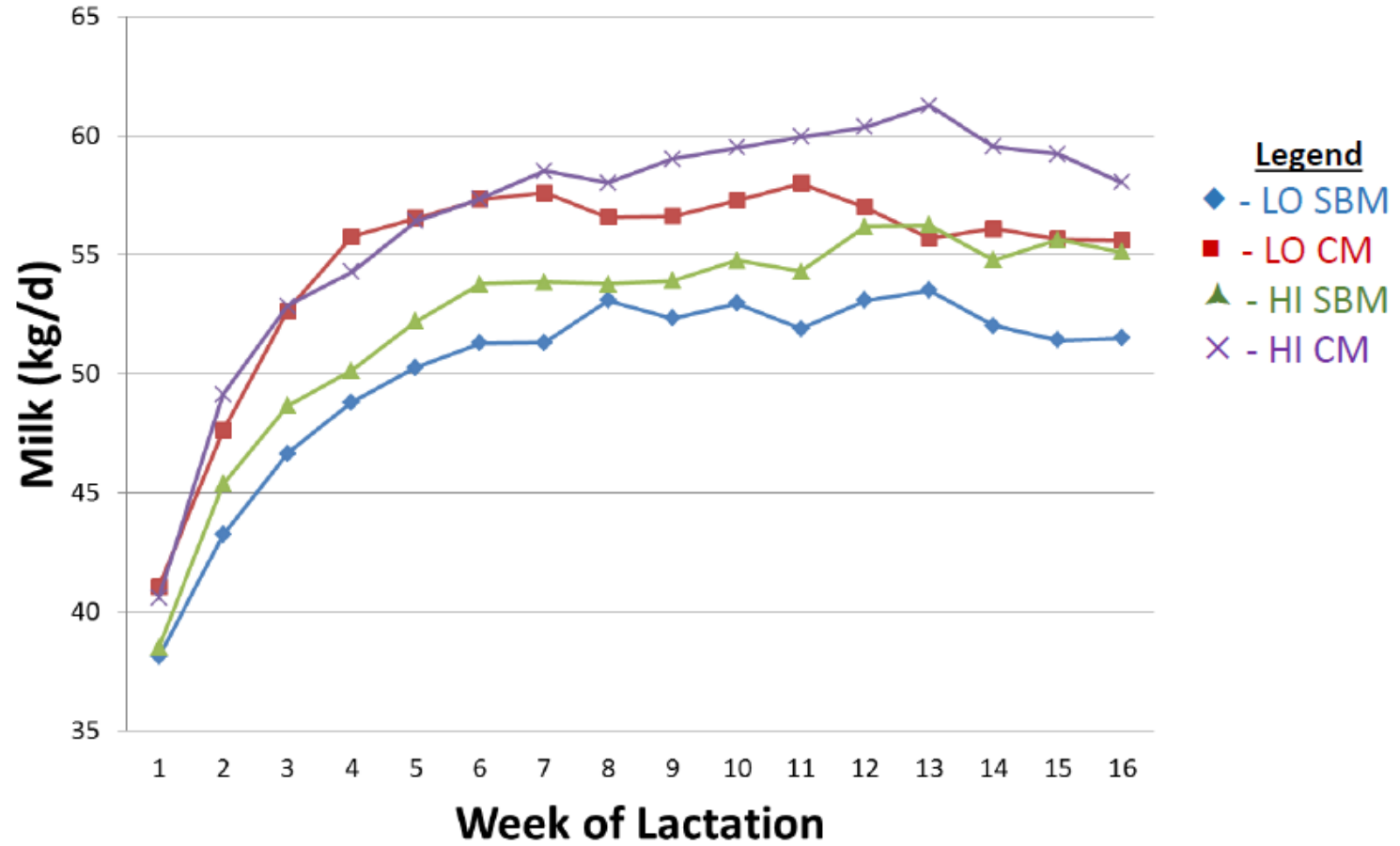
Item	LO		HI	
	SBM	CM	SBM	CM
Ingredient, % of DM				
Corn Silage	39.6	39.6	39.6	39.6
Alfalfa Silage	15.4	15.4	15.4	15.4
Hi-moisture corn	18.0	18.0	18.0	18.0
Canola meal	0.0	11.9	0.0	19.4
Soybean meal	8.9	0.0	14.5	0.0
Soybean hulls	10.5	7.5	4.9	0.0
Corn gluten meal	3.1	3.1	3.1	3.1
Rumen inert fat ¹	2.0	2.0	2.0	2.0
Vitamin and mineral mix	2.5	2.5	2.5	2.5

¹Energy Booster 100 (Milk Specialties, Dundee, IL)

