Feed Value of Barley : An update from the Feed Evaluation NIRS project

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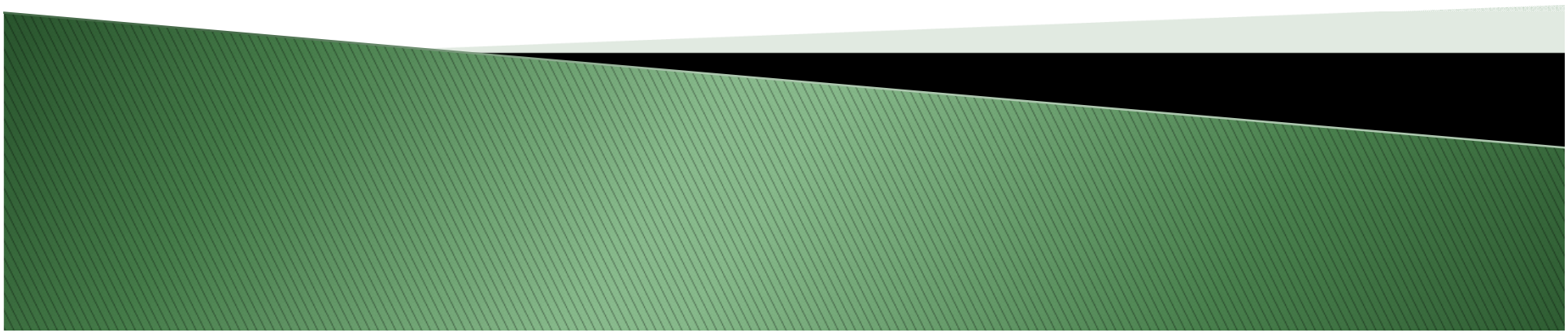
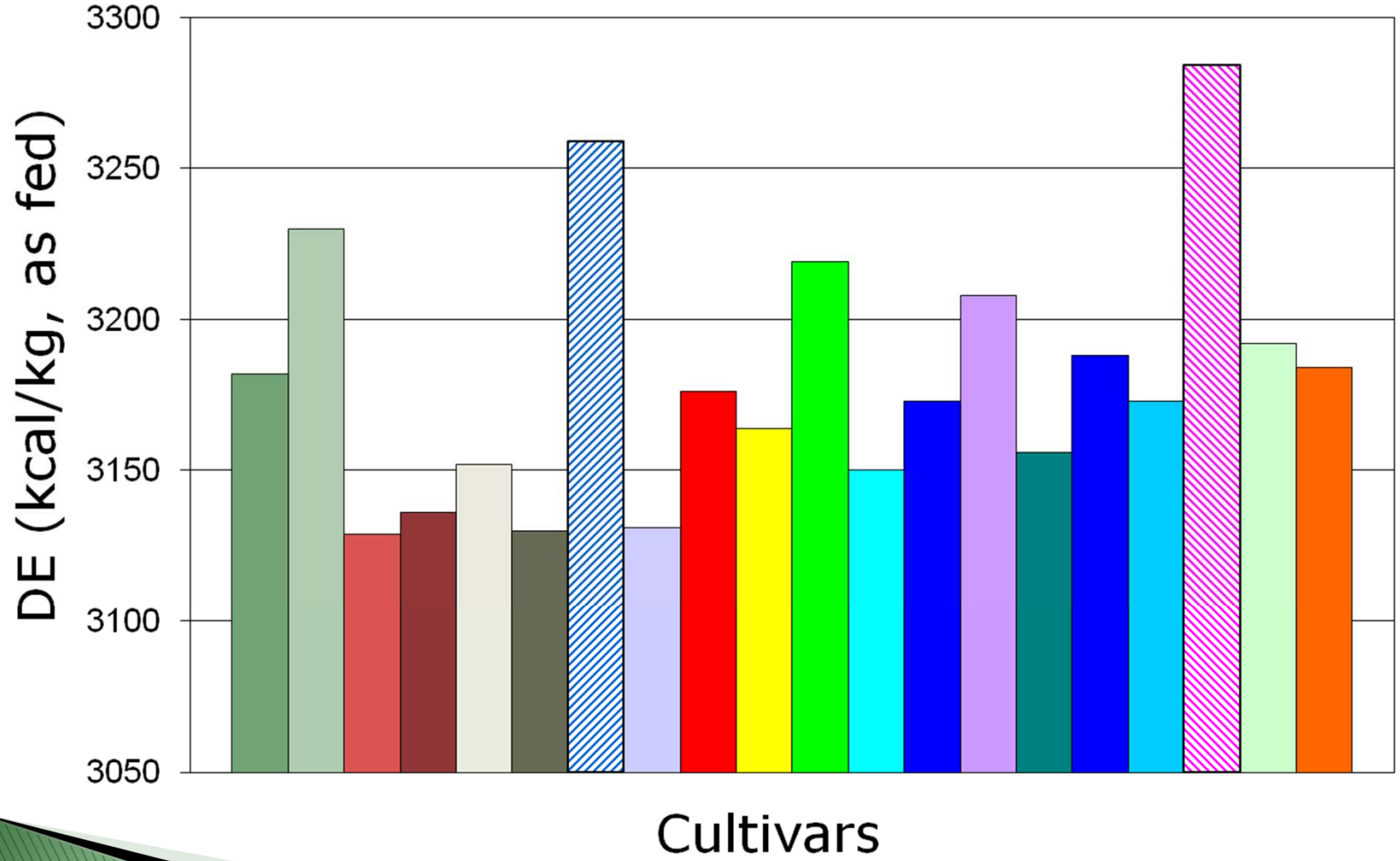


