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UNIVERSITY OF SASKATCHEWAN

Pros and Cons of Feeding Canola Meal

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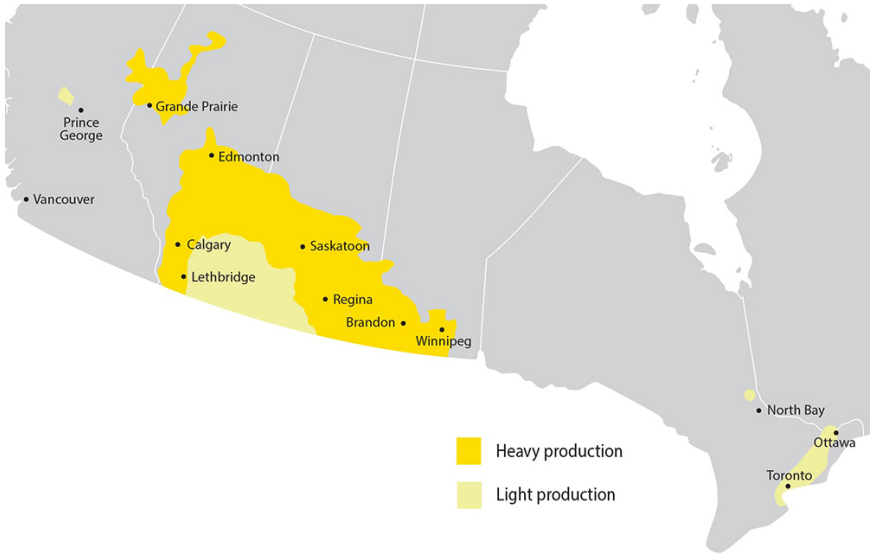
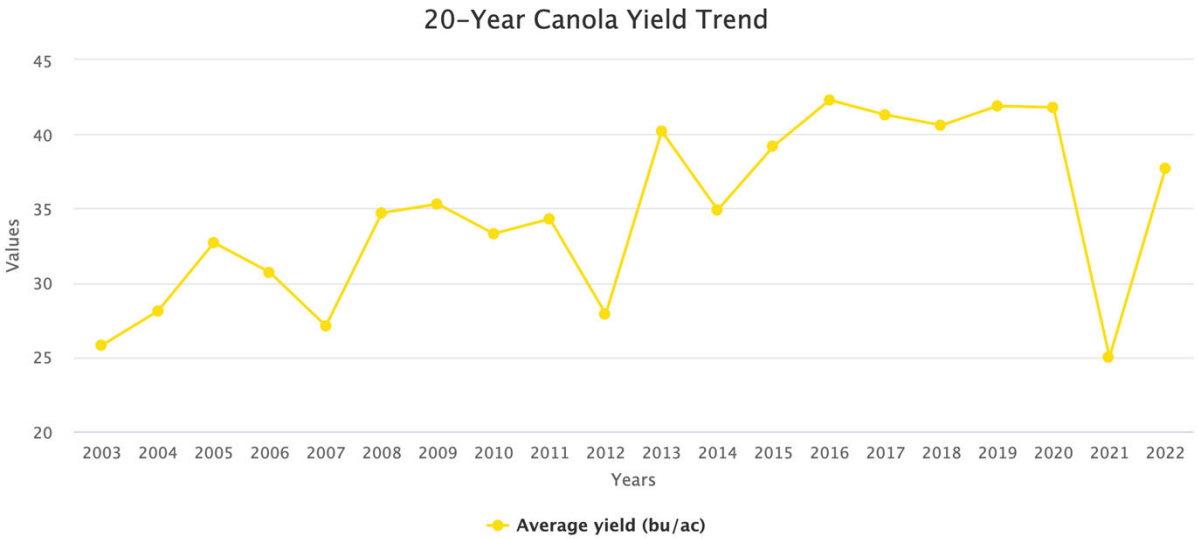
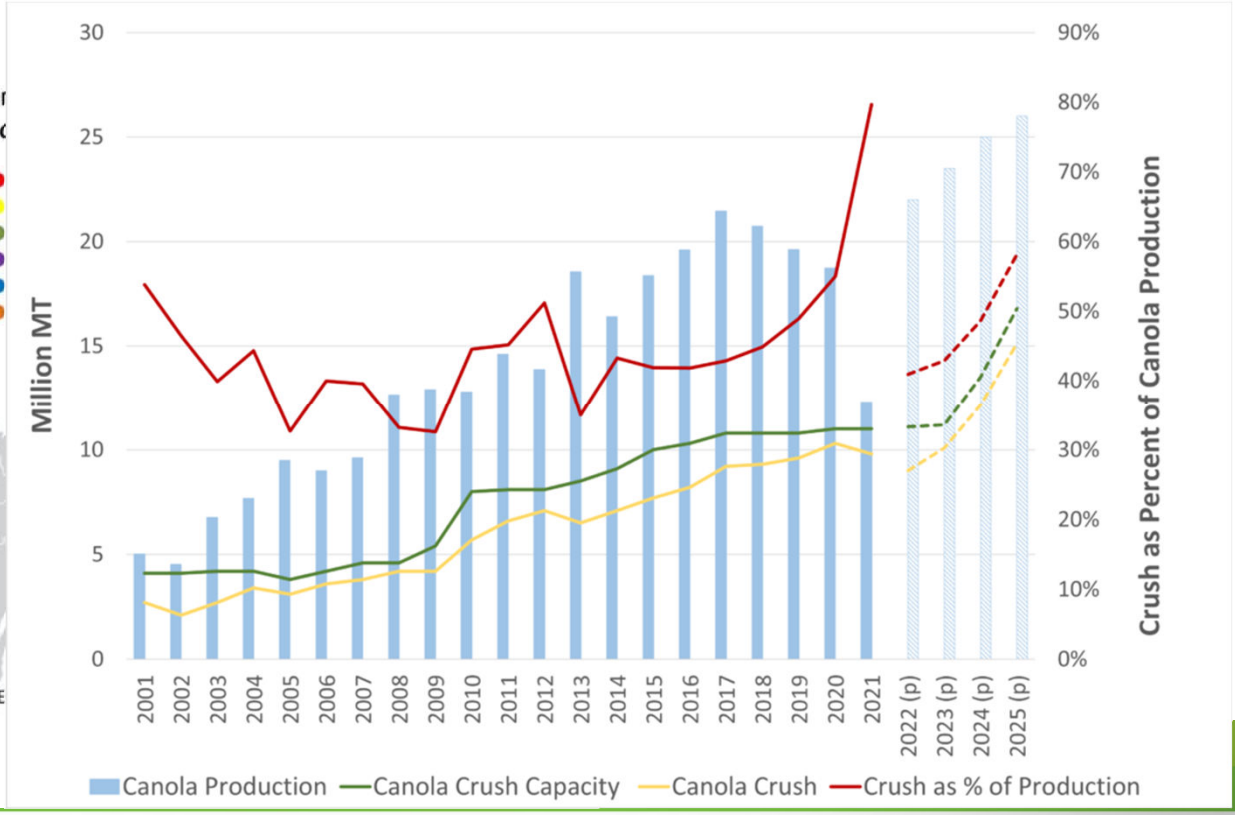
WESTERN CANADA FEEDLOT MANAGEMENT SCHOOL

