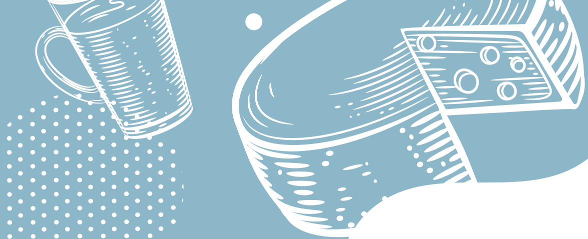

2022 Hybrid Illinois Dairy Summit

OPPORTUNITIES LEARNED IN MANAGING DAIRY COWS DURING COVID

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12th Annual Illinois Dairy Summit hosted by Illinois Milk Producers Association and University of Illinois Dairy Extension

2022
Hybrid Illinois Dairy Summit

OPPORTUNITIES LEARNED IN MANAGING DAIRY COWS DURING COVID

AGENDA

11:00am **Welcome**

Feed Focus in 2022: NRC 2021 and Maintaining Profitability

Mike Hutjens, *Ph.D., UIUC Dairy Specialist, emeritus*

11:50am **Evaluating Cow Value**

Derek Nolan, *Ph.D., Teaching Assistant Professor, University of Illinois*

12:30pm **Lunch & Booth Visits**

1:30pm **Producer Panel: What Worked and What Didn't During the COVID Pandemic**

Scott Brenner, ***Hunter Havens Farm,*** Carroll County
John Lawfer, ***Lawfers' Willow Valley Dairy Farm,*** Stephenson County
Aaron Mitchell, ***Mitchell Dairy and Grain LLC,*** Winnebago County

2:20pm **Q & A**

2:45pm **Wrap Up & Adjourn**

ALSO PROVIDED VIRTUALLY: Wheat Silage as an Alternative for the Dry Cow Diet
Phil Cardoso, *DVM, Ph.D., University of Illinois*

PLEASE FILL OUT OUR EVALUATION. Your feedback will help us navigate next year's Summit. https://bit.ly/DSsurvey22

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SPEAKERS
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Phil Cardoso, DVM, Ph.D.

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Phil is an associate professor at the University of Illinois at Urbana-Champaign. He received his D.V.M., and M.S. degrees from the Universidade Federal Do Rio Grande do Sul in Brazil, and his Ph.D. from the University of Illinois. Since 2012, Cardoso has established a unique program that seamlessly blends his teaching, extension, and research efforts. Phil and his students have published over 75 peer-reviewed manuscripts (original research and invited reviews) and 3 invited book chapters to date.

Mike Hutjens, Ph.D.

UIUC Dairy Specialist, Emeritus
hutjensm@illinois.edu

Mike was raised on a Holstein farm near Green Bay, Wisconsin. He has graduate degrees from the University of Wisconsin, Madison. Since 1979, he has been a member of the University of Illinois Animal Sciences Departments as extension dairy specialist. He has spoken at more than 60 meetings and conferences in 46 states, 17 foreign countries, and nine Canadian provinces.

Derek Nolan, Ph.D.

University of Illinois
dtnolan@illinois.edu

Derek grew up on a dairy farm in Northeast Iowa. His passion for agriculture led him to Iowa State University where he earned his degree in Dairy Science. Derek completed both his Master's and Ph.D. at University of Kentucky with a research focus in milk quality and decision economics. Derek is now a Teaching Assistant Professor and Dairy Extension Specialist in the Animal Sciences Department at the University of Illinois.

MEET OUR DAIRY FARMER PANEL

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Mike Hutjens, Ph.D.
UIUC Dairy Specialist, emeritus

Feed Focus in 2022: Maintaining Profitability and 2021 Dairy NRC

Today's Program

- Economic status and definitions
- Focus on feed costs and solutions
- New Dairy NRC 2021 has arrived; so now what?

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Economic Outlook
Can You Be Profitable in 2022?

$$$

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Current Budget Factors

Adapted from Nietzke and Faupel, Jan. to June, 2021

Milk yield: 83 pounds per cow

Days in milk: 181 days

Milk Income: $17.79

Breakeven milk price: $16.94 (79 lb milk)

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Cost Breakdown (Per Cwt)

Feed costs:	$9.28
Cull cow expenses:	$2.55
Labor:	$1.77
Milk hauling:	$1.01
Repairs and maintenance:	$0.49
Health:	$0.42

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Higher Costs In 2022 (Guilke Group)

- Diesel: Up 60%
- Gas: Up 50%
- Used trucks: Up 26%
- Labor: Up 10 to 20%

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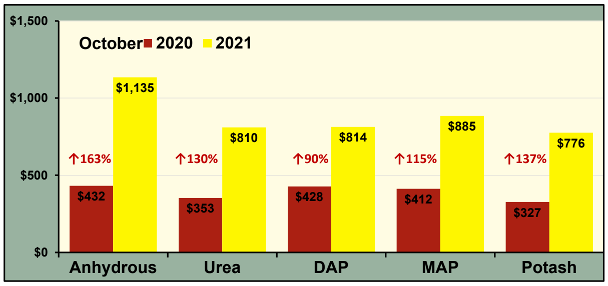
Fertilizer Prices Have Soared



Source: USDA Illinois Production Cost Report

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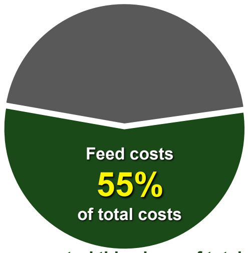
Economic Definitions for Today

Cost of Production



- Making feed decisions "**show me the money**"
- Only reason to raise livestock is to increase my return on crops raised on the farm

Farmers control this phase of total costs

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2021 Illinois DHI Breed Averages