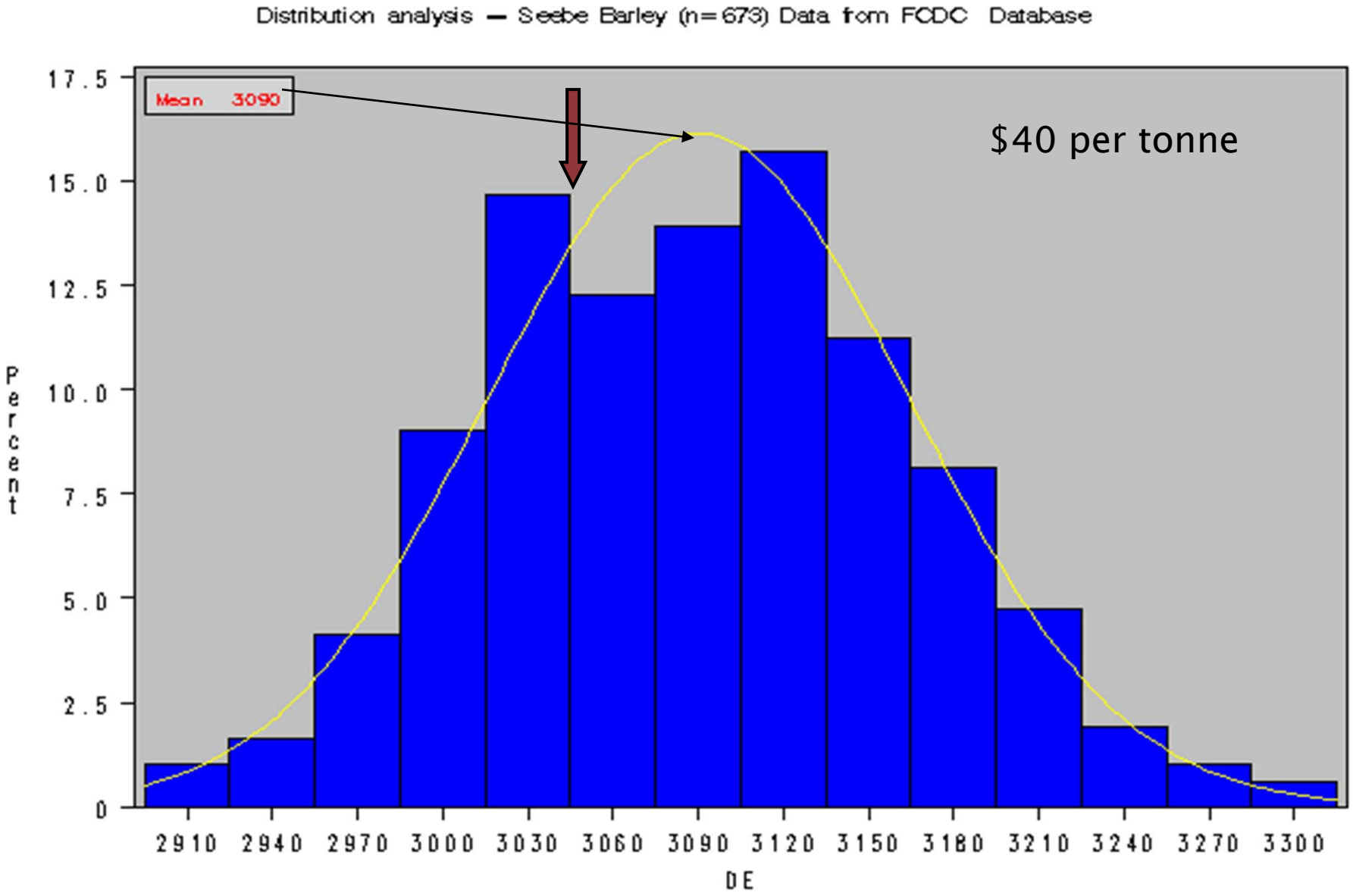
CURRENT SITUATION

- Commodity
  - Not used by malting/food industry
- End users price as commodity
  - energy cost per kg product produced;
- Few wet chemistry laboratories
  - Turnover time, cost, blending
- Book values for nutritional composition

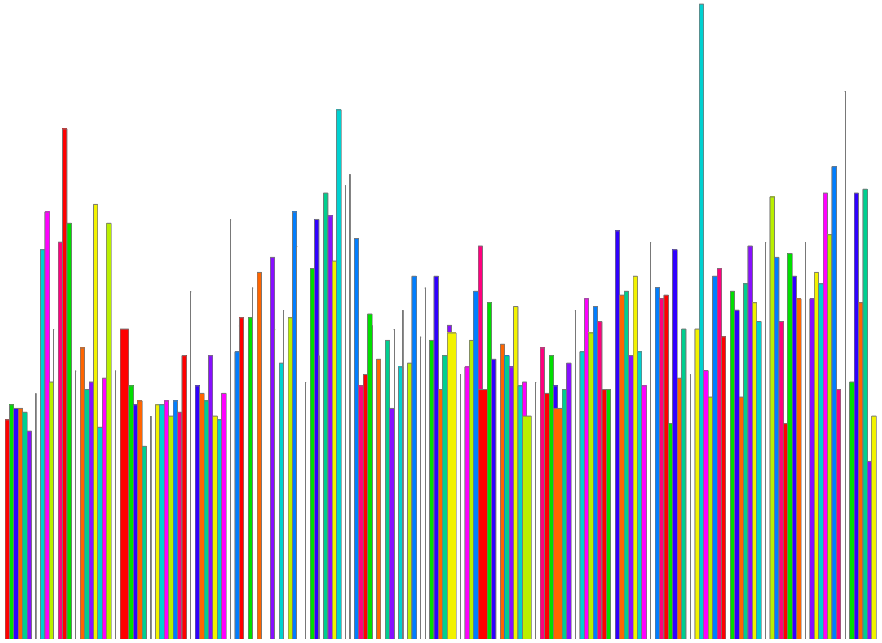
Barley Genotype Differences in Swine DE (kcal/kg) Content



Helm et al., 2000

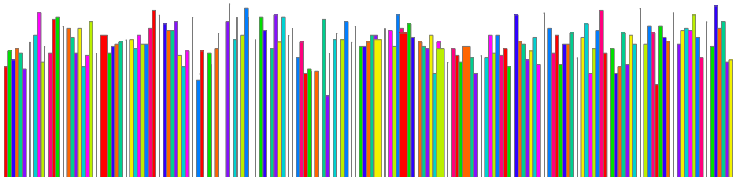

Distribution analysis — Seebe Barley (n=673) Data from FCDC Database
Mean 3090
$40 per tonne
Percent
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0
2910 2940 2970 3000 3030 3060 3090 3120 3150 3180 3210 3240 3270 3300
DE

