



Effect of Barley Variety and Stage of Maturity at Harvest on Neutral Detergent Fiber Digestibility (NDFD)

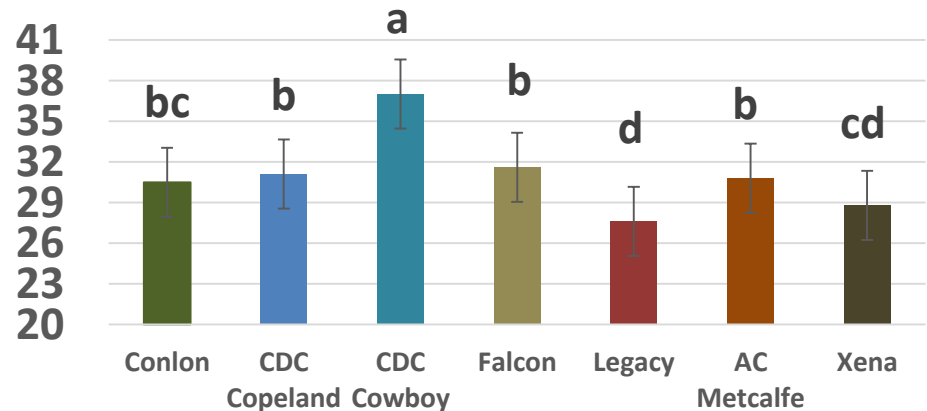
Jayakrishnan Nair
PRP Research Scientist
AAFC Lethbridge

Dairy Info Day
25 January 2018



Introduction

- Based on the results of Study 1
- Neutral detergent fiber digestibility (NDFD) from highest to lowest
 - CDC Cowboy
 - Falcon
 - CDC Copeland
 - AC Metcalfe
 - Conlon
 - Xena
 - Legacy



CDC
Cowboy



CDC
Copeland



Xena



Objectives

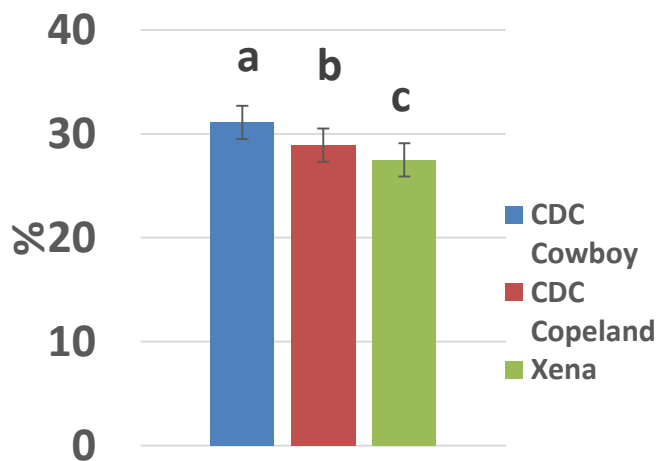
- Is the decline in neutral detergent fiber digestibility with advancing maturity similar across barley varieties??
- What is the best stage of maturity for harvest of these varieties??
- Interaction (variety x maturity)
 - of barley varieties with high (CDC Cowboy), intermediate (CDC Copeland) and low (Xena) Neutral detergent fiber digestibility (NDFD) when harvested at advancing stages of maturity (milk, early-, mid- and hard-dough stage)



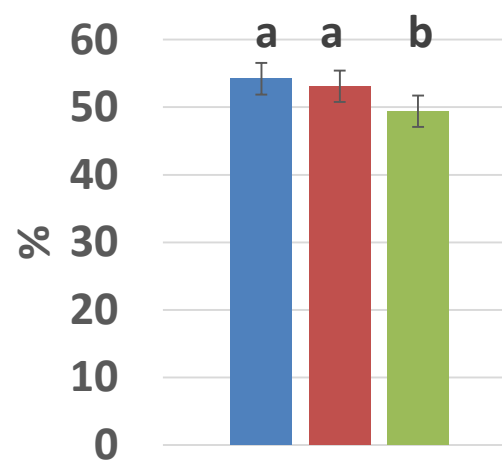
Materials and Methods

- At Kernen Crop Research Farm (U of S)
 - 2 crop years (2014 and 2015)
 - 3 Varieties (CDC Cowboy, CDC Copeland, Xena)
 - 3 replicate plots for each variety
 - Similar agronomic practices
 - Sampled same day across varieties at each stage of maturity
 - Milk, early, mid and hard dough stage
 - Visual evaluation (Zadoks scale)
 - Green feed (not ensiled)