	Holstein	Jersey
Number of herds	170	16
Herd size	188	220
Milk (average lb)	23,985	15,502
(weighed)	26,542	17,903
Milk fat (%)	3.93	4.98
Milk protein (%)	3.13	3.36

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2021 Illinois DHI High Breed Average

	Cows	Milk (lb)	Fat (%)	Protein (%)
Koester	431	37,581	4.2	3.1
Kasbergen	3752	33,299	3.8	3.1
Fay-Bla	638	32,398	3.9	3.1
S & B	604	32,398	3.9	3.0
Bohnert	602	21,614	5.1	3.7
Clover	1467	19,472	4.8	3.7

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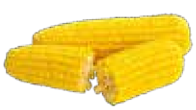
Changing Feed Costs

$6.10/bushel

Was over $6.00/bushel

$3.10/bushel



$405/ton

$300/ton

Soybean Meal

Remain High

$244/ton

By-product feeds follow corn and soybean meal prices

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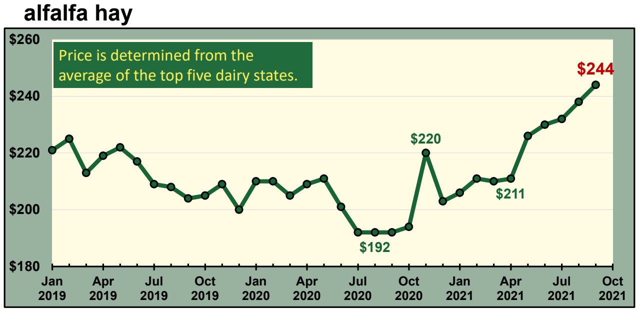
Monthly per ton price for Supreme & Premium quality alfalfa hay



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USDA Predicted Grain Prices in 2022

- Shelled corn $4.80 / bushel ($5.45)
- Soybeans $10.50 / bushel ($12.10)
- Wheat $6.50 / bushel ($6.50)
- Oats $3.70 / bushel ($3.30)

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USDA Predicted Milk Prices in 2022

- All milk price: $22+ per cwt
- Wild cards
  - U.S cow numbers down, but….
  - Milk yield down (3% to under 2021 levels)
  - Exporting17.5 percent of U.S. milk solids
    - Will Covid reduce this impact
    - Will shipping be a factor

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Milk Production Strategies

- Peak milk sets the lactation curve
  only get one chance each lactation
- High producing cows are most efficient and profitable
- Never give up milk
  - One pound of DM costs 15 cents
  - Milk prices vary, but use 22 cents per pound
  - One pound of DM can support 2+ pounds of milk ($0.44)
  - Profit of each pound of dry matter is **+$0.29/cow/day**

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Managing Feed Cost

- Know your costs
- Use feed efficiency as a tool
- Alternative feed sources
- Precision feeding approach
- Strategic use of feed additives

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Knowing Your Feed Costs

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Feed Benchmarks 2022--Illinois

	Lb DM	$/lb DM	$/day
Forages	28	0.10	2.80
Grain energy	10	0.12	1.20
By-product feeds	5	0.12	0.60
Protein supplements	5	0.20	1.00
Min /vit / additive	1	1.20	1.20
Ration balancing service			0.10
Total	49		7.50

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Feed Benchmarks 2022--Illinois

Feed costs per cow per day $7.50

	Milk Production	
	80 lb	70 lb
1. Feed cost per lb DM	0.15	
2. Feed cost per 100 lb milk	$9.38	$10.71
3. Income over feed costs / cow	$12.62	$11.29
4. Feed efficiency (lb milk/lb DM)	1.63	1.43

Feed Efficiency as a Tool

Power Of Feed Efficiency

- Relate the level of dry matter intake to fat or energy-corrected milk yield
- Compare different groups on the herd
- Measure the change when feeding and management changes are made

Feed Efficiency (FE)

Pounds of 3.5% FCM divided by pounds of DM consumed

Group	FE
High group, mature cows	>1.7
High group, 1st lactation	>1.6
Low group, all cows	>1.2
One group TMR herds	>1.5
Fresh cows (< 21 days)	<1.5
Concern	<1.3

Example:
75 lb of 3.5%FCM
divided by
50 lb DM
= 1.5 lb milk per lb of dry matter

Milk Yield Targets For Feed Efficiency

Milk Yield lb	Milk Yield kg	Feed Efficiency
55	25	1.25
60	27	1.32
65	30	1.38
70	32	1.44
75	34	1.49
80	36	1.54
85	38	1.58
90	40	1.63

Source:
The Ohio State University

Economics of Feed Efficiency

(70 pounds milk and $0.15 cent pound DM)

Feed Efficiency (lb milk/ lb DM)	DMI (lb/day)	Difference (savings/day)
1.3	54.0	
		$0.60
1.4	50.0	
		$0.51
1.5	46.6	

Evaluating Feed Ingredient Costs

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Midwest Breakeven Prices
(Sesame, January, 2022)

Feed	Current	Breakeven
Shelled corn	$217/ton	$197/ton
SBM—48%	$427/ton	$395/ton
Corn silage	$55/ton	$81/ton
High quality alfalfa hay	$236/ton	$208/ton
Soybean meal heated	$467/ton	$496/ton
Canola meal	$435/ton	$262/ton
Pork meat meal	$435/ton	$262/ton

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Midwest Breakeven Prices
(Sesame, January, 2022)

Feed	Current	Breakeven
Distillers grain	$187/ton	$265/ton
Corn gluten feed	$207/ton	$217/ton
Soy hulls	$178/ton	$161/ton
Fuzzy cottonseed	$300/ton	$314/ton
Wheat midds	$153/ton	$163/ton

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Precision Nutrient Feeding

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Precision Feeding Of Nutrients

