On Farm Feed and Forage Management for a 44,000 Pound Herd Average

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Ever-Green View Farm

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Tom & Gin Kestell

and

Chris & Jennifer Kestell

Introduction to Ever-Green-View.

- Tom and Gin started farming in 1973, bought current farm in 1975
- Son, Chris and his wife, Jennifer are partners in the LLC.
- Milk 85-90 head
- Crop 600 acres

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WHERE DREAMS COME TRUE

Tie Stall Barn with water beds for everyone… cows, dry cows and ALL heifers.

45,400

How was ~~40,000~~ RHA achieved ?

- Genetics
- Forage and feed quality!
- Consistency, consistency, consistency!
- Ventilation for cows and calves, cow comfort, long day lighting.
- Pasteurized milk for young calves.

2018 Production Data (DHI)

Number of milking cows	85	
Milk	133 lb/cow	60 kg/cow
Fat (%)	3.99	
True protein (%)	3.10	
Somatic cell count (1000/ml)	218	
Milk urea nitrogen	9.7	
Days in milk	249	
Rolling Herd Average milk	45,495 lb	20,233 kg
RHA Fat (lb)	1,798 lb	786 kg
RHA Protein (lb)	1,380 lb	626 kg

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Lactation Data

Lactation	Ave Age (months)	Peak Milk	Milk Yield 305 day/ME	Number of cows
1st	26.2	140 lb 64 kg	46,287 lb 20,995 kg	42
2nd	46.0	174 lb 80 kg	44,476 lb 20,174 kg	32
3rd +	74.0	180 lb 82 kg	44,387 lb 20,134 kg	30

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Lactation Profile

November, 2017 monthly DHI data

Lact	Pounds per Day			Kg per Day		
	Early 0-100 d	Mid 101-240 d	Late >240 d	Early 0-100 d	Mid 101-240 d	Late >240 d
1st	132	161	125	60	73	57
2nd	161	153	150	73	69	68
3rd +	160	192	122	73	87	55

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Reproduction

Getting Cows Pregnant

Tom Kestell

Getting cows pregnant

- Voluntary waiting period longer than typical, ~150 DIM
- Services/conception ~2
- Average lactation length on DHI 340 days… flush cows can have lactation lengths up to 600-700 days & maintain 100+ lb/day (45.4+ kg/d)
- Hard breeding and lower genetic merit cows get an embryo with a 65% conception rate

Genetic Considerations

Tom Kestell

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Ever-Green-View My Gold-ET

(5 year scored EX-93, EX-95 udder)

Set a 365-day record

77,480 lbs of milk

1,992 lbs of fat

2,055 lbs of protein

35,144 kg of milk

904 kg of fat

932 kg of protein

MY 1326 is Dam of My-Gold

World Milk Production leader 2008-2015

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Genetics and Genomics

- All animals are genomically tested.
- Heifers are running 2.5 times breed average

	Heifers	Breed Average
Protein	+42	+12
Fat	+59	+18
Milk	+1,240	+294
Productive Life (PL)	5.4	1.8
Total Performance Index (TPI)	+2,406	+1,909

Net Merit of sires of various cow age groups

	Net Merit $ for sires	lbs/day Peak Milk
1st lactation	$567	140
2nd lactation	$497	174
3rd lactation +	$311	180
Breed Average	$68	

Feeding Aspects

Steve Woodford

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Feeding for a 45,000 RHA

- Ration based on consistently good forage
  - Alfalfa haylage: 2 year average 21-25% CP, 34-39% NDF, 150-200 RVV
  - Corn silage: Has fed BMR corn silage for 10+ years
  - High Moisture Corn: Harvested at 27% moisture
    - HM corn stored in Harvestore silo.
  - For 2016 and 2017 went to high chop BMR corn silage
    - 2 year average 31-35% NDF, 40-41% starch, 64-70 % NDFD 30 hour
    - This years BMR has 44% starch.