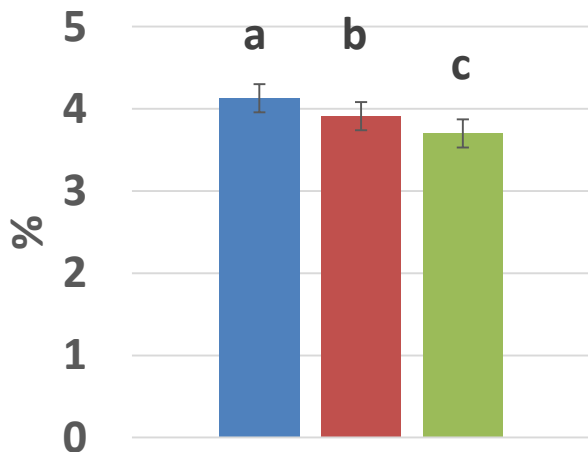




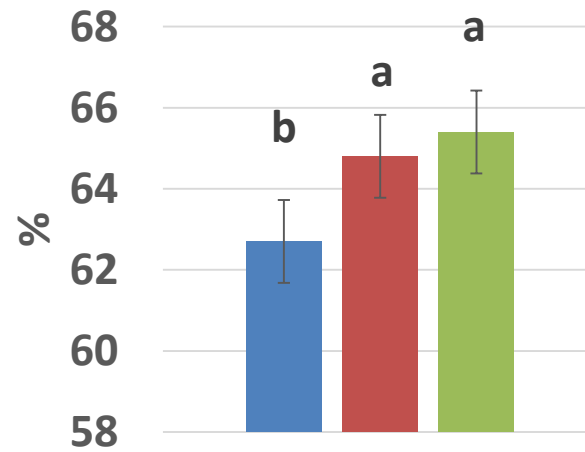
Acid Detergent Fiber



Neutral Detergent Fiber



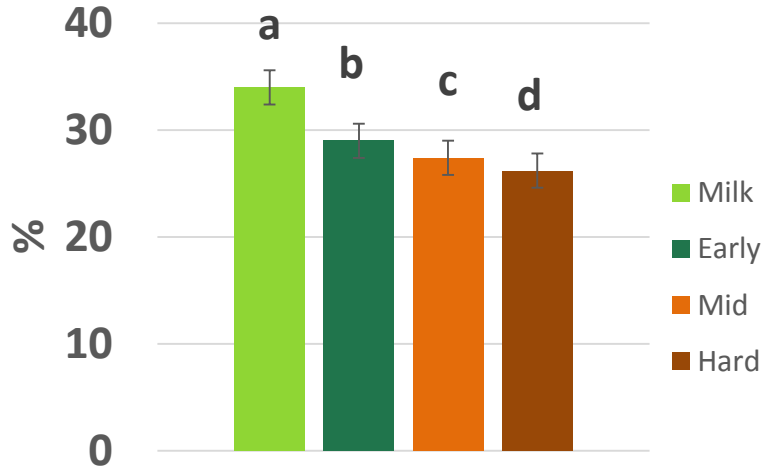
Lignin



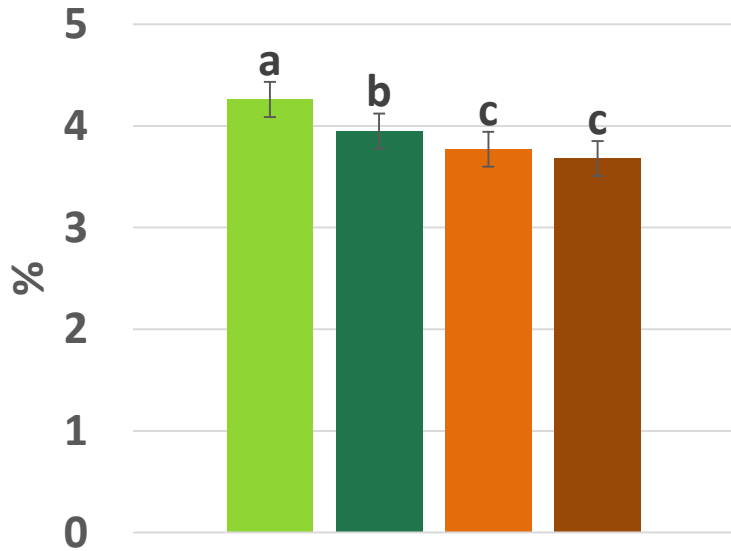
Total digestible nutrients (TDN)