- Use of a **rumen model** to fine tune nutrient digestibility, fill factors, and dry matter intake
- Provide the adequate level of MP based on RUP and microbial protein
- Grouping of lactating cows
  Fresh, early lactation, late lactation, and first lactation cows
- Avoid excessive nutrients
  Rumen protected amino acids, fats, minerals, and vitamins

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Protein Guidelines
(Source: 2001 and 2021 NRC, Holsteins, 680 kg body weight)

Item	Far Off	Close-Up	Fresh	Early	Mid	Late
DMI (kg)	14 **(13.9)**	10 **(12.3)**	15 **(20.8)**	30 **(28)**	24 **(27.4)**	20
Milk (kg)	None	None	35 **(33)**	55 **(55)**	35 **(43)**	25
CP (%)	9.9 **(11.9)**	12.4 **(14.3)**	19.5 **(16.2)**	16.7 **(17.4)**	15.2 **(17.5)**	14.1
RUP (%)	2.2	2.8	9.0	6.9	5.5	4.6
RDP (%)	7.7	9.6	10.5	9.8	9.7	9.5
MP (%)	6.0 **(5.2)**	8.0 **(9.8)**	13.8 **(10.9)**	11.6 **(10.2)**	10.2 **(10.1)**	9.2

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Carbohydrate Guidelines

(Adapted from 2001 NRC, Holsteins, 680 kg body weight)

Item	Far Off	Close-Up	Fresh	Early	Mid	Late
DMI (kg)	14	10	15	30	24	20
Milk (kg)	None	None	35	55	35	25
NDF (%)	40	35	30	28	30	32
NFC (%)	30	34	35	38	35	32
Starch (%)	14	18	22	26	24	22
Sugar (%)	4	6	6	6	5	4

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Strategic Use of Feed Additives

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Additives Recommended (Lactating Cows)

- Rumen buffers
- Yeast culture/yeast products
- Monensin (Rumensin)
- Silage inoculants
- Biotin
- Organic trace minerals

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Additives for Close Up Dry Cows

- Yeast culture/yeast products
- Monensin (Rumensin)
- Silage inoculants
- Organic trace minerals + chromium
- Rumen protected choline
- Anionic product: DCAD: < 0 to -20 meq / kg or 0 to-20 meq / 100 g; target urine pH of 6.0

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Additives Recommended for Fresh Cows

- Rumen buffers
- Yeast culture/yeast products
- Monensin (Rumensin)
- Calcium supplement (bolus/drench)
- Silage inoculants
- Biotin
- Organic trace minerals + chromium
- Rumen protected choline

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Hutjens "As Needs" List

- Propylene glycol or glycerol (300 to 500 ml)
- Calcium propionate (150 grams)
- Niacin (3 g protected; 3 g unprotected)
- Mycotoxin binders (clay mineral or yeast cell MOS compounds)
- Acid-based preservatives (baled hay / high moisture corn 0.5 to 1%)

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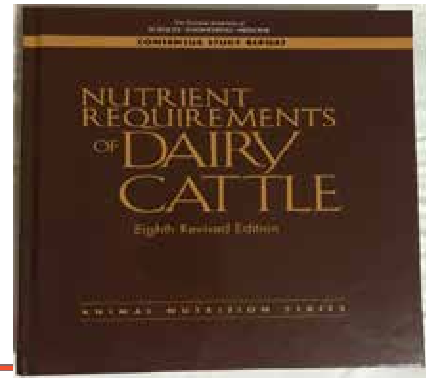
Take Home Messages

- Use all available tools to measure optimal performance
- Control the controllable costs
- Optimize milk yield and components
- May not be able to save your way to profits



The Dairy NRC 2021 Model

- Functions similar to NRC 2001 model
- Available in December, 2021 and free
- Contains amino acid guidelines
- Environmental nutrient impact (methane, nitrogen, and phosphorous)
- Fatty acid evaluation
- Feed costs can be entered

Dry Matter Intake (DMI): Mike Allen

- DMI for high producing cows lowered by 4 pounds
- DMI for low producing cows increased by 2 pounds
- DMI lowered first 31 days instead of 90 days
- Ratio of ADF:NDF or lignin can be used to predict DMI (user option)
- Fill factors: Forage NDF and forage fragility (particle size reduction, no lab measured)

Protein and Amino Acids—Mark Hanigan

- New equations to predict milk protein using five amino acids and "other amino acids".
- Model predicts amino acids. If the values are low, this amino acid needs supplementation.
- No "first limiting" amino acid concept.
- Optimal RDP level is 10% DM; maximum is 12%.

Macro-Minerals—Rich Erdman

- Recommendations are based on an absorbed mineral basis using absorption coefficient (AC).
- A minimum DCAD based on requirements for sodium, potassium, chloride and sulfur (not for heat stress).
- Magnesium: AC adjusted the magnesium to potassium equation, reduction in milk magnesium requirement, and an increase in maintenance.
- Sodium: maintenance increased 10-15 grams per day, drop in lactation requirements by 6 to 12 grams.

Trace Minerals—Bill Weiss

- No adjustments with dietary antagonists
- Does not include safety factors.
- Dry cows consume about half the dry matter take compared to lactating cows, same milligrams per day.
- AC are not included for organic trace minerals

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Trace Minerals (continued)

- Cobalt: increased to 0.2 ppm.
- Copper: 17 ppm dry cows and 9 ppm lactating cows.
- Chromium: no recommendations
- Manganese: 40 ppm for dry cows and 30 ppm milk cows should adequate.
- Selenium: no change; regulated by FDA.
- Zinc: dry cows raised 10 percent to approximately 28 ppm; lactating cows increased 15 percent to about 60 ppm.