The canola story



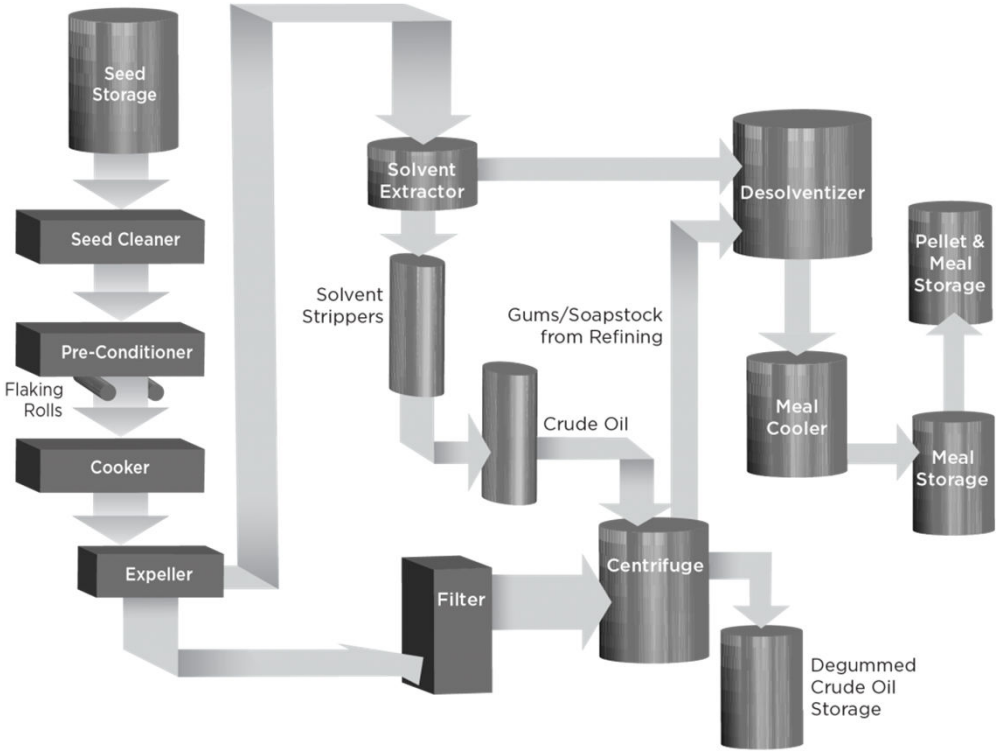


Canola crushing and meal production

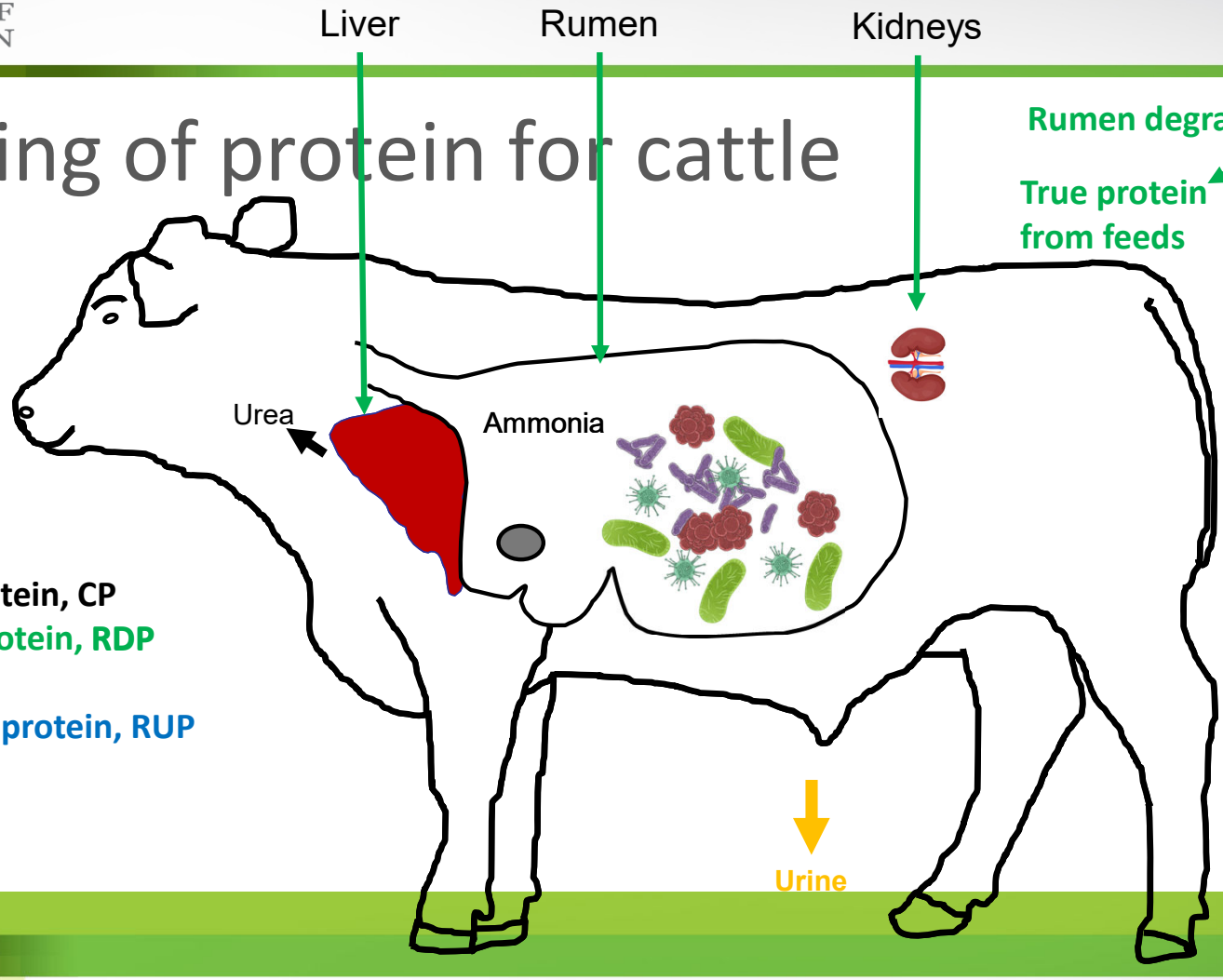


Most of the canola is processed using solvent extraction

- Method of extraction impacts chemical composition
  - Solvent
  - Double-press or expeller
    - Second press of canola meal to extract oil without solvents
  - Cold press
    - Seed is not heated before, during, or after processing



Partitioning of protein for cattle



Rumen degradable protein, RDP

True protein from feeds

Non-protein nitrogen, (e.g. urea)