Effect of **variety** of barley forage on chemical composition

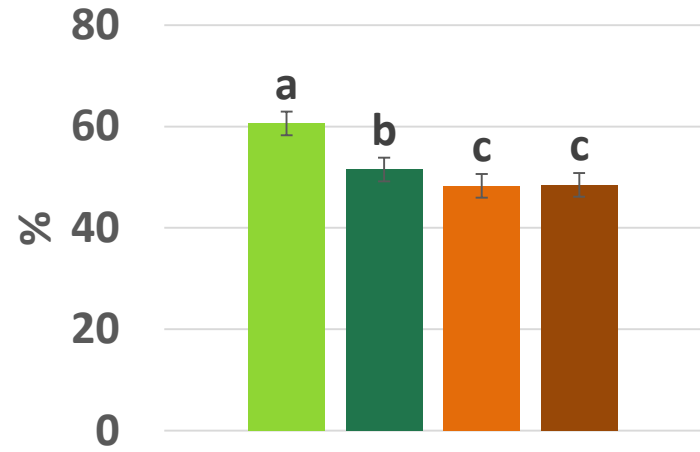




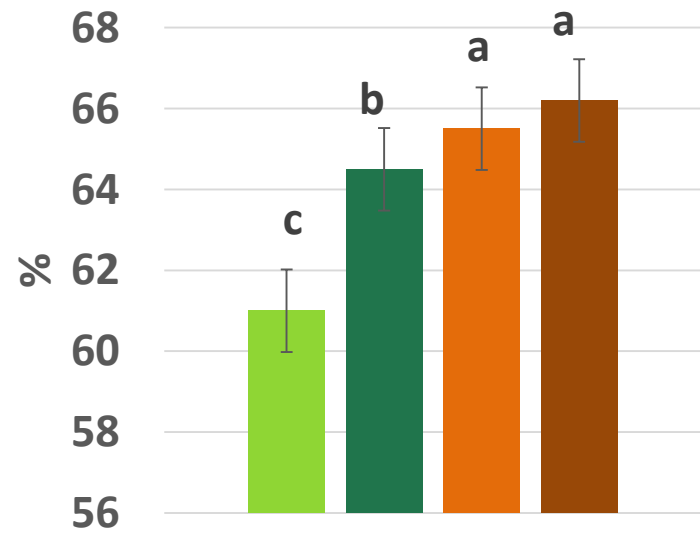
Acid Detergent Fiber



Lignin



Neutral Detergent Fiber

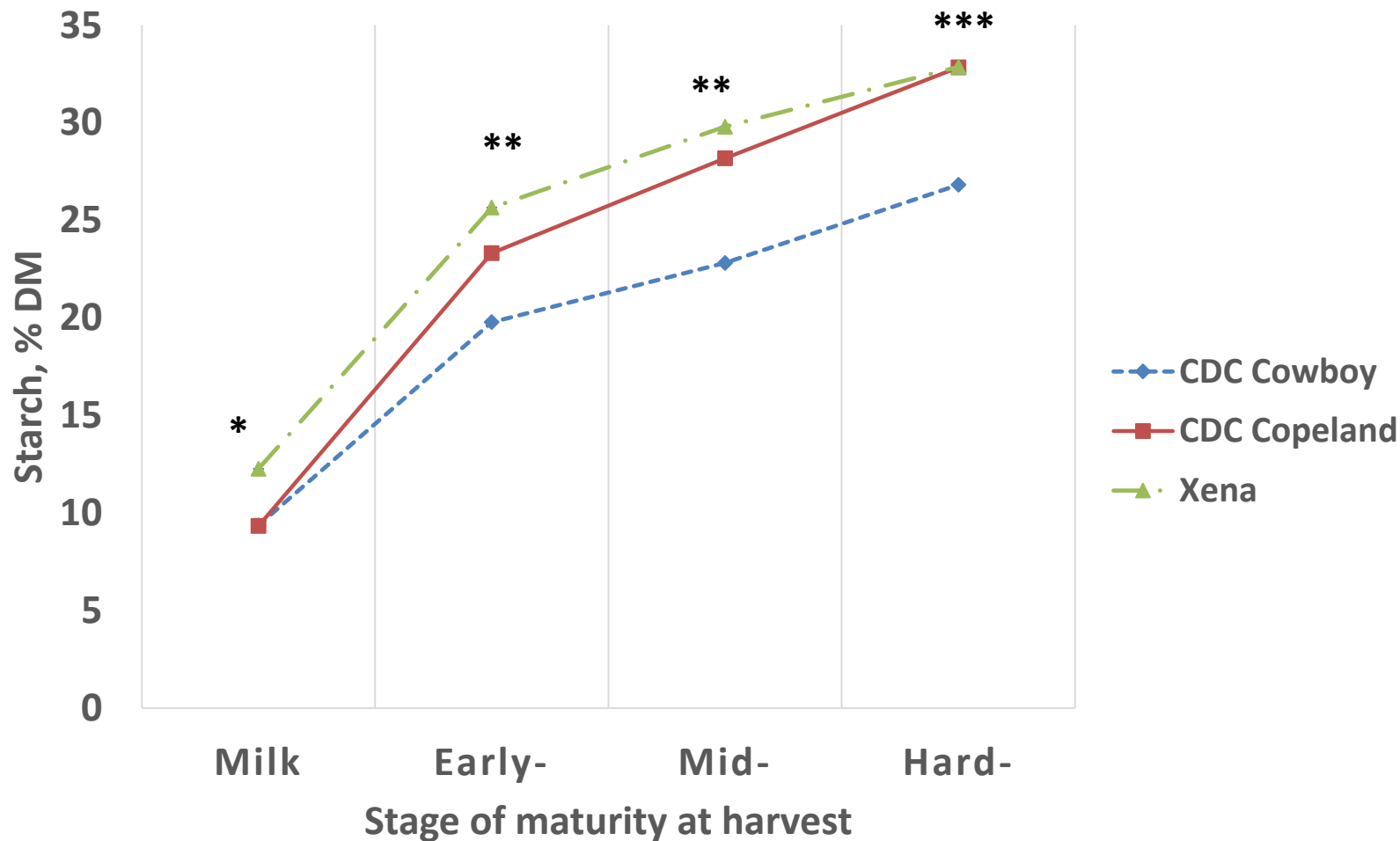