Feeding the cows for optimum production

- With forages we have, ration runs 60-70% forage.
- Before high chop BMR corn silage fed, dry matter intake 60-64 lb (27.2-29 kg)
- Last two years with high chop BMR corn silage dry matter intake 66-67 lb (29.9-30.4 kg)
- Milk production has remained at just better than 2 lb of milk per lb of dry matter.
- Only 8-10 lbs (3.6-4.5 kg) DM of HM corn fed/head/day

Building ration for Ever-Green-View

- Really not any different than other clients
  - Typically ration is
    - 16% protein
    - 27-29% NDF
    - 5% fat
  - Ration based on HM corn, haylage, corn silage
  - Corn silage usually about 55-60% of forage DM

Feed	D.M. (lb)	As-Fed (lb)	D.M. (%)	D.M. (kg)	As-Fed (kg)	$/Cow/ Day	$/Ton
Haylage	17.0	38.7	44.0	7.7	17.6	1.26	65
Non BMR CS	10.8	28.5	38.0	4.9	12.9	0.54	38
BMR Corn Silage	10.8	27.9	38.8	4.9	12.7	0.53	38
H.M. Corn	10.9	15.5	72.5	4.9	7.0	0.75	100
Protein Mix	9.7	10.6	91.7	4.4	4.8	2.75	519
Baleage	2.0	4.0	50.0	0.9	1.8	0.25	125
Sugar	1.9	3.0	62.0	0.9	1.4	0.32	214
Roasted Soybeans	2.85	3.0	95.0	1.3	1.4	0.73	486
Totals	66.0	130.7	50.5	29.9	59.3	$7.13	

TMR Nutrient Profile

Nutrient	Units	Level
Dry Matter	% of total	50.5
Crude protein	% DM	16.08
RUP	% of CP	33.9
ADF	% DM	19.5
NDF	% DM	26.8
Forage	% DM	63.7
Forage NDF	% DM	22.3
Starch	% DM	28.5
Sugar	% DM	3.6
Fat/oil	% DM	5.1

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TMR Nutrient Profile

Nutrient	Units	Level
Calcium	% DM	0.90 (270 grams)
Phosphorous	% DM	0.36 (109 grams)
Potassium	% DM	1.56 (466 grams)
Magnesium	% DM	0.30 (90 grams)
Sulfur	% DM	0.30 (90 grams)
Sodium	% DM	0.34 (101 grams)
Selenium	ppm	0.33 (9.8 mg)
Vitamin E	IU / lb	8.0 (500 IU)

Protein Mix

Feed Ingredient	Percent of Mix
Canola meal (38%)	18.8
Fuzzy cottonseed	15.1
Roasted soybeans	14.1
Soybean meal (48%)	9.4
Ground shelled corn	9.4
Energy Booster 100	4.7
Molasses	0.9
Salt	1.9
Sodium bicarb	3.3

Feed Additives

- Yeast product
- Rumensin
- Organic: Chelated chromium, Selenium, and Trace minerals
- Biotin
- Sodium bicarbonate
- Beta carotene
- Check for mycotoxin and add a binder

Forage Quality

Tom Kestell & Steve Woodford

Forage Quality is Critical

Hybrid alfalfa has be been used since it was developed by DLS.

This field won the World Super Bowl Contest 2x’s at World Dairy Expo.

Forage Strategies at Ever-Green-View

- Consistent, palatable forages
- Have 6 silos for forage & baleage so forage allocation very flexible.
- Very rarely have haylage RFV over 200.
- Does not want to feed straw to dilute out very low fiber forage due to toxin concerns.
- Avoiding rained on forage…ALWAYS!!
- Consider low lignin alfalfa in future?

Alfalfa Haylage

	% DM basis
Dry matter	48.3
Crude protein	21.7
ADF	29.3
aNDFom	34.2
Sugar	4.2
RFQ	187
uNDFom	16.8
	% NDF
NDFD—30	51.0
NDFD—240	58.9

BMR Corn Silage

	% DM basis
Dry matter	38.8
Crude protein	7.1
ADF	19.3
aNDFom	30.9
Starch	44.2
TDN—1x	74.4
uNDFom	8.9
	% NDF
NDFD—30	63.8
NDFD—240	70.9


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Forage Strategies for Heifers

- A combination of stored shredded corn stalks (from previous year) mixed with 1st or 2nd crop freshly cut alfalfa makes excellent heifer forage.
- This mixture provides plenty of fiber and yet enough protein.
- Once these 2 forages are chopped together, there is 0 (ZERO) waste and very little sorting.