Variation in Feed:Gain of Broilers fed Diets Containing Hulled Barley



Hulled Barley

*Scale 1.0 to 2.5

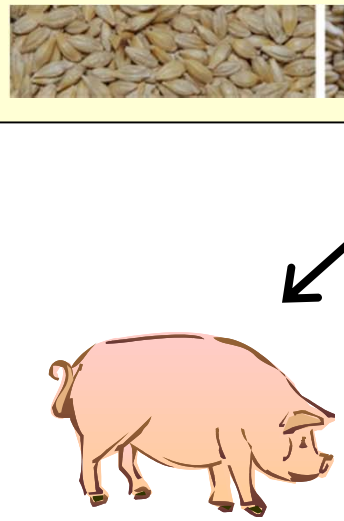


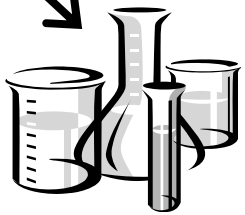
Hulled Barley + Enzyme

Feed Quality Evaluation/NIRS Project

300 Samples each of 6 products

BARLEY | WHEAT | PEAS | CANOLA MEAL | DISTILLERS GRAINS | WHEAT BYPRODUCT





- DE
- NE

- Starch
- Fiber

- AME

- Proximates
- AA
- Physical

Animal (In-vivo) and In-vitro Measurements

What Is the Target?

- DEFINE FEED VALUE!
- Develop robust, timely, inexpensive ways to predict/estimate feed value
- Work with industry leaders to use these predictors of feed value in formulation systems
- Develop rapid method to “estimate the estimate”

Prediction of barley grain feed value for swine using NIRS

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UNIVERSITY OF ALBERTA
QUAECUMQUE VERA