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Vitamins—Bill Weiss

- Vitamin A: not changed except for cows producing over 75 lb of milk; add 450 IU/day per every lb of milk produced about 75 pounds.
- Vitamin D: Vitamin D2 has half the biological value of vitamin D3.
- Maintaining plasma concentrations of vitamin D 25-hydroxy at 30 nannograms per milliliter.
- Vitamin E: 1000 IU for far off dry cows and 2000 IU for close up dry cows

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Transition Cows—Bill Weiss

- Dry matter intake: The level of NDF determine the range from 1.8 to 2.0 percent of body weight.
- Springing heifers are set at 88% of mature cows.
- DMI starts dropping two weeks pre-partum gradually down to 1.6 percent of body weight in the model.
- Birth weight of the unborn calf is estimated based on parity and cow weight.

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Transition Cows--continued

- No adjustments are included in the model for twins.
- Protein levels: 12 percent crude protein (7.2 percent MP) for dry cows, 13 percent crude protein (8.6 percent MP) for close up dry cows, and 14% crude protein (9.2 percent MP)
- No adjustments for colostrum synthesis
- No adjustments for rumen protect methionine unless needed for amino acid requirements.

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Fats and Oils—Lou Armentano

- Ether extract is not use, fatty acids application
- Lipids were grouped in to 11 categories with unique digestibility (can be changed)
- Basal oils have a digestibility of 73%
- Fats do not generate methane and lowers production from other sources
- No depression of DMI due to fat feeding

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Carbohydrate—Mary Beth Hall

- Residual organic matter (ROM) and starch replaces NFC (non-fiber carbohydrates)
- Starch is a separate carbohydrate class
- 48 hours dNDF is recommended *invitro* time
- ROM = 100 – crude protein – ash -- fatty acids – starch – WSC – NDSF – organic acids-- glycerol

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Relationship of minimum forage NDF (fNDF), minimum NDF, and maximum starch levels

Minimum fNDF	Minimum NDF	Maximum starch
19	25	30
18	27	28
17	29	26
16	31	24
15	33	22

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Energy Supply—Bill Weiss

- Discount energy based on percent of body weight instead of multiples of maintenance
- Discount energy factor is lowered
- Starch is separated from ROM and dropping NFC
- Starch has a digestibility of 0.91 (91%) and be modified depending on processing

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Take Home Messages

- The changes reflect modern higher producing cows using recent research.
- The flexibility to change values in the model allow for more customization of diets.
- The guidelines are conservative using only multiple journal research published.

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Derek Nolan, Ph.D.
Teaching Assistant Professor, University of Illinois

Evaluating Cow Value

Evaluating Cow Value to Make Culling Decisions

Dairy Extension
ILLINOIS ACES

Derek Nolan
Illinois Dairy Summit
February 2nd, 2022

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Outline

- Why do cows leave the herd?
- Trends in cattle prices and cow numbers
- What do these prices mean?
- Genetic Improvement vs Longevity
- Culling Considerations
- Take Home Points

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How do we select cull cows

- Different for each farm
- Differ from situation to situation
- Health?
- Production?
- Repro?

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Culling

- Involuntary culling
  - Poor health
  - Injury
  - Poor reproductive performance
  - Death
- Voluntary
  - Low milk production
  - Dairy purposes

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US Culling Rates

Percent Cows*

Herd size (number of cows)						Region					
Small (30–99)		Medium (100–499)		Large (500+)		West		East		All operations	
Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error	Pct.	Std. error
27.8	(1.6)	30.8	(1.4)	35.1	(2.1)	36.7	(3.3)	31.4	(1.2)	33.8	(1.7)

USDA 2018

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Voluntary Culling Percent

Culling Reason	Small Herd (30 to 99)	Medium (100 to 499)	Large (500+)	All Operations
Infertility	23%	26%	20%	21%
Poor production	22%	17%	22%	21%
Clinical Mastitis	21%	18%	16%	17%
Sold as replacements	7%	6%	11%	10%
Lameness	7%	10%	7%	7%
Injuries	2%	3%	3%	3%
Respiratory	1%	2%	2%	2%
Other	5%	5%	4%	5%

USDA 2018

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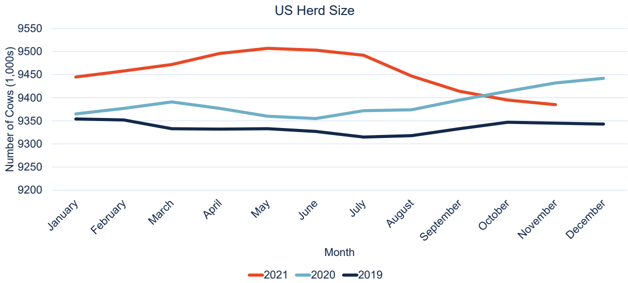
US Dairy Herd Size



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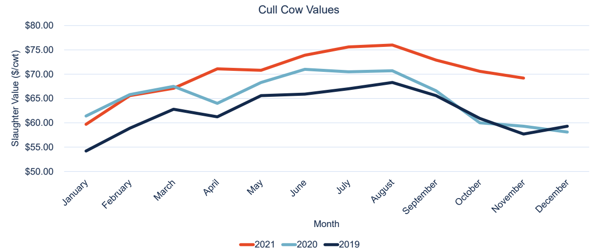
Cull Cow Prices



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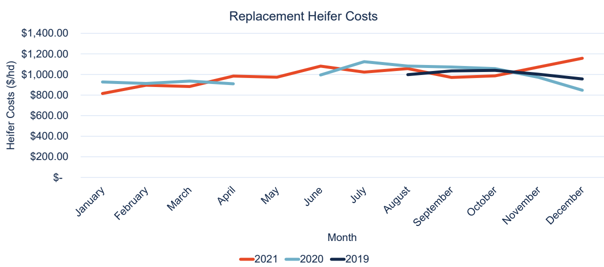
Bred Heifer Costs



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Cost of Culling

- Simplified:
  - Total cost = slaughter value – rearing or purchase cost of replacement