Total Digestible Nutrients (TDN)

Effect of **stage of maturity** of barley forage on chemical composition



Variety × maturity interaction on starch content



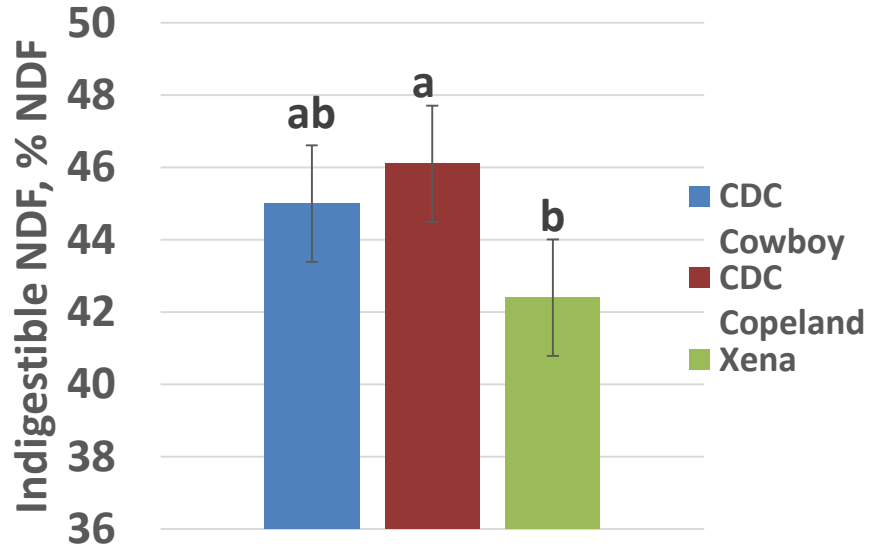
* Indicates Xena > CDC Cowboy = CDC Copeland (P < 0.05)