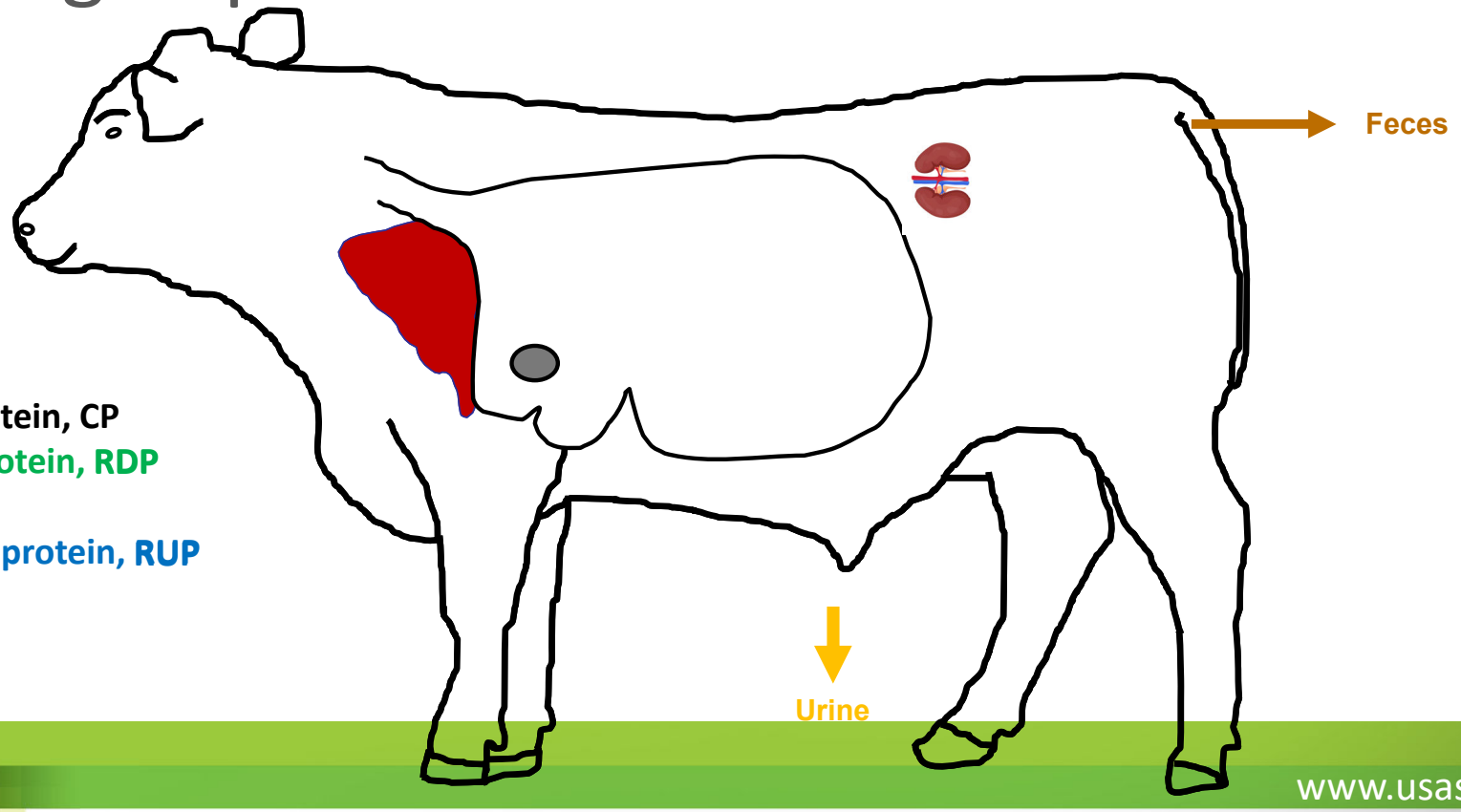
Total dietary crude protein, CP

-Rumen degradable protein, RDP

+

-Rumen undegradable protein, RUP

Partitioning of protein for cattle



Total dietary crude protein, CP

-Rumen degradable protein, RDP

+

-Rumen undegradable protein, RUP

Chemical composition differences

Nutrient	Heat-damaged canola[1]	Canola meal, solvent[2]	Expeller Meal[2,3]	Corn DDGS[1]	Soybean meal[1]	Urea[1]
DM, %	94.7	90.4	88.0	90.0	91.7	99.0
Crude protein, %DM	23.9	42.0	39.0	30.8	52.9	287
RUP, %CP	37.0	53.0	59.1	67.9	29.5	0
Ether extract, %DM	39.8	3.2	12.4-15.0	10.7	1.9	0
NDF, %DM	28.3	29.0	30.49	33.7	11.3	0
ADF, %DM	22.0	18.6	19.0	16.2	7.5	0
Ca, %DM	0.53	0.76	0.71	0.05	0.42	0
P, %DM	0.70	1.17	1.09	0.86	0.75	0
S, %DM	0.4-0.6	0.72	0.65	1.0	0.42	0
NEg[1], Mcal/kg	1.99	1.06	1.63	1.52	1.28	0

[1]NASEM, 2021
[2]https://www.canolacouncil.org/canolamazing/wordpress/download/30/feed-guide/2344/dairy-feed-guide-canola-meal_final_2021_web.pdf
[3]Milligan Bio

Should consider canola meal as a good protein source with limited energy

Chemical composition differences

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Ca, %DM	0.53	0.76	0.71	0.05	0.42	0
P, %DM	0.70	1.17	1.09	0.86	0.75	0
NEg[1], Mcal/kg	1.99	1.06	1.63	1.52	1.28	0
$/MT as is	**750**	**500-525**	**550**	**470**	**840**	**1750**
$/MT CP, DM basis	**$3,138**	**$1,315-1,382**	**$1,410**	**$1,525**	**$1,588**	**$610**

[1]NASEM, 2021
[2]https://www.canolacouncil.org/canolamazing/wordpress/download/30/feed-guide/2344/dairy-feed-guide-canola-meal_final_2021_web.pdf
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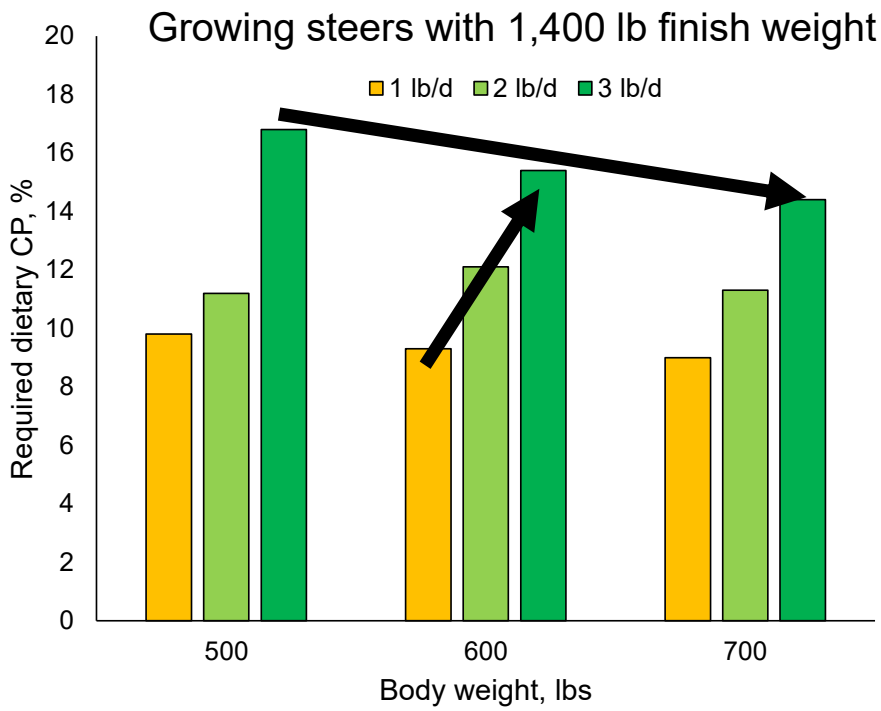
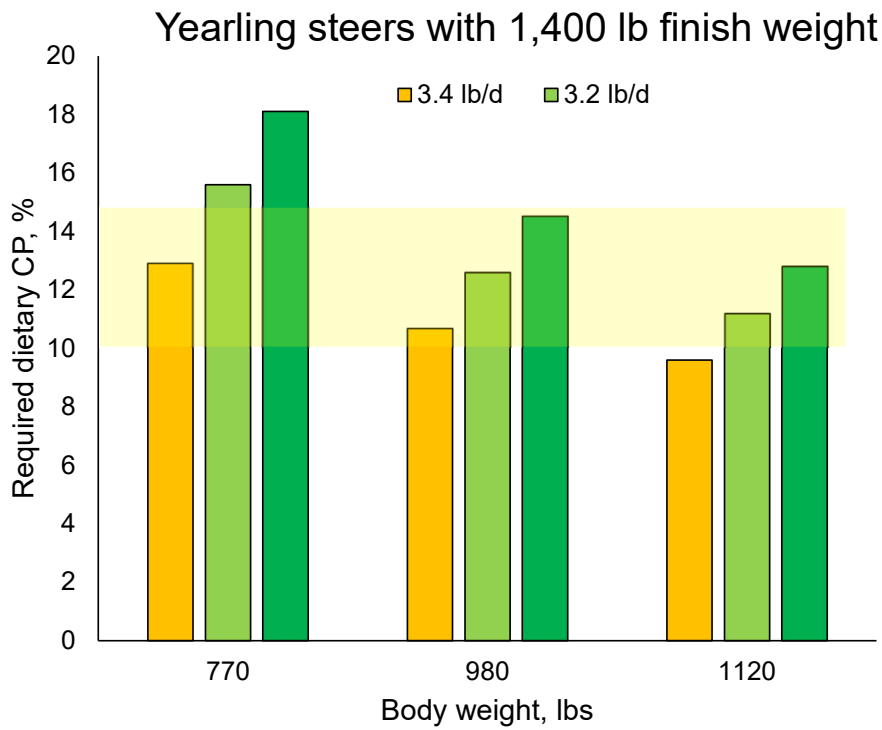
Protein requirements for beef cattle