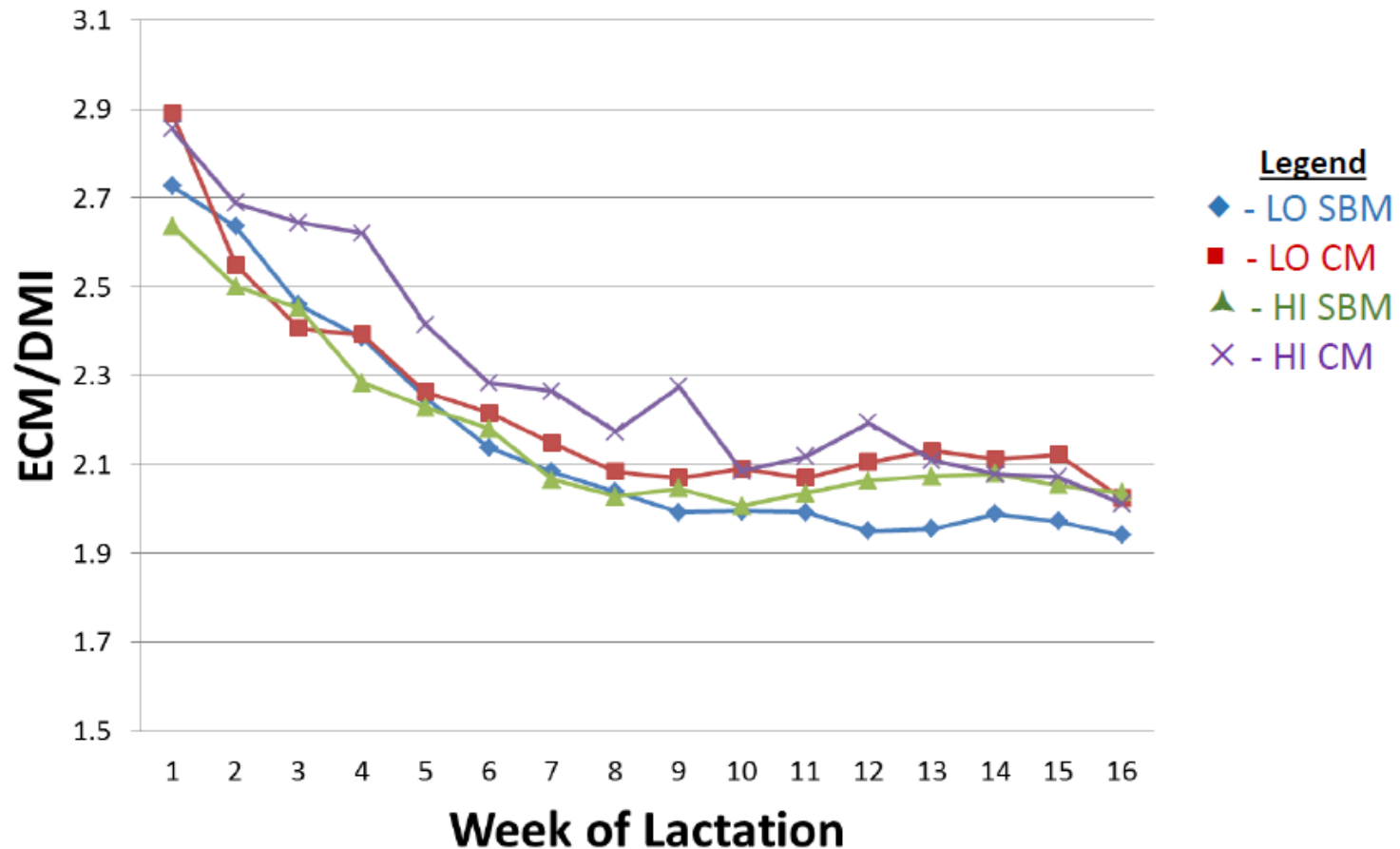
Overall Results

Item	LO		HI		SEM	<i>P</i> <		
	SBM	CM	SBM	CM		CP	S	CP X S
DMI, kg/d	24.6	26.1	25.4	25.6	0.49	0.87	0.09	0.17
Milk yield, kg/d	50.1	54.8	52.3	56.5	1.41	0.16	<0.01	0.83
FCM, kg/d	50.7	54.8	51.3	55.1	1.36	0.73	<0.01	0.90
ECM, kg/d	53.1	57.4	54.1	57.8	1.38	0.61	<0.01	0.87
Feed Efficiency	2.16	2.22	2.17	2.31	0.06	0.34	0.06	0.52

Milk Production By Week



Feed Efficiency by Week



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§ Good reproductive performance