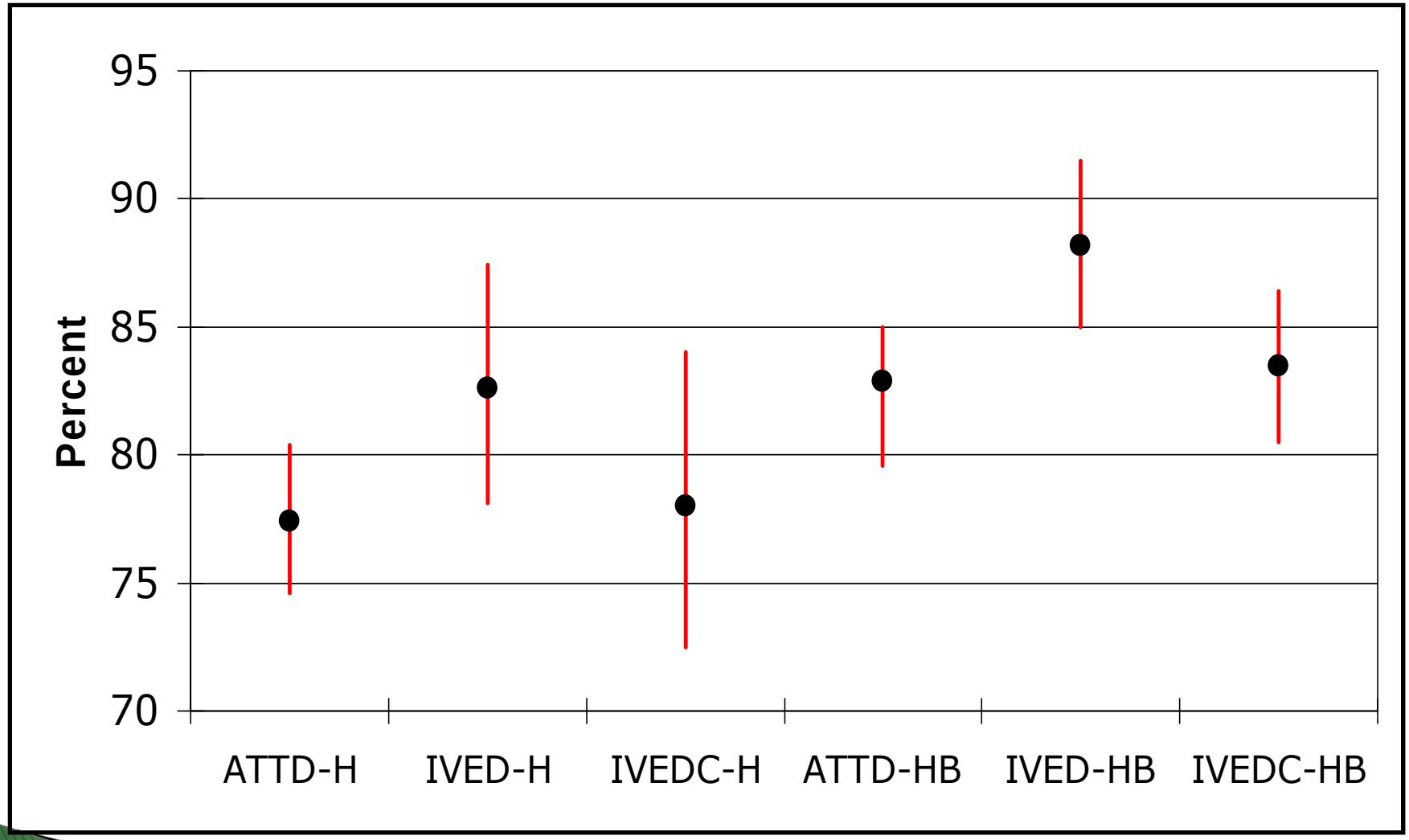
Measurements

- **Apparent Total Tract Digestibility (ATTD) Energy**
  - 39 Hulled (+21)
  - 16 Hulless
  - Barrows (~33 kg)
  - 96% barley diet

- **In-vitro Assay**
  - 3 step enzymatic
  - Pepsin 6 h
  - Pancreatin 18 h