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Example

- Using average cost from last three years
- 1,300 lb cow

Year	Cull Cow Price	Replacement Costs	Total
2021	$723.34	$991.69	-$268.35
2020	$672.25	$984.98	-$312.73
2019	$641.54	$1,006.37	-$364.83
Average	$677.78	$991.68	-$313.90

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Cost of Culling

- Simplified:
  - Total cost = slaughter value – rearing or purchase cost of replacement
- Optimal Cost:
  - Retention Pay Off Value – Consider the potential income of cow in question vs potential income of replacement heifer

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Retention Pay Off Value

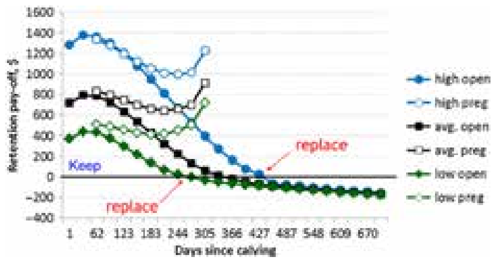
- Consider the potential income of cow in question vs potential income of replacement heifer (over a specific period of time)

Incomes	Costs
Milk Production	Cost of replacement
Value of the Calf	Feed costs
Slaughter Value	Insemination
	Cost of Days Open
	Disease Costs
	Probability of Survival

Retention Pay Off Value

- Positive = the amount of the money that should be spent keeping the cow in the herd
- Zero = optimal time of culling
- Negative = cow should be culled from the herd

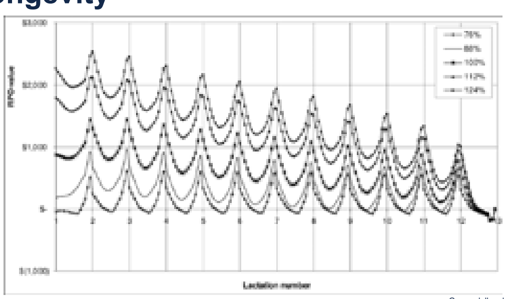
Retention Pay Off



Impacts on RPO

- Milk yield
- Pregnancy status – potential value of the calf
- Days open – decrease RPO rather quickly
- Assumes replacements are readily available

Longevity



Gronendall and Galligan 2005

Considering Cow Longevity

- Culling decisions based on cow age
- Cull old cows to make room for new genetics
- Potentially worth it to keep older cows around?

Longevity?

- Ability to live a long life
- Herd life – time from birth to culling
- Productive life – time from first calving to culling

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Breeding Value vs Productive Life

Schuster et al. 2020

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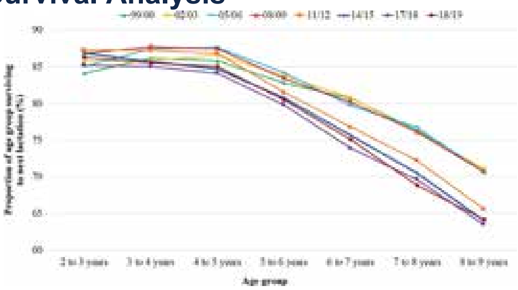
Survival Analysis



Schuster et al. 2020

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Costs associated with longevity

- Calf value opportunity costs – Not producing calves that can be sold because they are needed for replacements
- Aged cow cost – past peak lifetime milk yield (increased vet costs)

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Impacts of longevity costs

- Calf value opportunity costs – Decreases with with increased productive life
- Aged cow costs – Increases with increased productive life

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Costs associated with longevity

- Lack of maturity cost – lactations 1 to are less efficient milk producers
- Herd replacement costs – cost of heifer minus price received when cow leaves herd
- Genetic opportunity costs – cost of having older, less genetically improved cows

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Impacts of longevity costs

- Lack of maturity costs – Decreases with longer productive lifespan
- Herd replacement costs – Decreases with longer productive lifespan
- Genetic opportunity costs – Lower with younger herd

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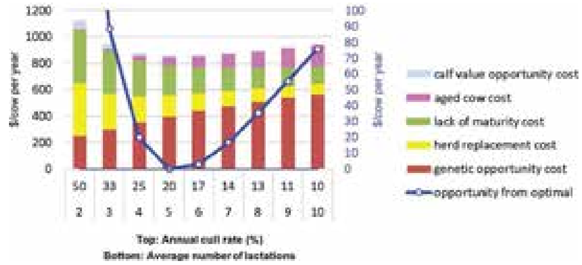
Optimal Productive Lifespan



De Vries (2020)

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Impacts of Productive Life

- Influx of heifers – pushing cows out
- Many of same culling reasons
  - Low production
  - Failure to conceive
  - Health problems

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University of MN study

- Combined DHIA and financial data
- Profitable herds had greater percentage of herd over 3rd lactation
- Consider break even costs of production
- Cumulative vs annual

Dr. Joleen Hadrich, 2021

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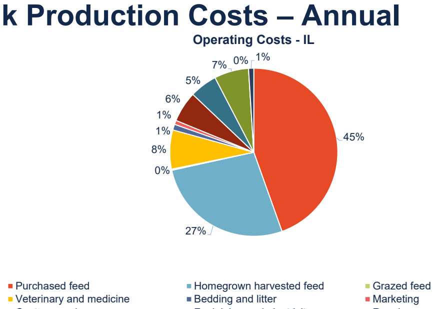
Milk Production Costs – Annual



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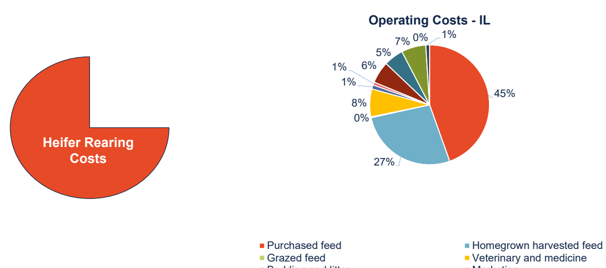
Milk Production Costs – Cumulative