Canola Meal - Feeding the US Dairy Market

- § Enough canola meal going into California to feed all 1.8 million cows 4.5 lb per day
 - Import all protein ingredients
 - Average milk is 23,100 lb
- § Enough canola meal going into Wisconsin to feed all 1.27 million cows 1 lb per day
 - Strong soybean meal market
 - Average milk is 21,700 lb



Science Cluster Results

§ Canola meal nutrient profiling

- Glen Broderick, U.S. Forage Research Lab
- Full in-depth analysis of 36 samples/year for 4 consecutive years
- Include determination of rates of protein degradation and calculation of RUP using the inhibitor method
- Preliminary results presented at ADSA

Science Cluster Results

Faciola et al., Univ. Nevada

	15% CP	15% CP	17% CP	17% CP
	Soybean meal	Canola meal	Soybean meal	Canola meal
DM intake, lb	54.6	55.6	55.4	56.1
Milk yield, lb	86.9	88.4	87.4	90.4
Protein yield, lb	2.62	2.66	2.66	2.73
Fat yield, lb	3.43	3.50	3.52	3.63

Noteworthy

MUN values lower with canola meal diets

Little change in DMI

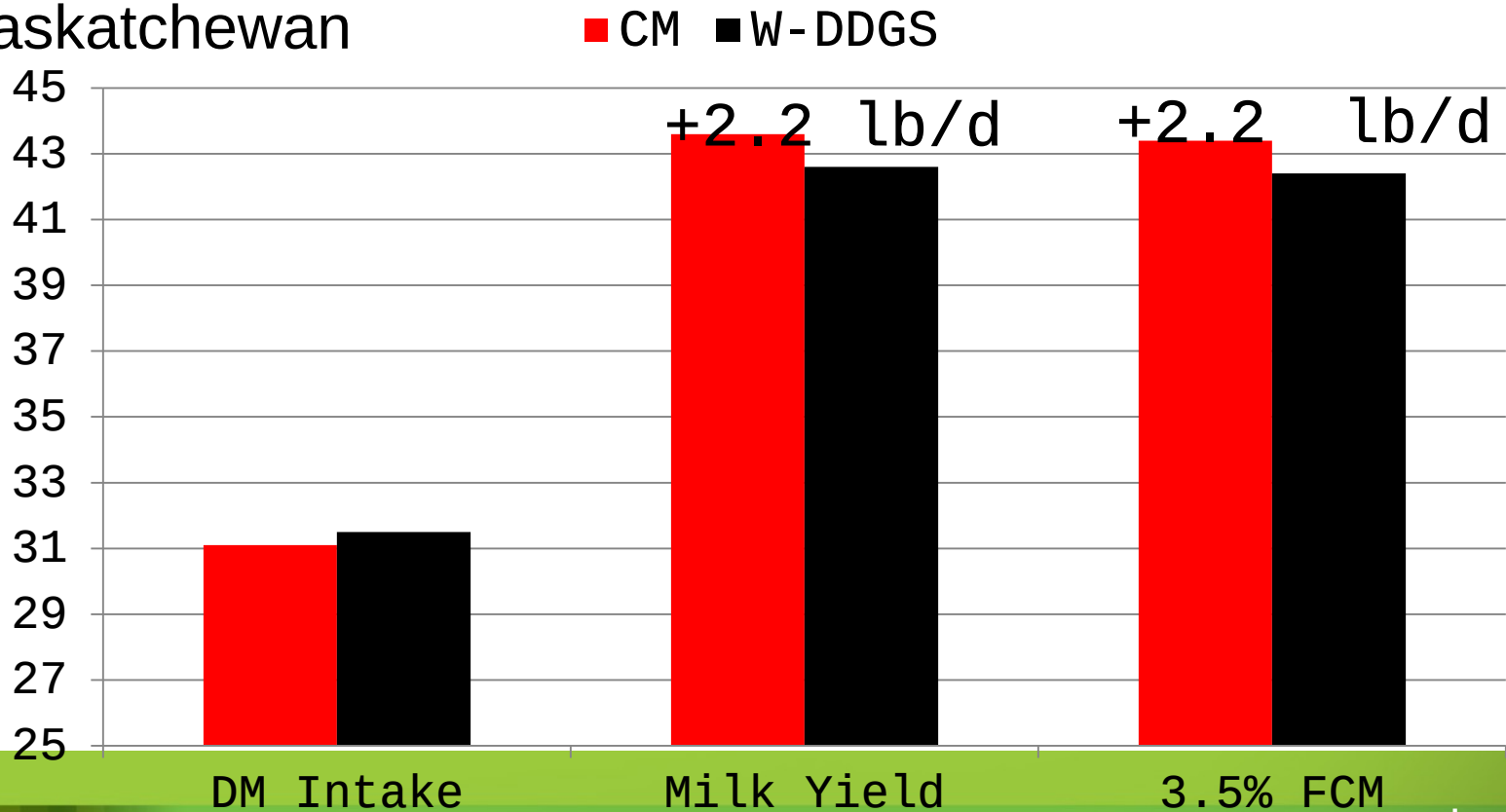
Science Cluster Results

Swanepoel et al, 2014 University of California

	100% Canola meal	67% Canola 33% C- DDGS	33% Canola 67% C- DDGS	100% High Pro Corn DDGS
DMI	53.6	54.6	53.7	53.0
Milk, Lb	104.4	105.5	104.5	99.0
Fat, Lb	3.50	3.58	3.62	3.44
Protein, Lb	3.04	3.08	3.05	2.87
Milk/Feed	1.95	1.93	1.95	1.87
Chg BCS	0.03	0.08	0.03	0.01

Science Cluster Results