NASEM, 2016

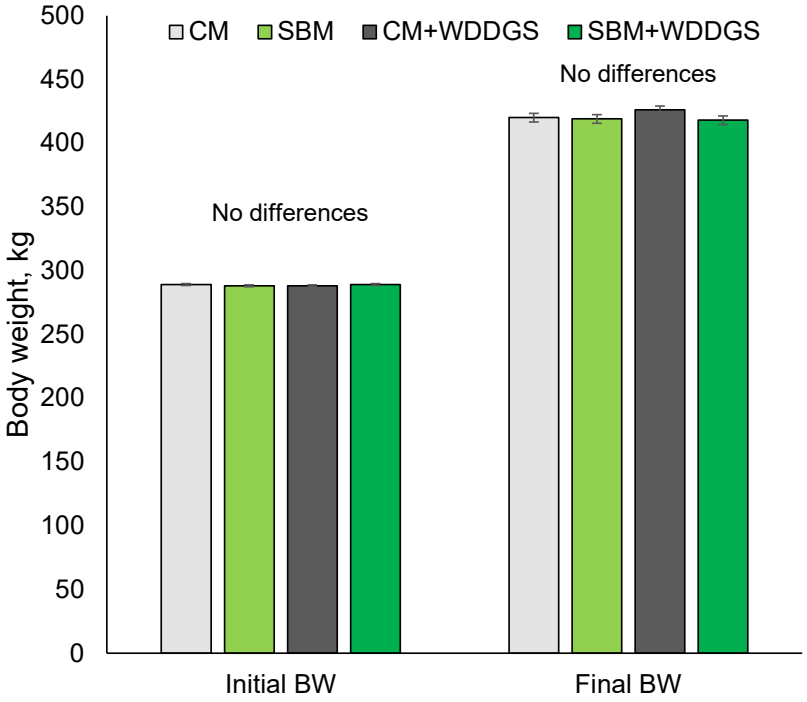
Comparing canola meal with other protein sources

- Extensively studied for dairy cattle
  - Strong knowledge on canola meal digestion and utilization
- Fewer studies conducted for backgrounding or finishing cattle
- Studies have compared canola meal to other protein sources
  - Soybean meal
  - DDGS (wheat or corn)

Good, 2018, MSc. thesis

Comparing CM to SBM and WDDGS

- 4 treatments
  - CM
  - SBM
  - CM + WDDGS
  - SBM + WDDG
- Backgrounding diets contained 13.5% CP with 1.52 and 0.92 Mcal/kg NEm and NEg
- Finishing diets contained 12.5-13% CP with 1.9 and 1.3 Mcal/kg NEm and NEg



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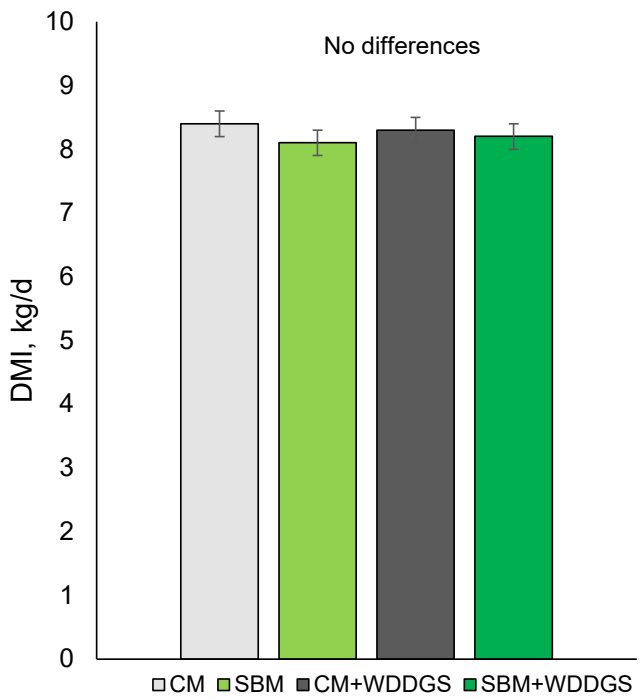
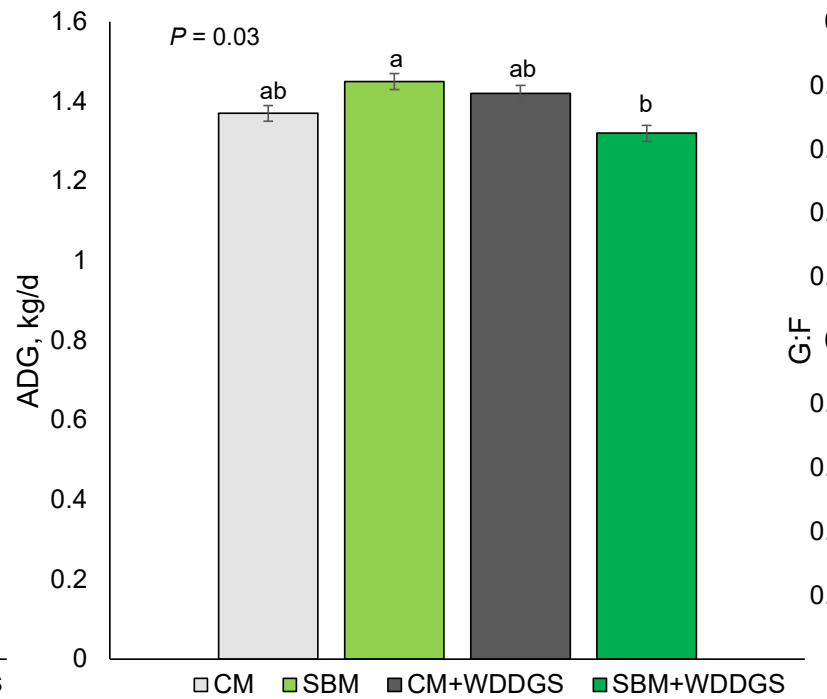
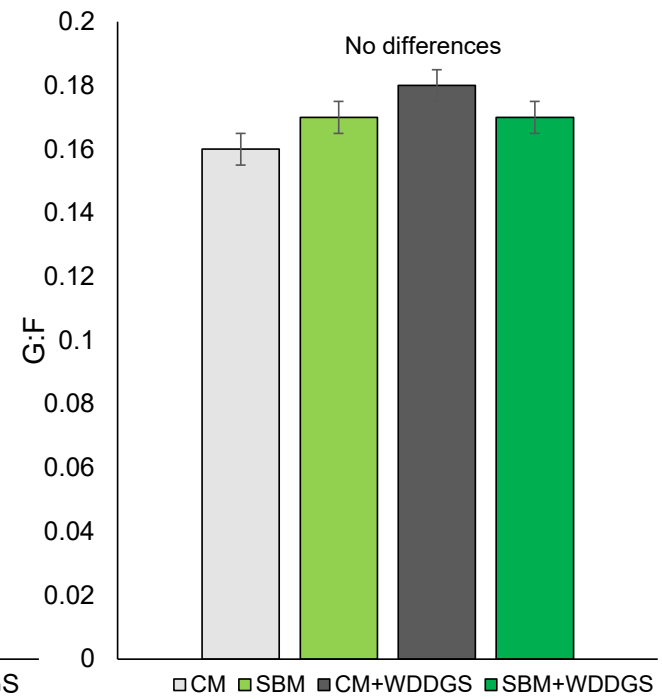
Backgrounding: CM vs. SBM and WDDG