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University of MN Study

- Profitable farms – keep cows past cumulative breakeven
- Money made minus costs = profit
- Resilient Farms – over 50% of cows have broken even
  - 50% of cows culled before they hit breakeven
  - Even with income from selling the cow

Dr. Joleen Hadrich, 2021

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Culling Rates

Heifer Rearing Cost	Profit $/cow/yr	Preg Rate	Annual Cull Rate	Surplus Heifer Calves
$1,400.00	$818.00	25%	59%	−22%
$1,600.00	$720.00	25%	41%	8%
$1,800.00	$647.00	25%	34%	21%
$2,000.00	$584.00	24%	30%	28%
$2,200.00	$526.00	24%	28%	32%
$1,400.00	$801.00	21%	64%	−30%
$1,600.00	$696.00	20%	44%	2%
$1,800.00	$617.00	20%	36%	15%
$2,000.00	$550.00	20%	32%	22%
$2,200.00	$488.00	20%	30%	26%

De Vries (2017)

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Take Home Messages

- Studies presented today only evaluate specific scenarios
- Culling decisions need to be specific to farm goals
- Keeping and evaluating records is **very** important

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Take Home Messages

- Retention Pay Off gives optimal time of culling
  - Very in depth analysis
- Breakeven costs more reasonable estimate
- Survival through time should be considered
- Culling is not always an economic decision

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Other Culling Considerations

- Longevity – spend the time and money to get your cows to pay off point
- Breakeven depends on cost of heifer raising
- Genetic testing
- Other selection options

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Other Producers Thinking About Culling

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Thank you

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Dairy Focus Lab

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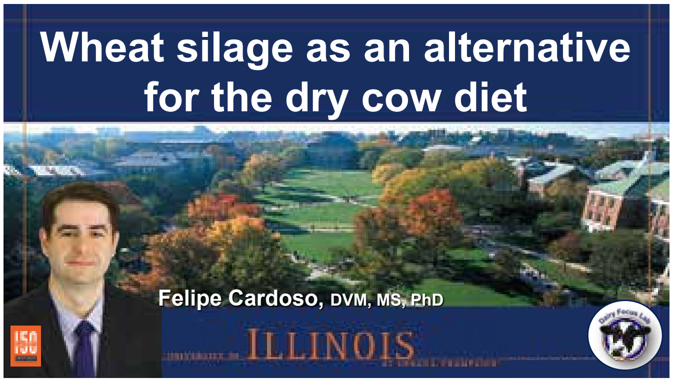
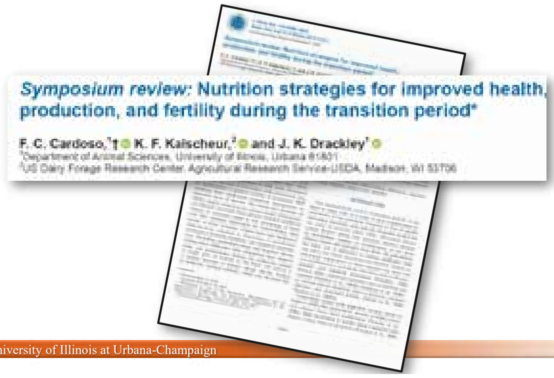
2022
Hybrid Illinois Dairy Summit

PHIL CARDOSO. DVM, Ph.D.
University of Illinois

Wheat Silage as an Alternative for the Dry Cow Diet





Dietary Recommendations for Dry Cows

- **NEL:** Control energy intake at 14 to 16 Mcal daily [diet ~ 1.32 Mcal/kg (0.60 Mcal/lb) DM] for mature cows
- **Crude protein:** 12 – 14% of DM
- **Metabolizable protein (MP):** > 1,200 g/d
- **Starch content:** 12 to 15% of DM (NFC < 26%)
- **NDF from forage:** 40 to 50% of total DM or 4.5 to 6 kg per head daily (~0.7 – 0.8% of BW). Target the high end of the range if more higher-energy fiber sources (like grass hay or low-quality alfalfa) are used, and the low end of the range if straw is used (2-5 kg)
- **Total ration DM content:** <50% (add water if necessary)
- **Minerals and vitamins:** follow guidelines (For close-ups, target values are 0.40% magnesium (minimum), 0.35 – 0.40% sulfur, potassium as low as possible (Mg:K = 1:4), a DCAD of near zero or negative, calcium without anionic supplementation: 0.9 to 1.2% (~125g) calcium with full anion supplementation: 1.5 to 2.0% (~200g), 0.35 – 0.42% phosphorus, at least 1,500 IU of vitamin E, and 25,000 – 30,000 IU of Vitamin D (cholecalciferol)

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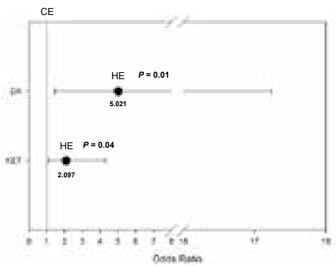
Excess dietary energy in dry period increased metabolic disorders



Odds ratios and 95% confidence intervals for the association of Far-off and Close-Up with high energy diet (HE) versus Far-Off and Close-Up with controlled energy diet (CE).
PHREG procedure considering experiment as random.
DA: displacement of abomasum (n = 36/315, total n= 351); KET: ketosis (n = 61/289, total n = 350).

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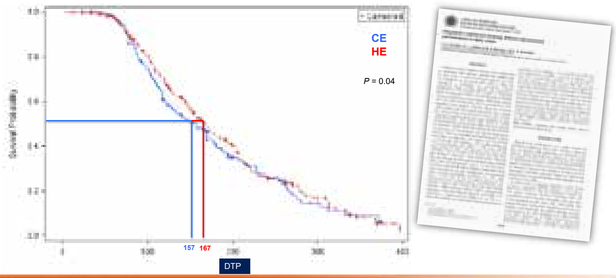
Cardoso et al., 2013

Association of cows receiving different treatments prepartum and days to pregnancy (DTP)



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Cardoso et al., 2013

How to build the dry cow diet?