Corn Stubble

	% DM basis
Dry matter	18.96
Adjusted CP	3.17
ADF	44.61
aNDF	67.05
Starch	3.11
TDN-1x	56.61
NFC	22.18
Calcium	0.27
Phosphorus	0.09
Potassium	1.40


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Ration Observations

- Ration models not accurate
- High levels of fat feeding not required
- Is it possible for forage to be “too good”, meaning too low in fiber. Not so far.
- Goal is to maximize rumen fermentation
  - Example, for 140lb tank average and 3.9% fat, cows are producing 5.4 lbs butterfat/day, or .23 pounds butterfat/hour.
  - Ration at 5.1% fat supplies 3.3 pounds fat, so rest is from rumen VFA

- Much easier to add energy than replace low NDFD
- Current ration 21 pounds corn silage DM fed.
- Dilution is only option.

Current ration run through NDS ration model

	% of requirement
ME Mcal/d	81
MP g/d	80
Met, g/d	76
Lys, g/d	78

- Milk components a sensitive indicator of ration performance.

- There is no downside of higher NDFD.

When selecting for high genetic merit are we also selecting by default for higher biological efficiency?

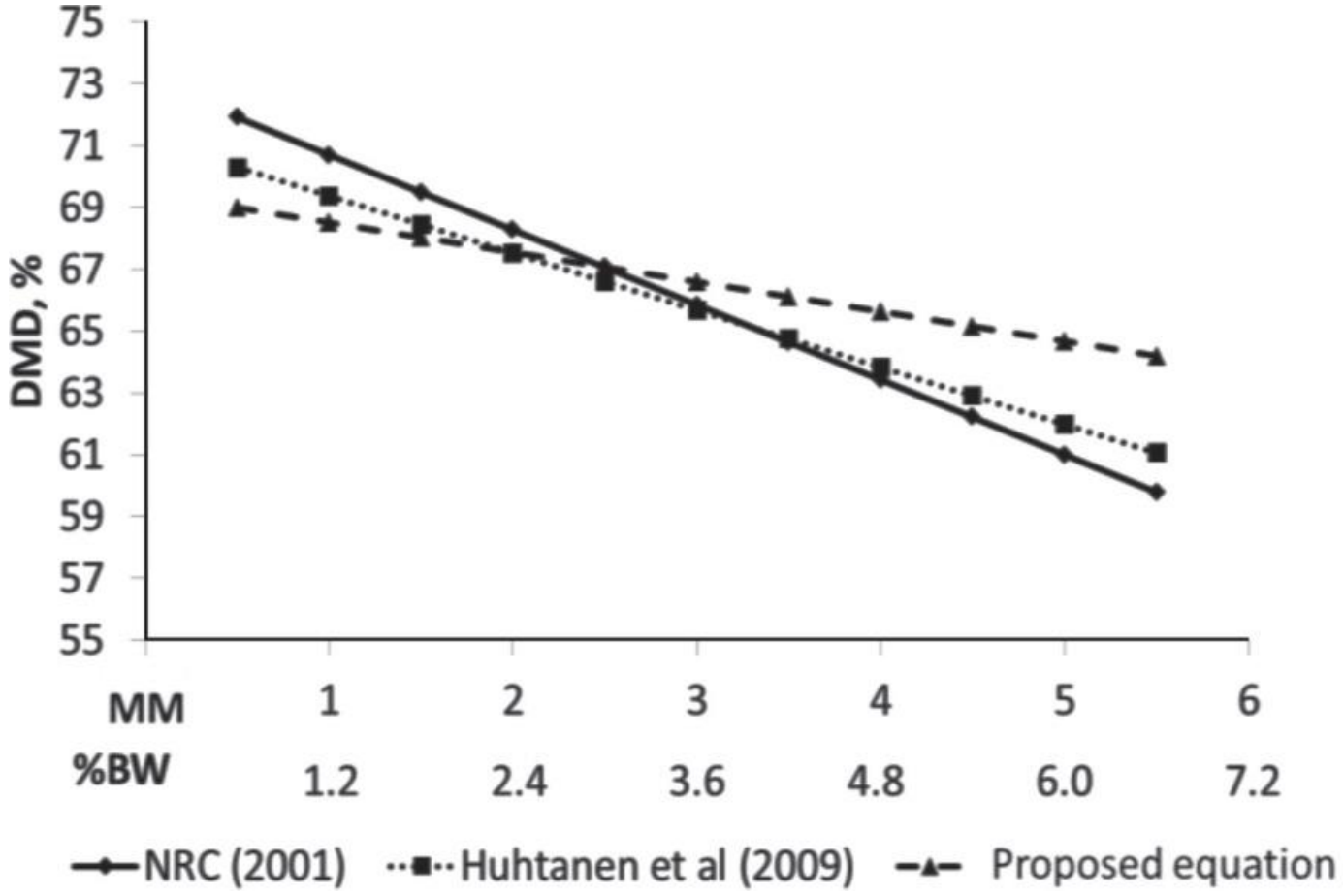
Predicting Nutrient Digestibility

De Souza et al, 2018

- 54 studies over last 15 years, Holsteins
- 1942 observations from 662 cows on 195 different treatments.
- Milk production: 42 lbs to 127 lbs
- DMI: 26 lbs to 68lbs