  - Cellulase 24 h
- **Physical, Chemical**
  - TW, KW, % Plump
  - CP, Starch, Lipid, Ash, Dietary Fiber, B-Glucan, Pentosan

(Regmi et al., 2008. JAS 86:2619)

Results – Energy Digestibility

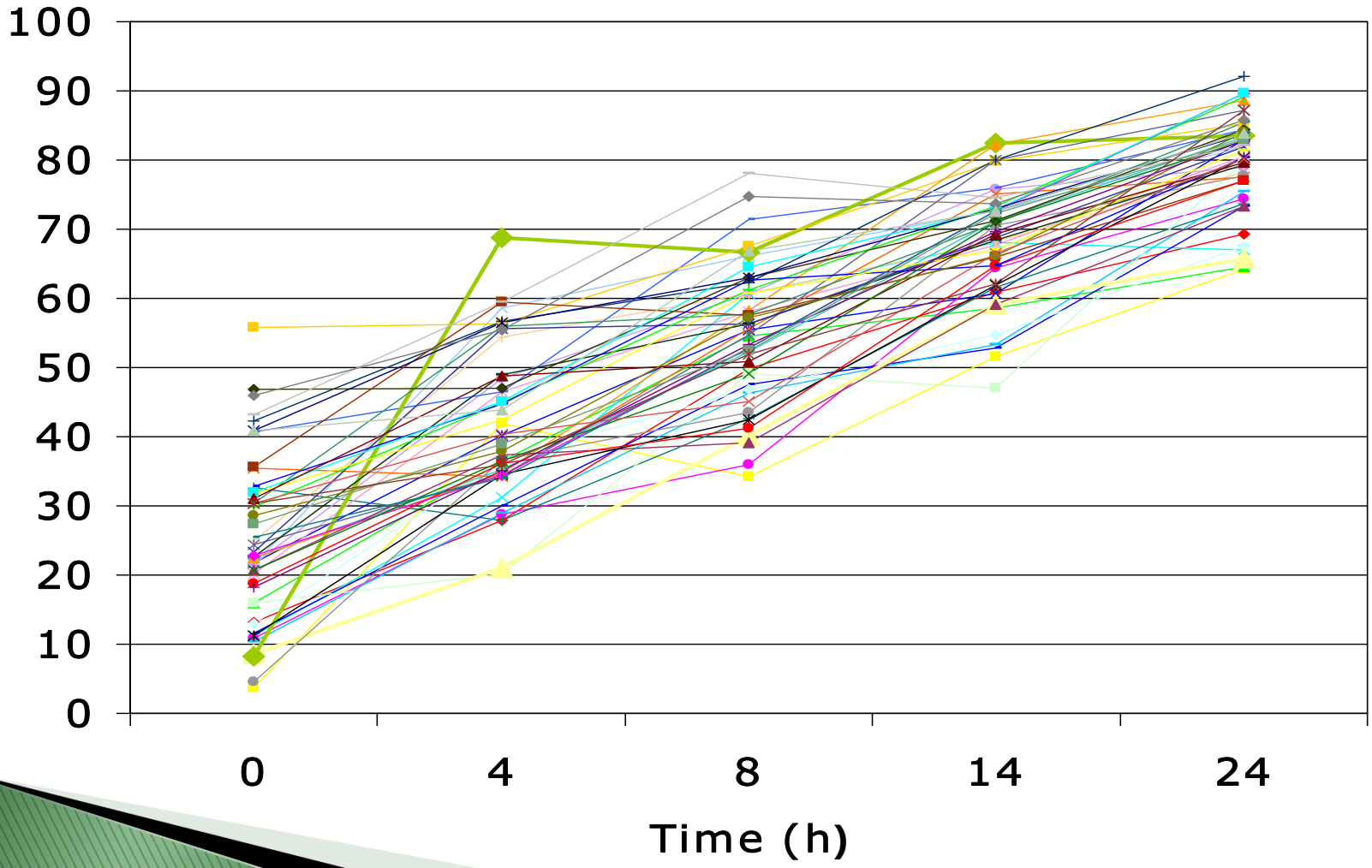


Correction Y=1.23x-25.33 (x=In vitro value)