- High forage digestibility is important
- Diets with more than 50% forage seem to work better
- No more than 4kg (~10 lb) of total DM coming from ingredients with more than 40% of NDF that are not from forage (by-product feeds)

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How to build the dry cow diet? continuing...

- Cows usually eat 12–14 kg of dry matter (DM)
- 3 – 4 kg DM from chopped hay/straw
  - Particle size < 1.5 in (3 cm)
- No more than 4 kg DM from corn silage (only USA?)
  - Corn grain in the diet will come from corn silage
- Add forage with low energy and high NDF (hay/straw) if necessary

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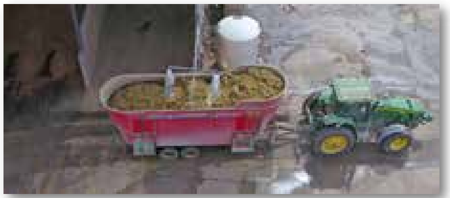
Common problems in management

- Sorting
  (improper processing, mixing, or DM content)



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Common problems in management

- Sorting (improper processing, mixing, or DM content)
- **Dietary composition too different from pre- to postpartum (e.g., starch, silage vs. hay)**
- Inadequate access to feed (overcrowding, no push-up, not enough fed)
- Limited water availability
- Failure to adjust for changing DM% of feeds
- Moldy or poor-quality ingredients

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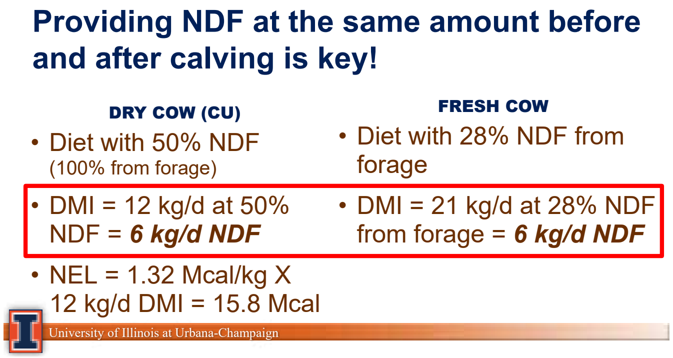
Providing NDF at the same amount before and after calving is key!
DRY COW (CU)
• Diet with 50% NDF (100% from forage)
• DMI = 12 kg/d at 50% NDF = 6 kg/d NDF
• NEL = 1.32 Mcal/kg X 12 kg/d DMI = 15.8 Mcal
FRESH COW
• Diet with 28% NDF from forage
• DMI = 21 kg/d at 28% NDF from forage = 6 kg/d NDF
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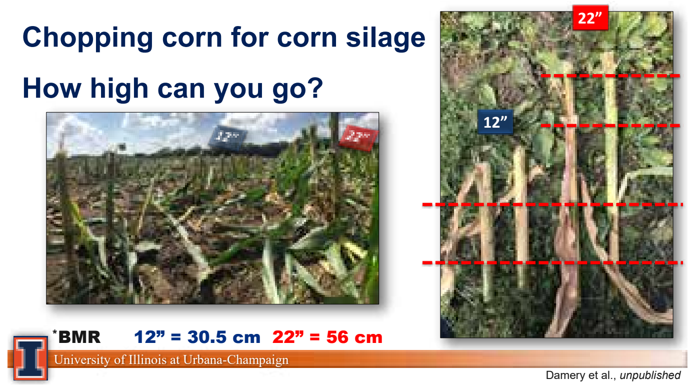
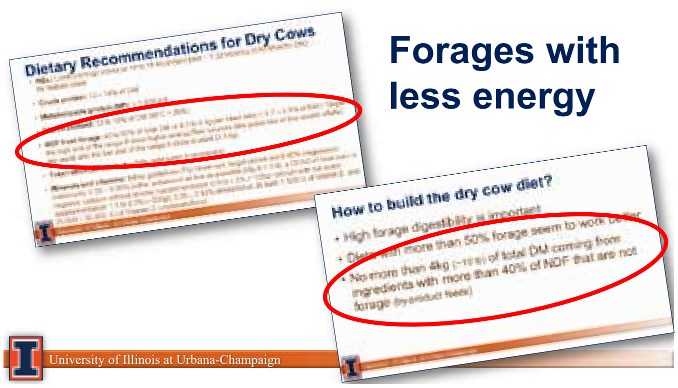
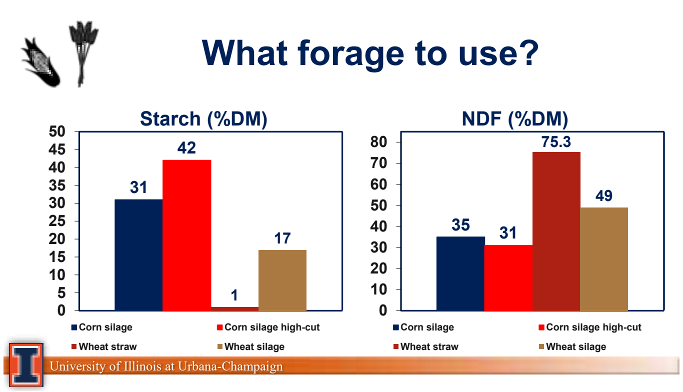
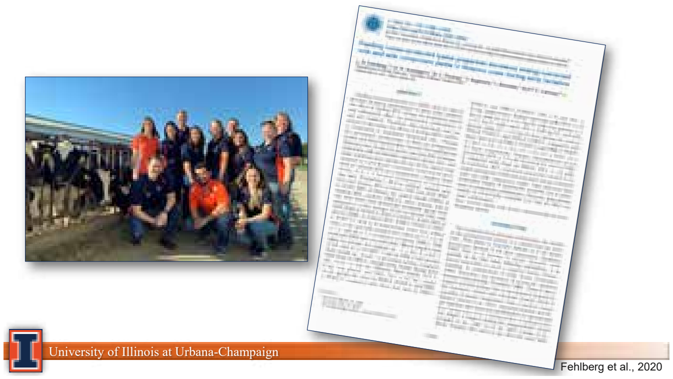
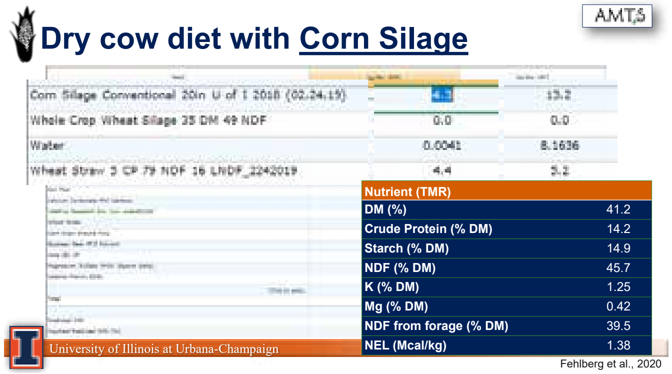