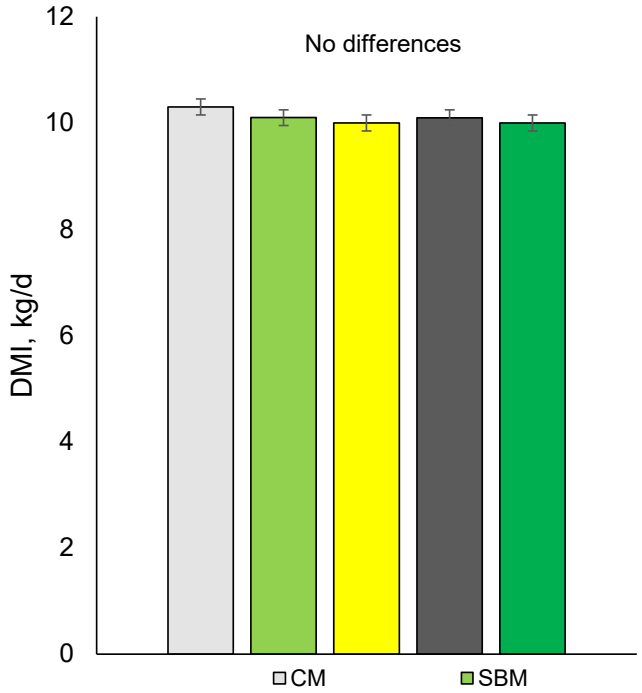


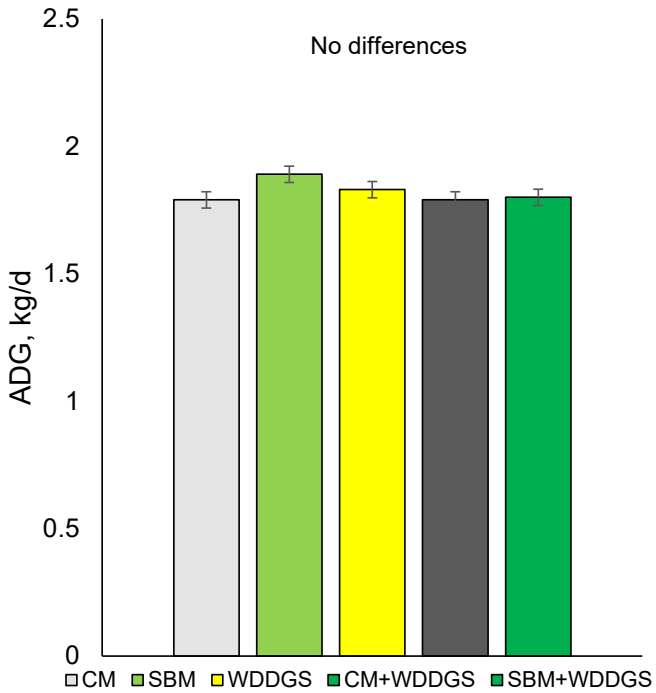


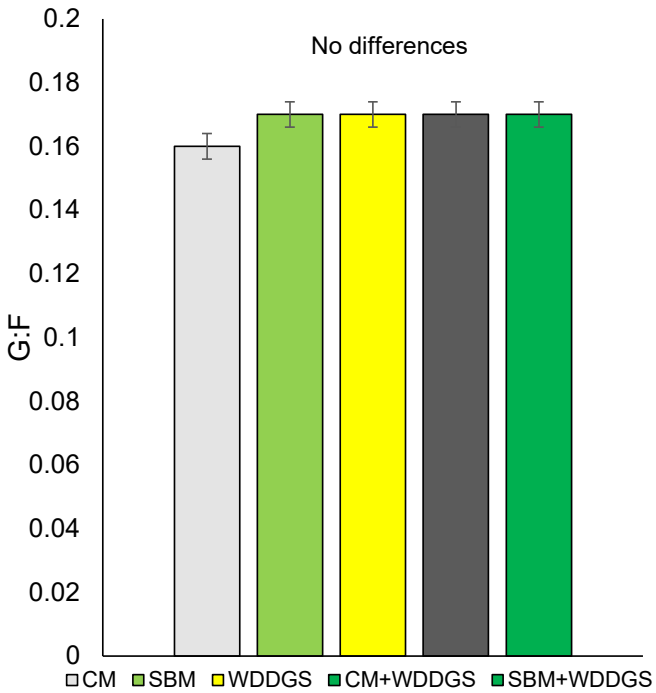
Feed-based cost of gain also not different

Good, 2018, MSc. thesis

Finishing: CM vs. SBM and WDDG



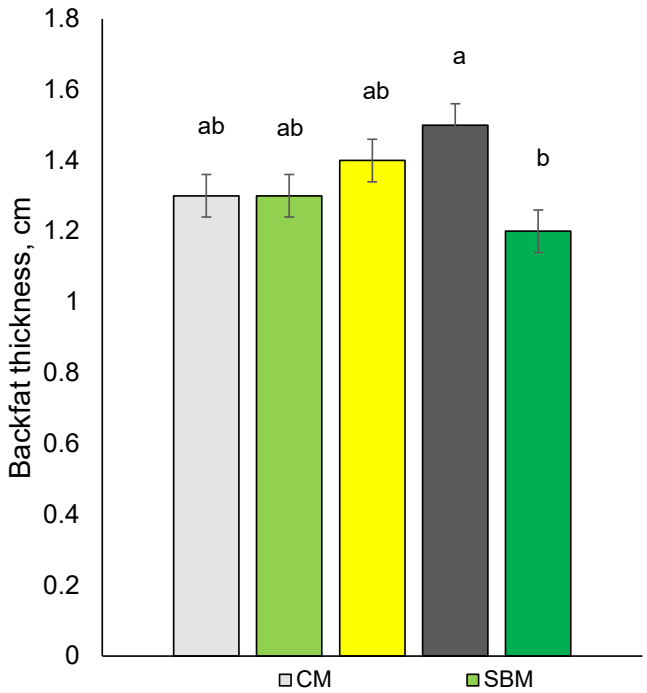


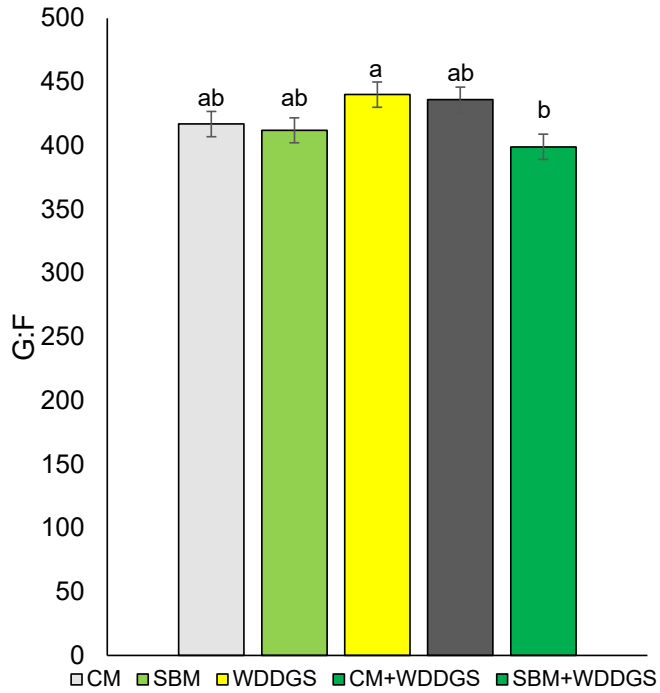


Live BW did not differ (~650 kg)

Good, 2018, MSc. thesis

Finishing: CM vs. SBM and WDDG





- No differences in dressing %
- Yield and quality grades did not differ
- Cost of gain and value of the finished steers did not differ