** Indicates Xena > CDC Cowboy, CDC Copeland intermediate (P < 0.05)

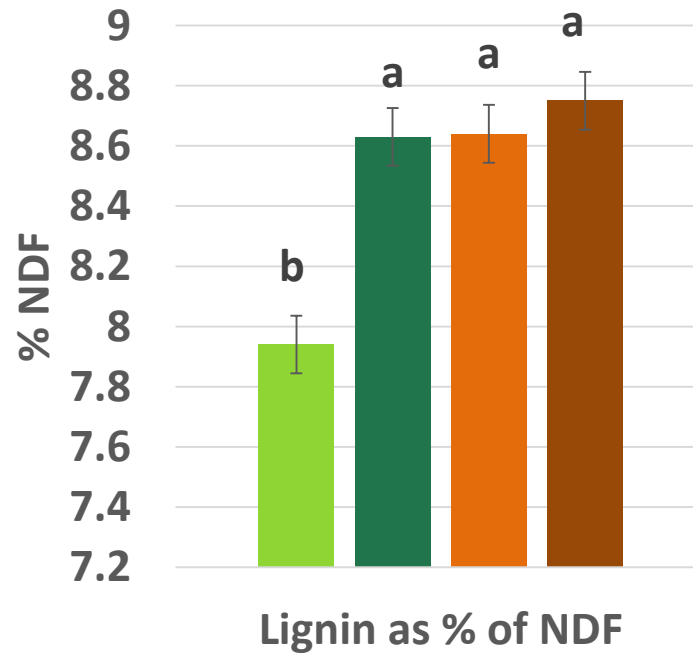
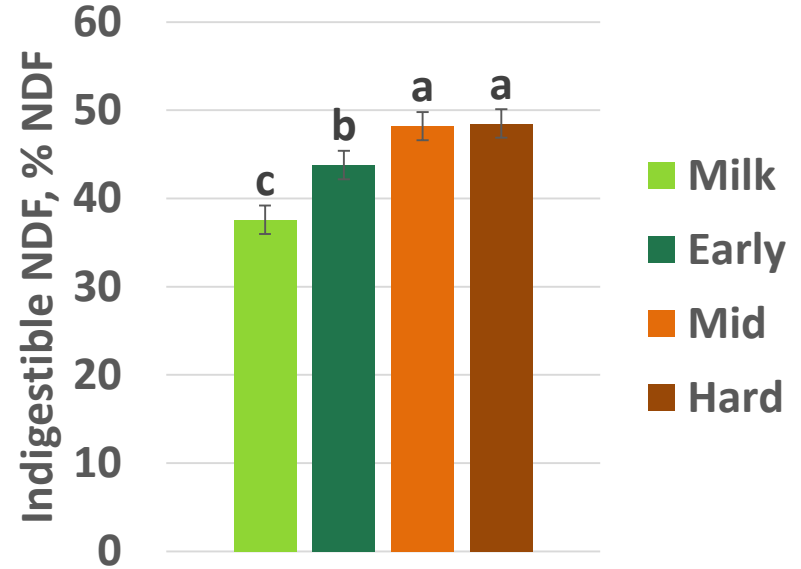
*** Indicates Xena = CDC Copeland > CDC Cowboy (P < 0.05)