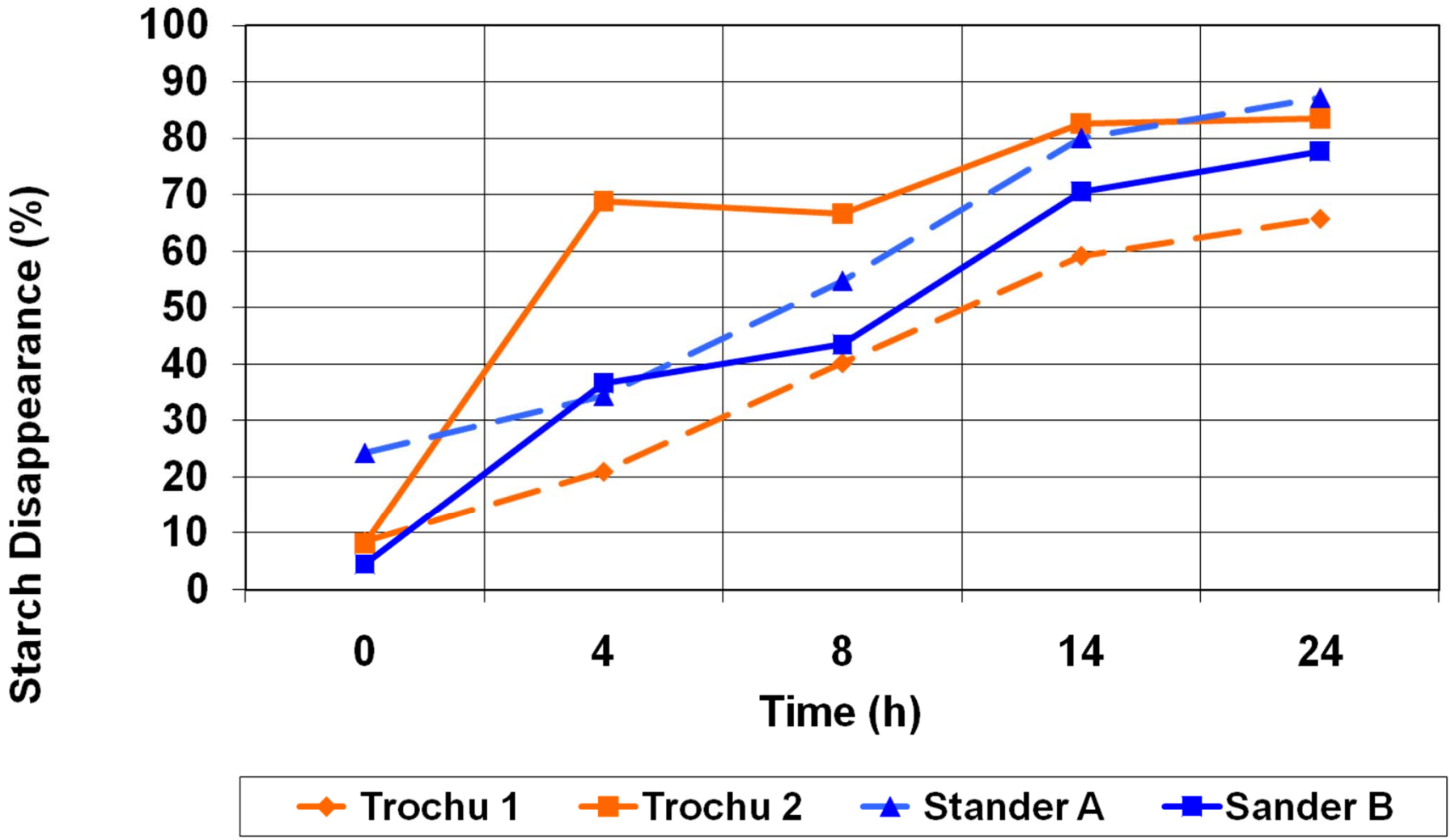
Barley Feed Value - Ruminant

- Physical
  - BW, TW, Plumpness
- Proximates
- Nutrient Degradation
  - Dry Matter (DMD)
  - Starch
  - Fiber (ADF, NDF)