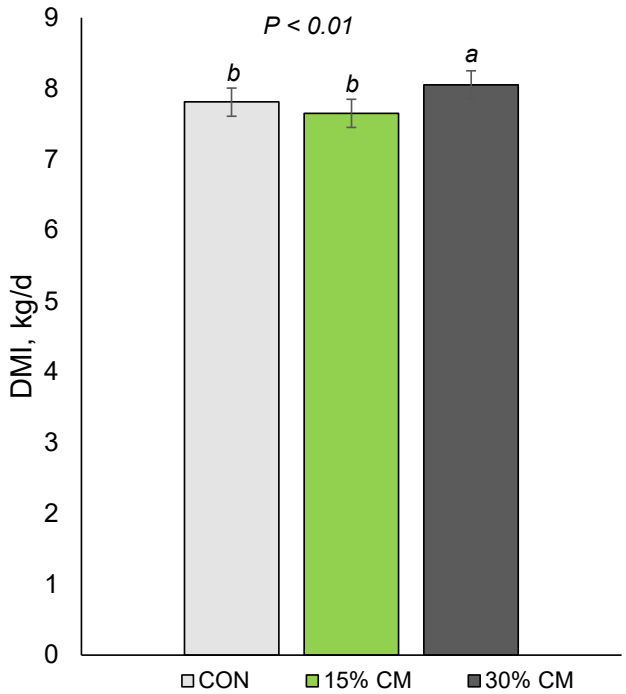
He et al., 2013; CJAS

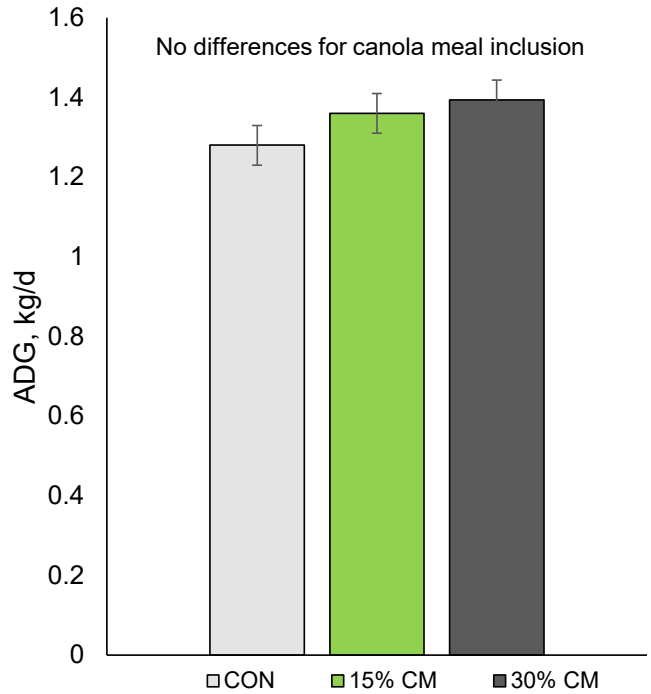
Comparing canola meal as an energy source

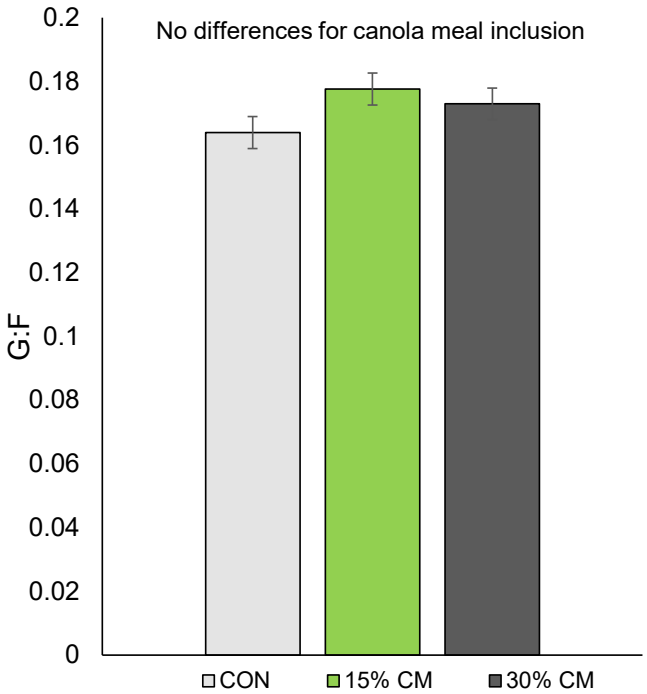
- Canola meal used as a partial replacement for barley grain
  - Backgrounding: 0 vs. 15 vs. 30% CM and 40 vs. 25 vs. 10% barley grain
    - High CP diets: 12 vs. 17 vs. 21%
  - Finishing: 0 vs. 15 vs. 30% CM and 87 vs. 72 vs. 57% barley grain
    - High CP diets: 13 vs. 17 vs. 21%

He et al., 2013; CJAS

Backgrounding: canola meal as an energy source







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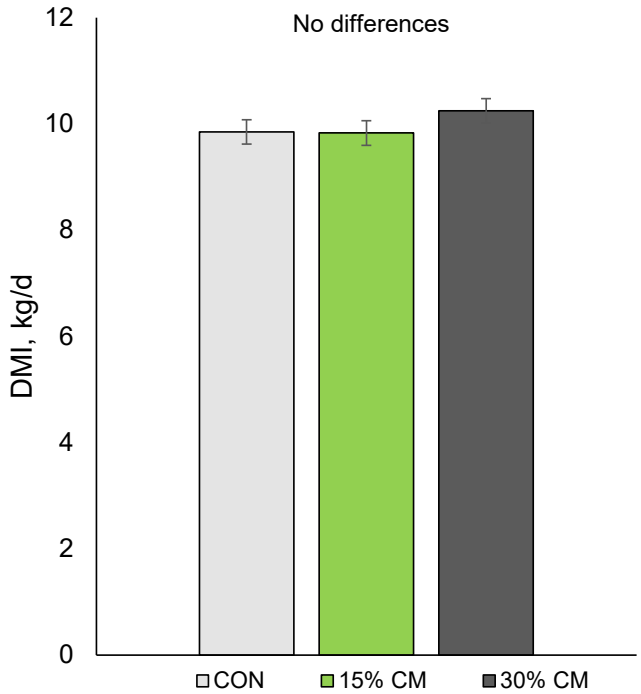
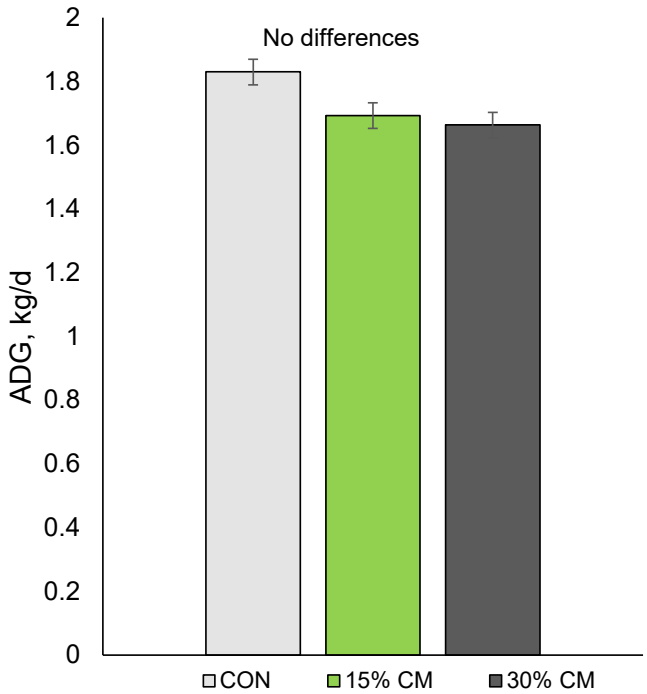
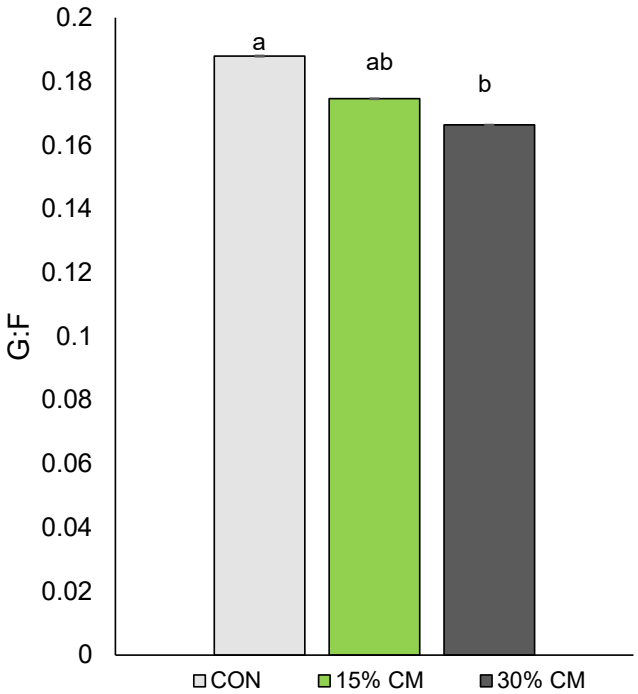