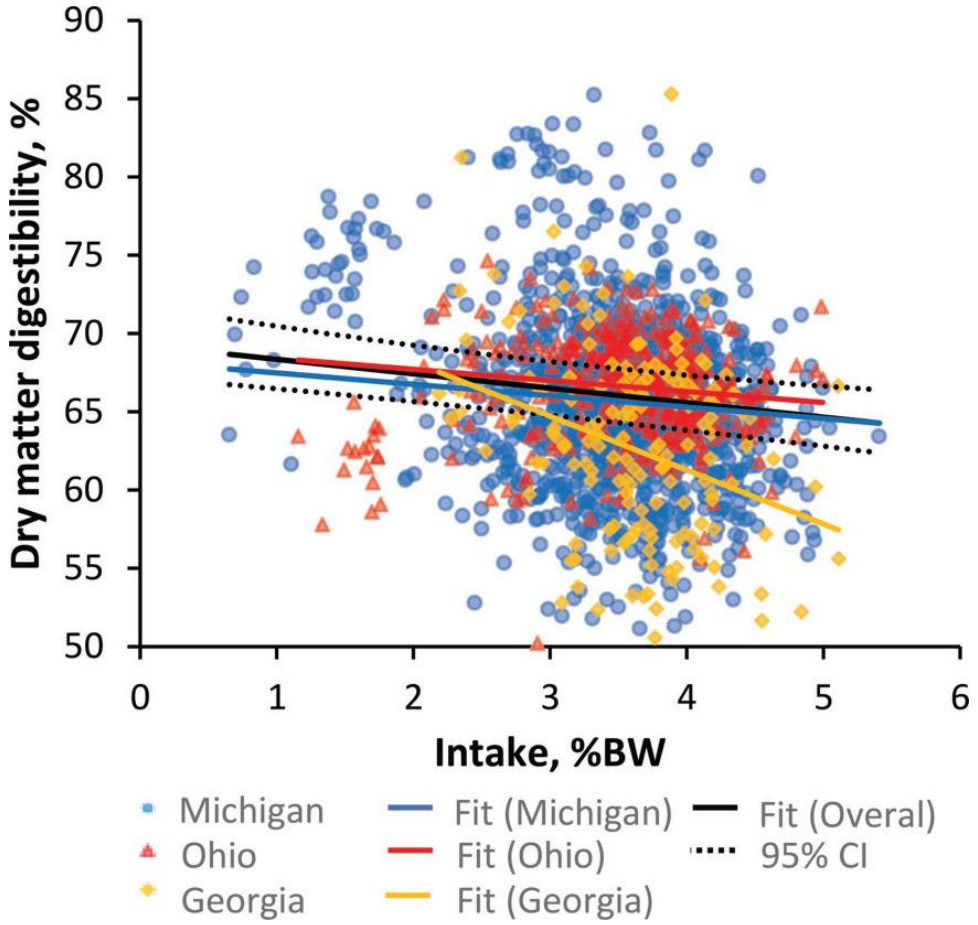
Dry matter digestibility

De Souza et al, 2018



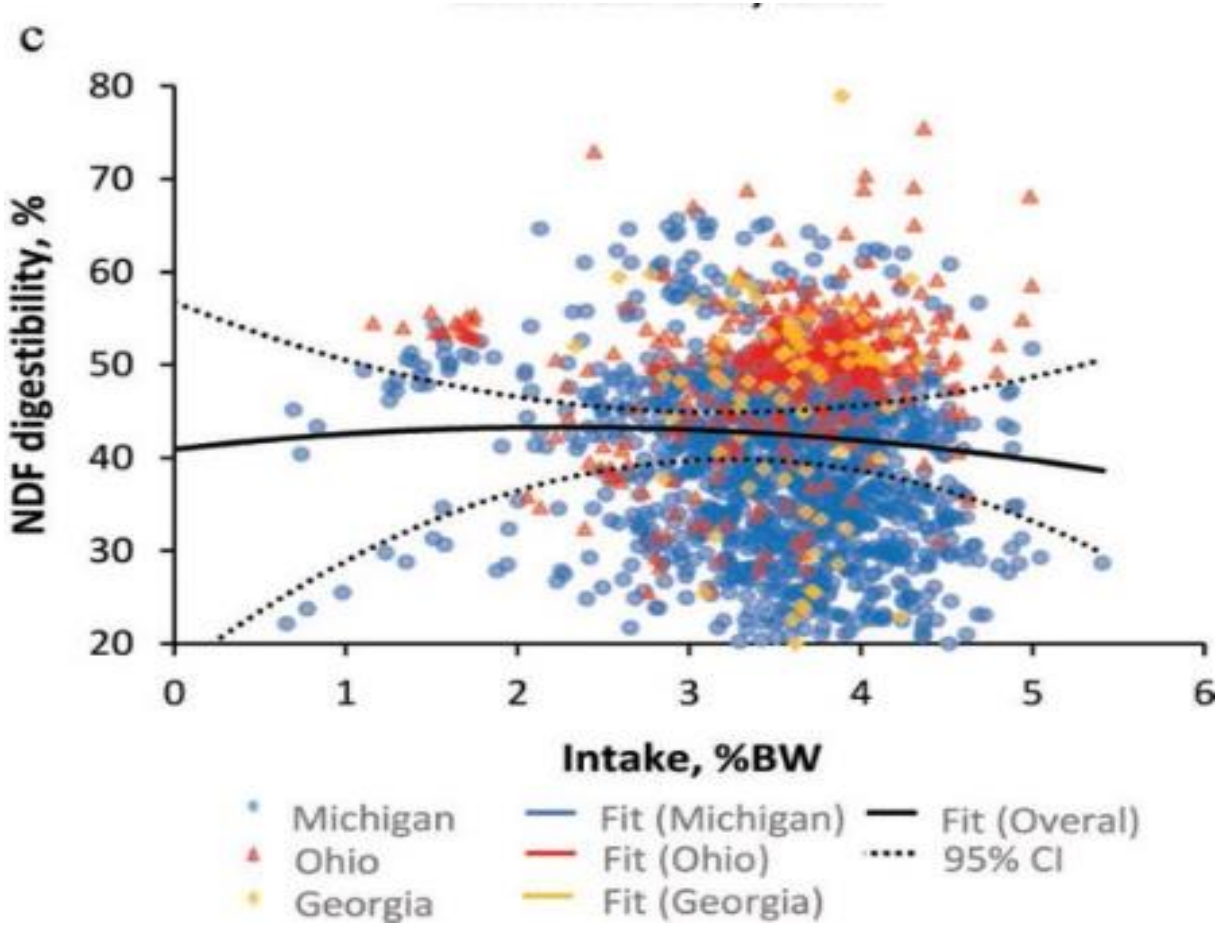
Intake affect on Digestibility

De Souza et al, 2018



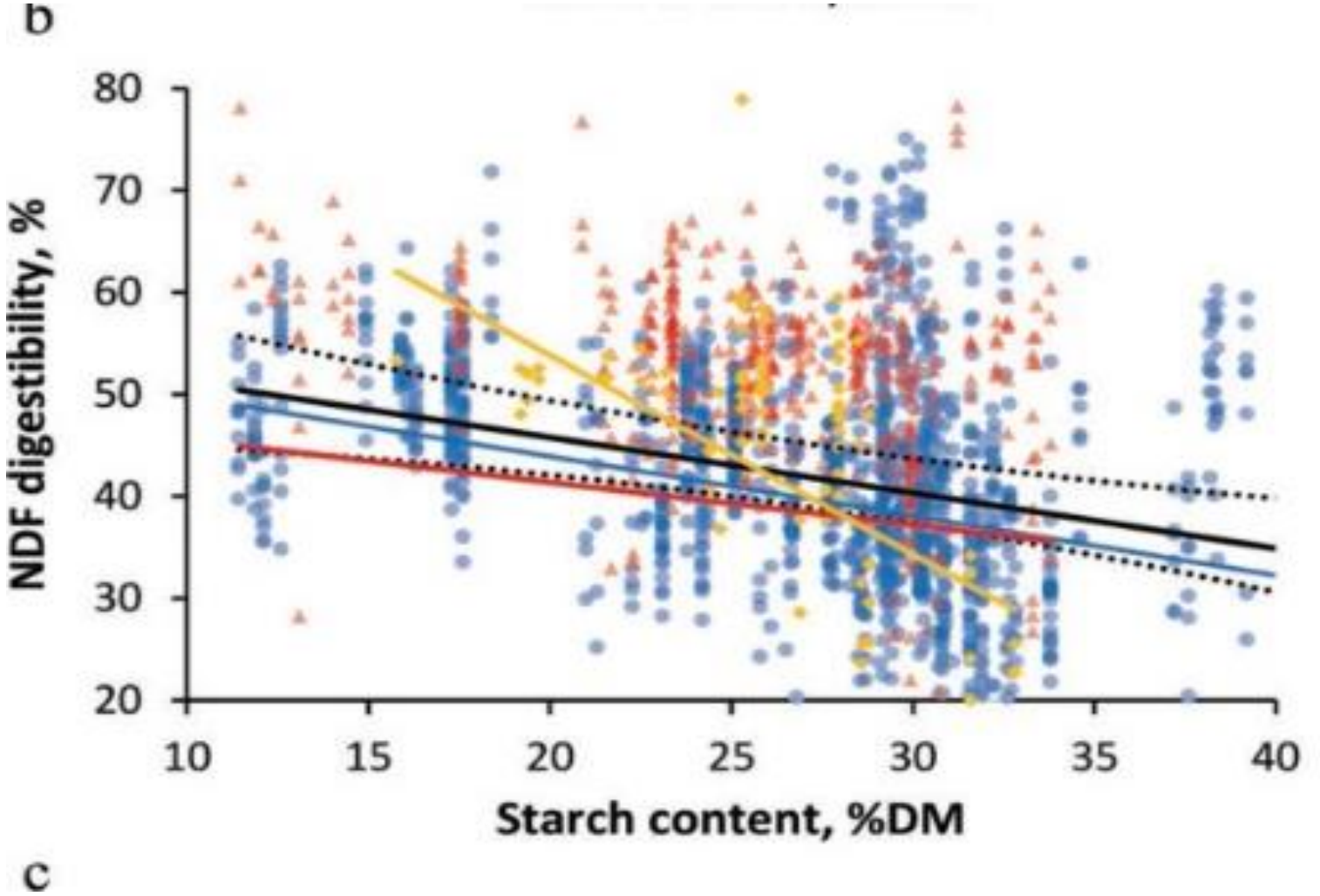
NDF Digestibility

De Souza et al, 2018



Starch affect on NDFD

De Souza et al, 2018



Survey of Wisconsin Dairy farms

Shaver 2017

- Selected herds in WI with milk>29,800 lbs
- On average rations 63% forage
- % dietary nutrients provided by forage

  Fiber >75%

  Protein 45%

  Energy 50%

  Starch 40%

  Kestells ration energy from forage 55-60%

When selecting for high genetic merit are we also selecting by default for higher biological efficiency?

Probably, study showed that 9-31% of residual feed intake due to digestibility.

Potts et al, 2017

Example:Nitrogen Efficiency

- Research states maximum theoretical nitrogen efficiency is 43%
- The average herd is 20-35% nitrogen efficient
- Ever-Green View herd is 40% nitrogen efficient
- My-Gold, assuming a 70 lb DMI, is 50% N efficient, she would have to have consumed 80 pounds dry matter to get down to 43% nitrogen efficiency.

UW Research

- Selected high and low efficiency cows.
- Swapped rumen contents with each pair of cows.
- By 10 days post rumen content swap, rumen bacterial community returns to resemble that of the host cow rather than the donor cow.
- Suggests a significant part of feed efficiency is from the rumen.

Conclusion

Based on this one herd example, majority of milk and milk production gains have been from genetics, not ration quality

Challenge is therefore to improve ration quality to keep pace with genetics.

Ever-Green View RHA in January 2013 was 38,400, so increasing by about 1200 lb/year

What type of forage quality will we need in another 5 years? RHA 50,000??