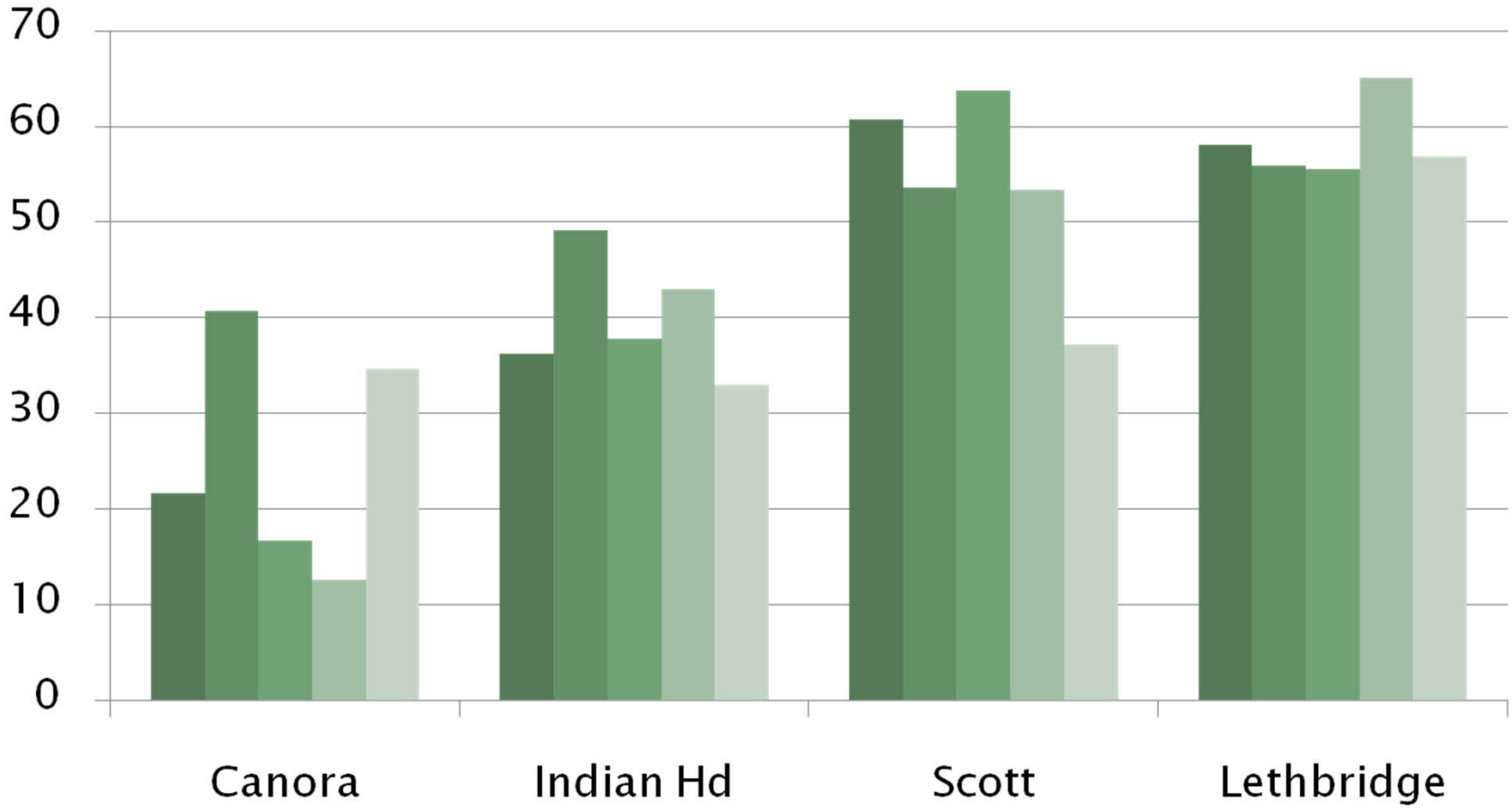
Starch Disappearance In-Situ



Starch Disappearance



Influence of site and N fertilization on 24h ruminal starch disappearance of Metcalfe Barley