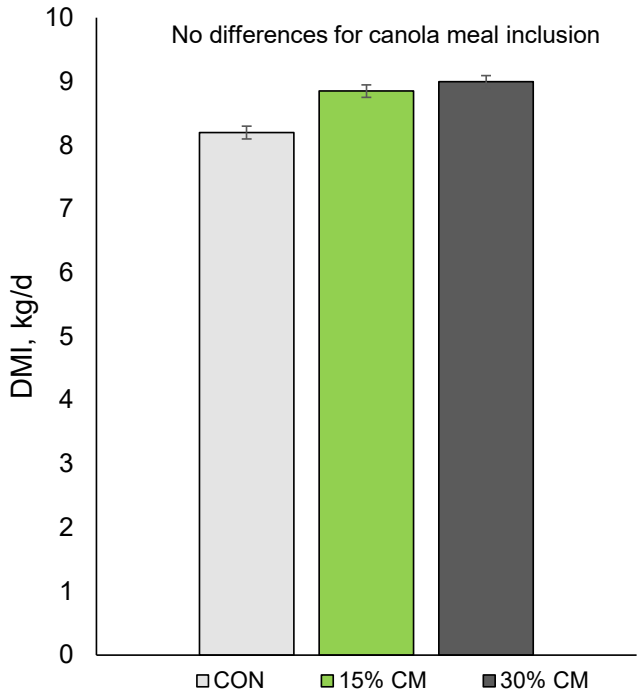
Nair et al., 2015; CJAS

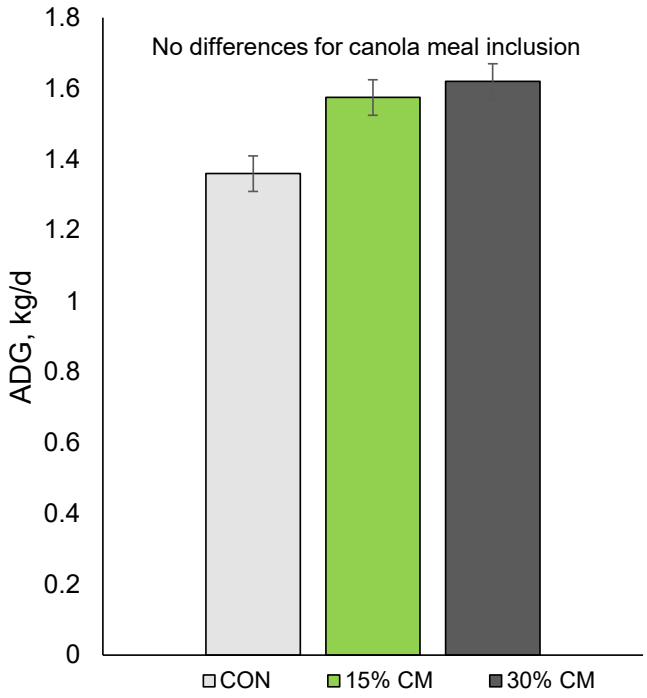
Comparing canola meal as an energy source

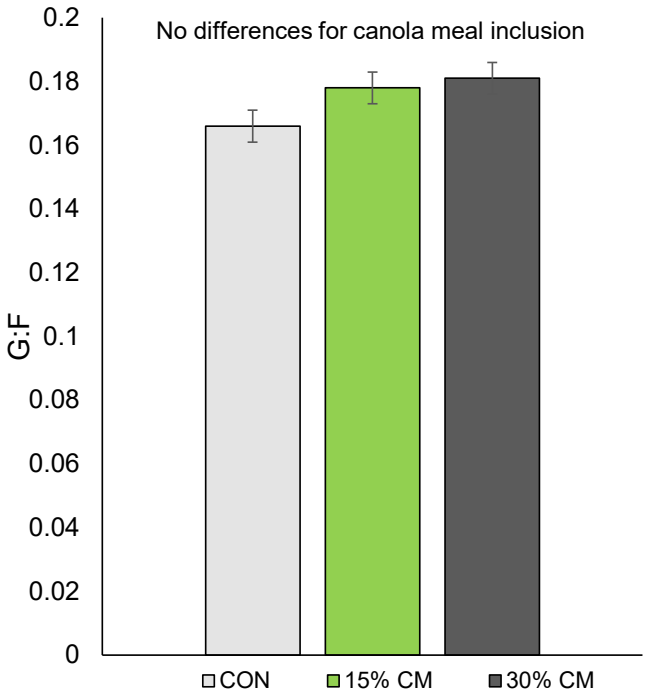
- Canola meal used as a partial replacement for barley grain
  - Backgrounding: 0 vs. 15 vs. 30% CM and 30 vs. 15 vs. 0% barley grain
    - High CP diets: 12 vs. 17 vs. 21%
  - Finishing: 0 vs. 10 vs. 20% CM and 88 vs. 78 vs. 68% barley grain
    - High CP diets: 13 vs. 17 vs. 21%

Nair et al., 2015; CJAS

Backgrounding: canola meal as an energy source







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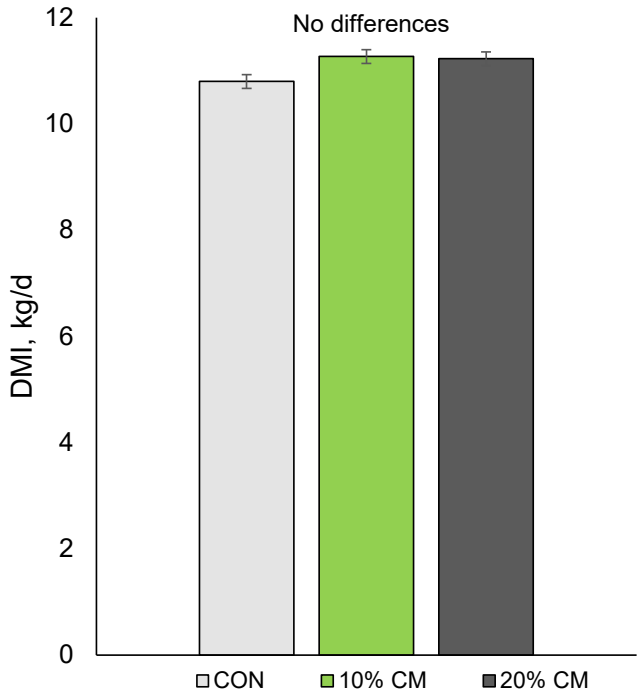