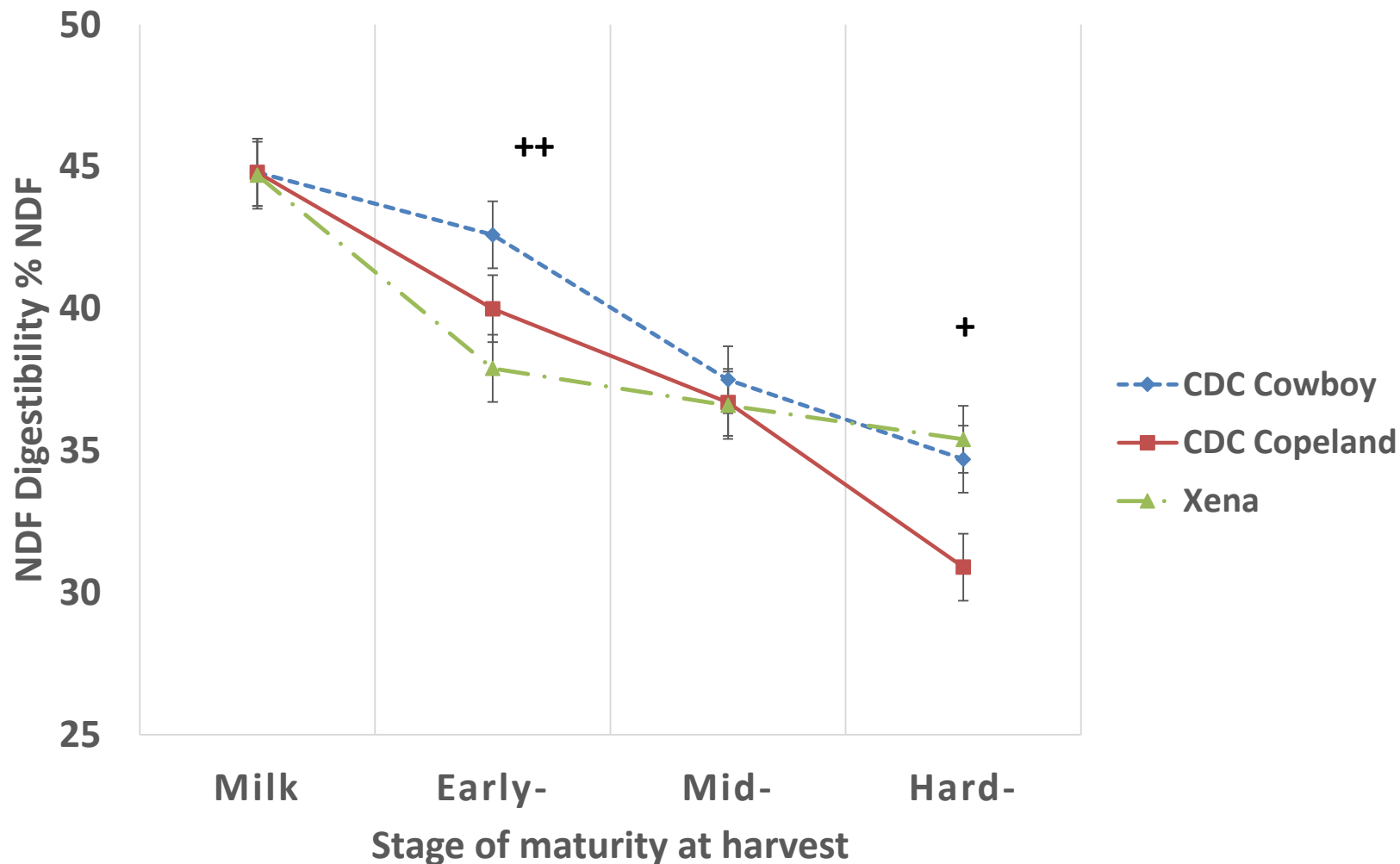
Variety effect



Maturity effect



Variety × maturity interaction on 30h NDFD (% NDF)




+ Indicates CDC cowboy and Xena > CDC Copeland (P < 0.05)

++ Indicates CDC cowboy > Xena, CDC Copeland intermediate (P < 0.05)



Conclusion

- NDF Digestibility (% of NDF basis) varied with advancing maturity as indicated by the $V \times M$ interaction
 - Varieties had similar NDF Digestibility (% of NDF basis) at milk mid-dough stage, varied at early and hard dough stage
 - Greater lignification with advancing maturity decreases the NDF Digestibility
 - Similar NDF Digestibility for the varieties at mid-dough stage indicates that variety effect is minimum when harvested at mid-dough
- 

Conclusion

- Barley varieties vary in terms of changes in starch content and NDF digestibility with advancing maturity
- Variety need to be considered in determining harvest maturity
 - CDC Cowboy at early-dough for dairy
 - CDC Copeland – mid-dough
 - CDC Cowboy and Xena at hard-dough for beef



Acknowledgements

- Saskatchewan Agriculture Development Fund
- Canadian Cattleman's Association
- Saskatchewan Cattleman's Association
- University of Saskatchewan
- Dairy Smart Nutrition
- Cumberland Valley Analytical Services
- Beef and Dairy Producers





Thank
You