Whole plant barley NDF digestibility and its relationship with chemical constituents and DM yield

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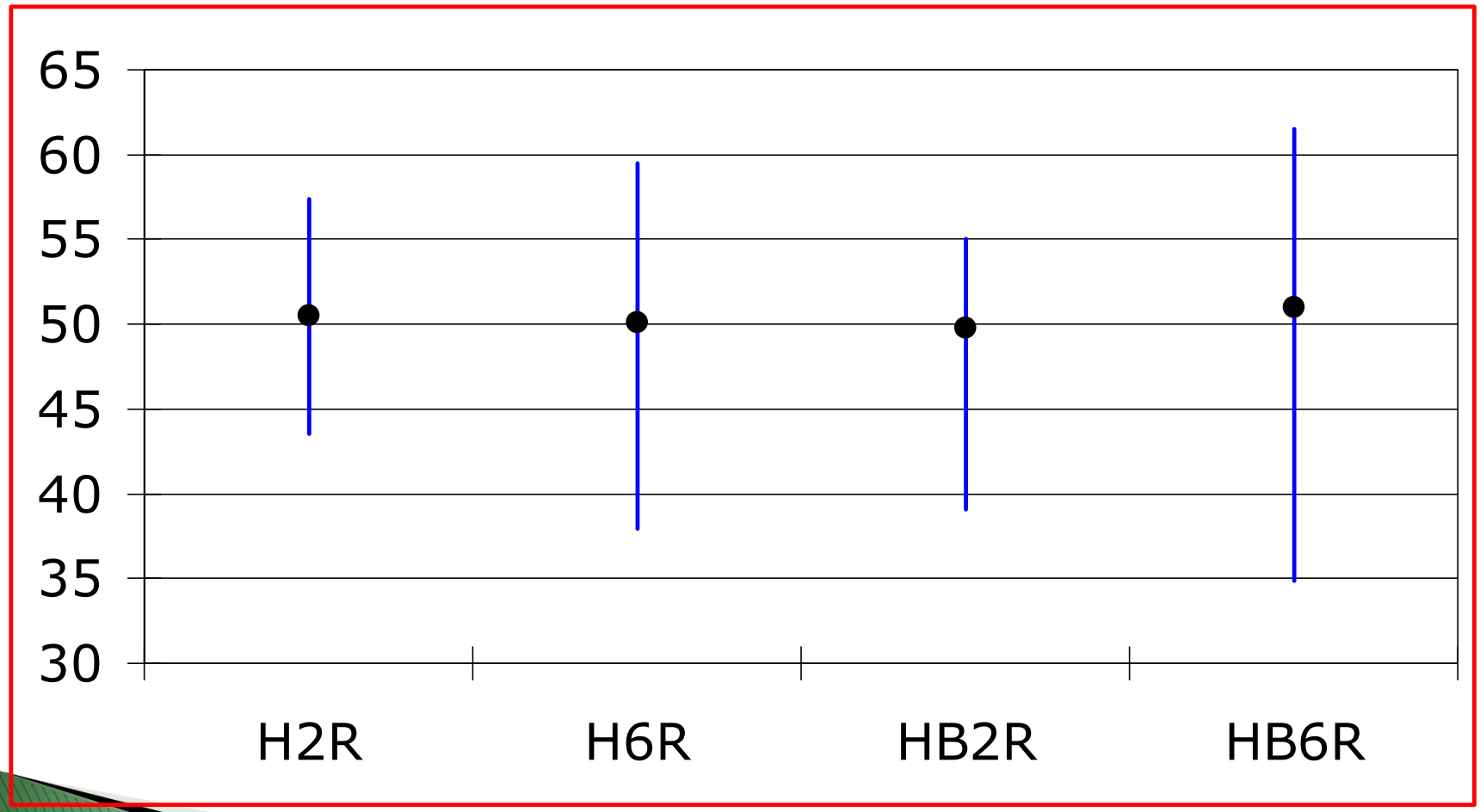
In vitro Fiber Digestibility



Acknowledgements

Alberta Beef Producers

Alberta Barley Commission

Alberta Livestock Industry Development Fund

CIGI

Canadian International Grains Institute
Institut International du Canada pour le Grain

ACIDF

BCRC
Beef Cattle Research Council
A division of the Canadian Cattlemen's Association

BCID Fund
Beef Cattle Industry Development Fund

Government of Alberta

FeedRite

Unity scientific

University of Alberta
Quaecumque Vera