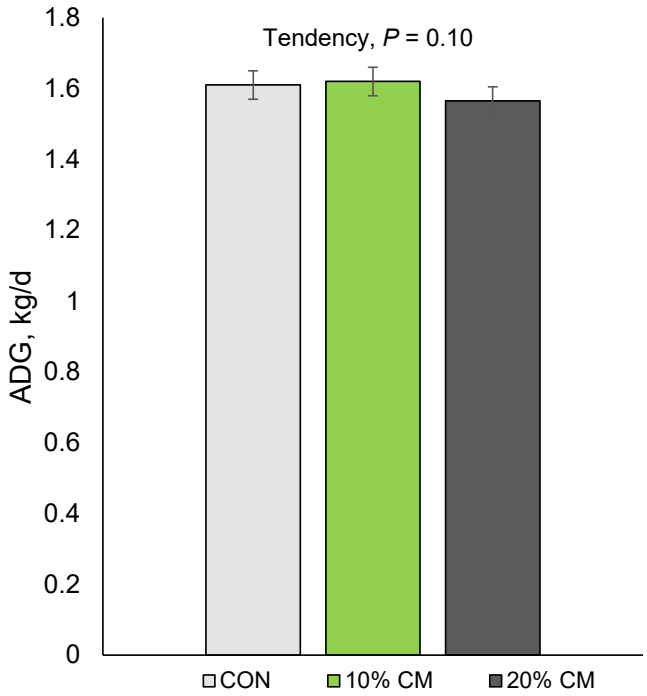

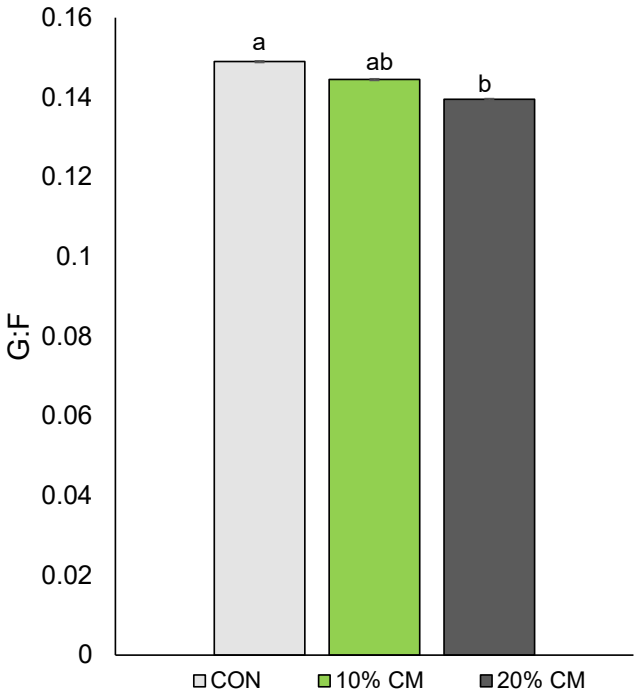

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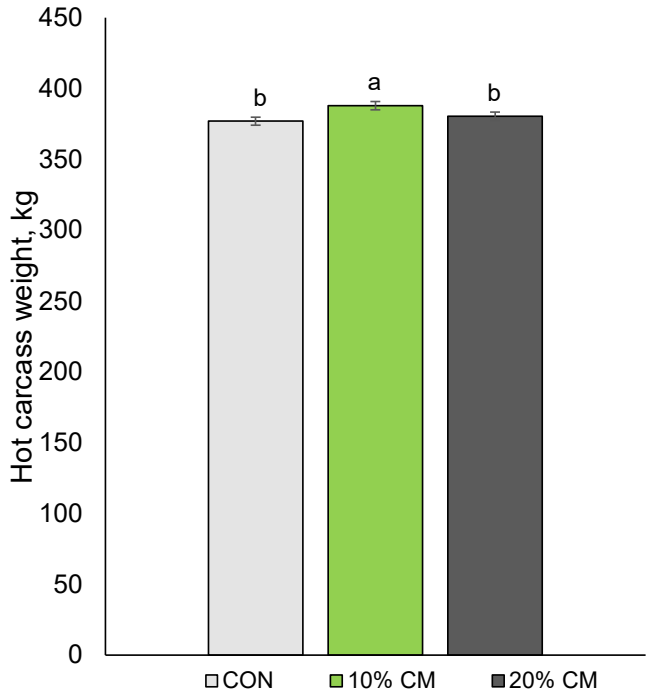
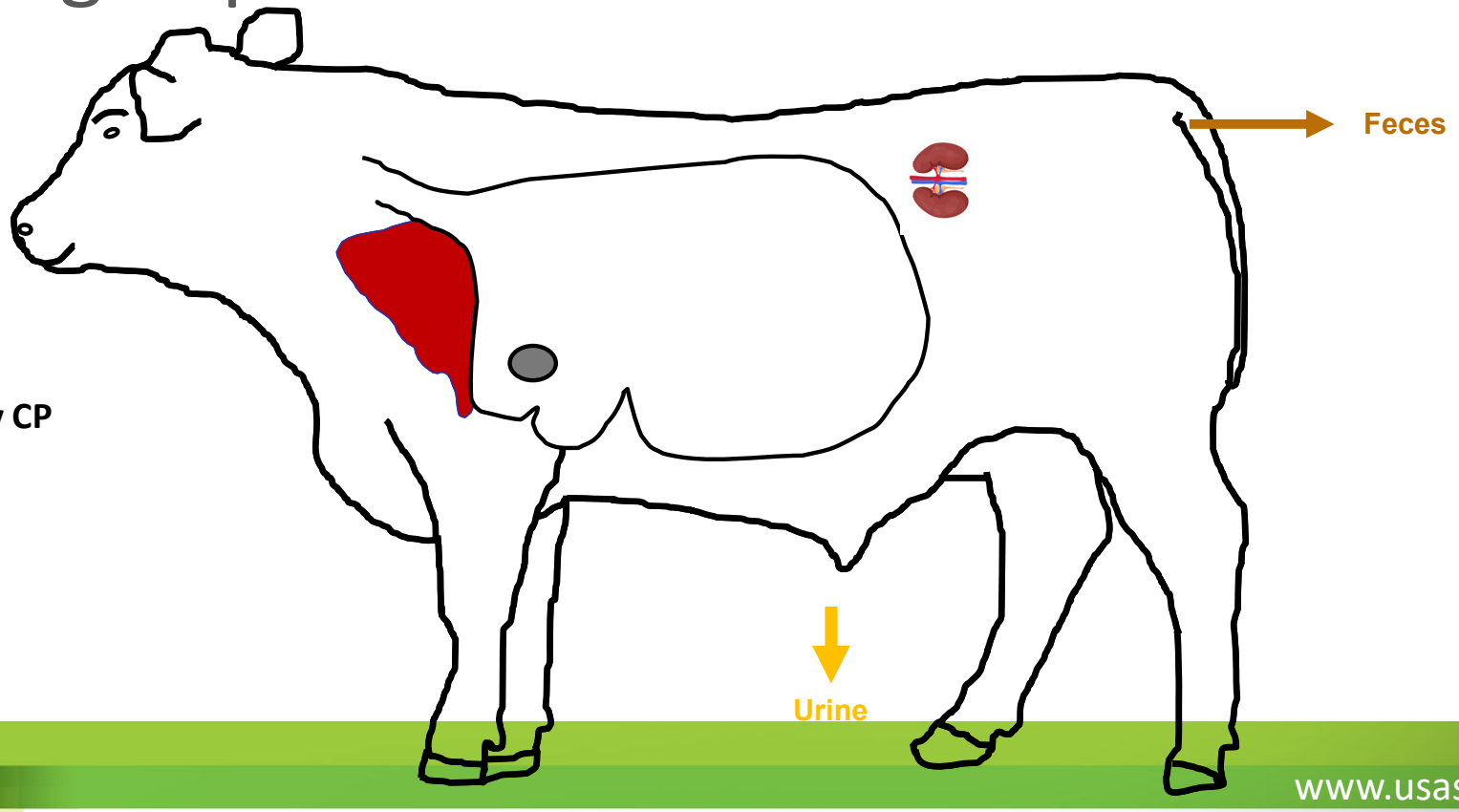


Yield and quality grades were not affected

Partitioning of protein for cattle

Impacts of high dietary CP



Conclusions and take-home messages

- Canola is a good protein source for backgrounding and finishing cattle
- May be cost effective ($/kg protein)
- Up to 30% of the barley can be reduced for backgrounding with minimal effects on performance – but cost $ likely will increase
- Exceeding 20% canola meal inclusion in finishing diets as an energy source will likely reduce performance responses and increase cost
- Overfeeding CP increases urea excretion and N volatility