Kiran and Mutsvangwa, 2014 , University of
Saskatchewan



Opportunities for Feed Processing?

- § Feed is single largest cost of producing livestock
- § Opportunities to increase profitability:
 - Increase feed efficiency and accuracy of formulation
 - Utilize underutilized ingredients
 - Reduce sorting, mask unpalatable but required ingredients, increase density
 - Training and demonstration
- § Canadian Feed Research Centre (CFRC) built to address these opportunities

The Canadian Feed Research Centre (CFRC)



CFRC

- § Located in North Battleford
- § Owned by UofS
- § Accessible to all University researchers from across Canada
- § Resource for entire livestock value chain
- § Available for hands on training/demonstration for Industry



From Test tube to Feed Trough

§ All stages of research and application

- Small scale development
- Lab scale 50-200 kg batches
- Pilot scale 2 to 7 T/hour integrated production
- Industrial scale 20 T/hour production



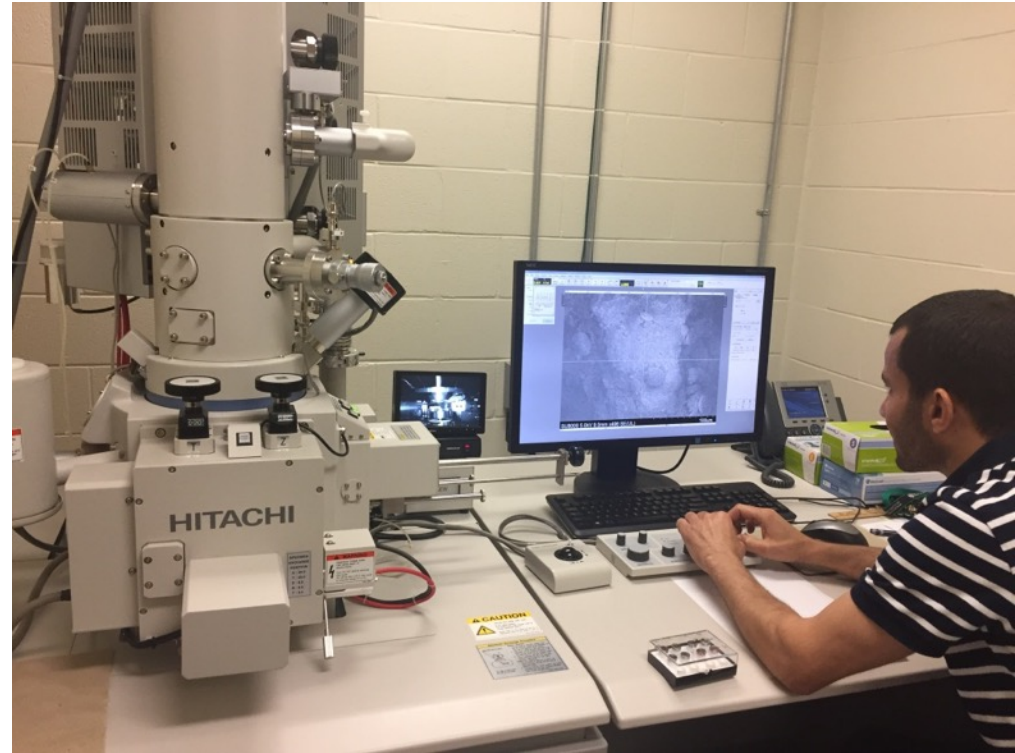
Unique Features of CFRC

§ Standard processes + unique features

- Extrusion, vacuum coating, steam explosion, seed sorting, in-line NIRS, steam flaking, briquetting



Novel Facilities + Access to UofS Labs



Contact information

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§ Come see and use the Canadian Feed Research Centre in North Battleford, Saskatchewan, Canada

Funding