Chopping corn for corn silage
How high can you go?
12”
22”
*BMR 12” = 30.5 cm 22” = 56 cm
University of Illinois at Urbana-Champaign
Damery et al., unpublished

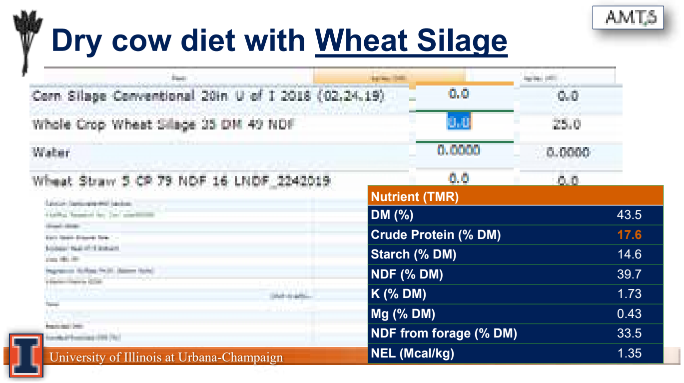

Text from an IL dairy farmer.
August 23, 2018
38” = 96.5 cm
University of Illinois at Urbana-Champaign


Forages with less energy
Dietary Recommendations for Dry Cows
How to build the dry cow diet?
• High forage digestibility is important
• Diets with more than 50% forage seem to work better
• No more than 4kg (~10 lb) of total DM coming from ingredients with more than 40% of NDF that are not forage (by-product feeds)
University of Illinois at Urbana-Champaign


What forage to use?
Starch (%DM)
31
42
1
17
NDF (%DM)
35
31
75.3
49
Corn silage
Corn silage high-cut
Wheat straw
Wheat silage
University of Illinois at Urbana-Champaign


University of Illinois at Urbana-Champaign
Fehlberg et al., 2020


Dry cow diet with Corn Silage
AMTS
Corn Silage Conventional 20in U of I 2018 (02.24.19)
13.2
Whole Crop Wheat Silage 35 DM 49 NDF
0.0
0.0
Water
0.0041
8.1636
Wheat Straw 5 CP 79 NDF 16 LNDF_2242019
4.4
5.2
Nutrient (TMR)
DM (%) 41.2
Crude Protein (% DM) 14.2
Starch (% DM) 14.9
NDF (% DM) 45.7
K (% DM) 1.25
Mg (% DM) 0.42
NDF from forage (% DM) 39.5
NEL (Mcal/kg) 1.38
University of Illinois at Urbana-Champaign
Fehlberg et al., 2020


Dry cow diet with Wheat Silage
AMTS
Corn Silage Conventional 20in U of I 2018 (02.24.19)
0.0
0.0
Whole Crop Wheat Silage 35 DM 49 NDF
25.0
Water
0.0000
0.0000
Wheat Straw 5 CP 79 NDF 16 LNDF_2242019
0.0
0.0
Nutrient (TMR)
DM (%) 43.5
Crude Protein (% DM) 17.6
Starch (% DM) 14.6
NDF (% DM) 39.7
K (% DM) 1.73
Mg (% DM) 0.43
NDF from forage (% DM) 33.5
NEL (Mcal/kg) 1.35
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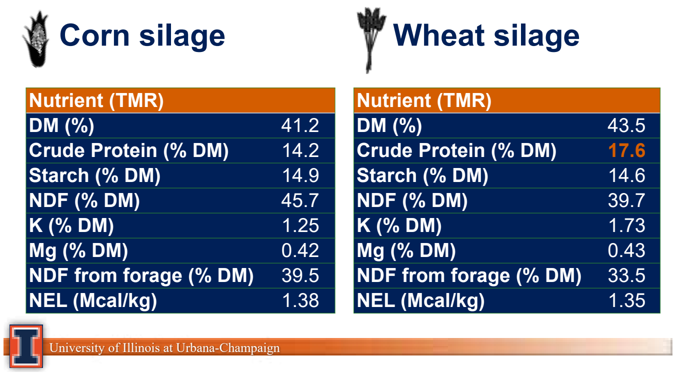
Corn silage
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DM (%) 43.5
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K (% DM) 1.73
Mg (% DM) 0.43
NDF from forage (% DM) 33.5
NEL (Mcal/kg) 1.35
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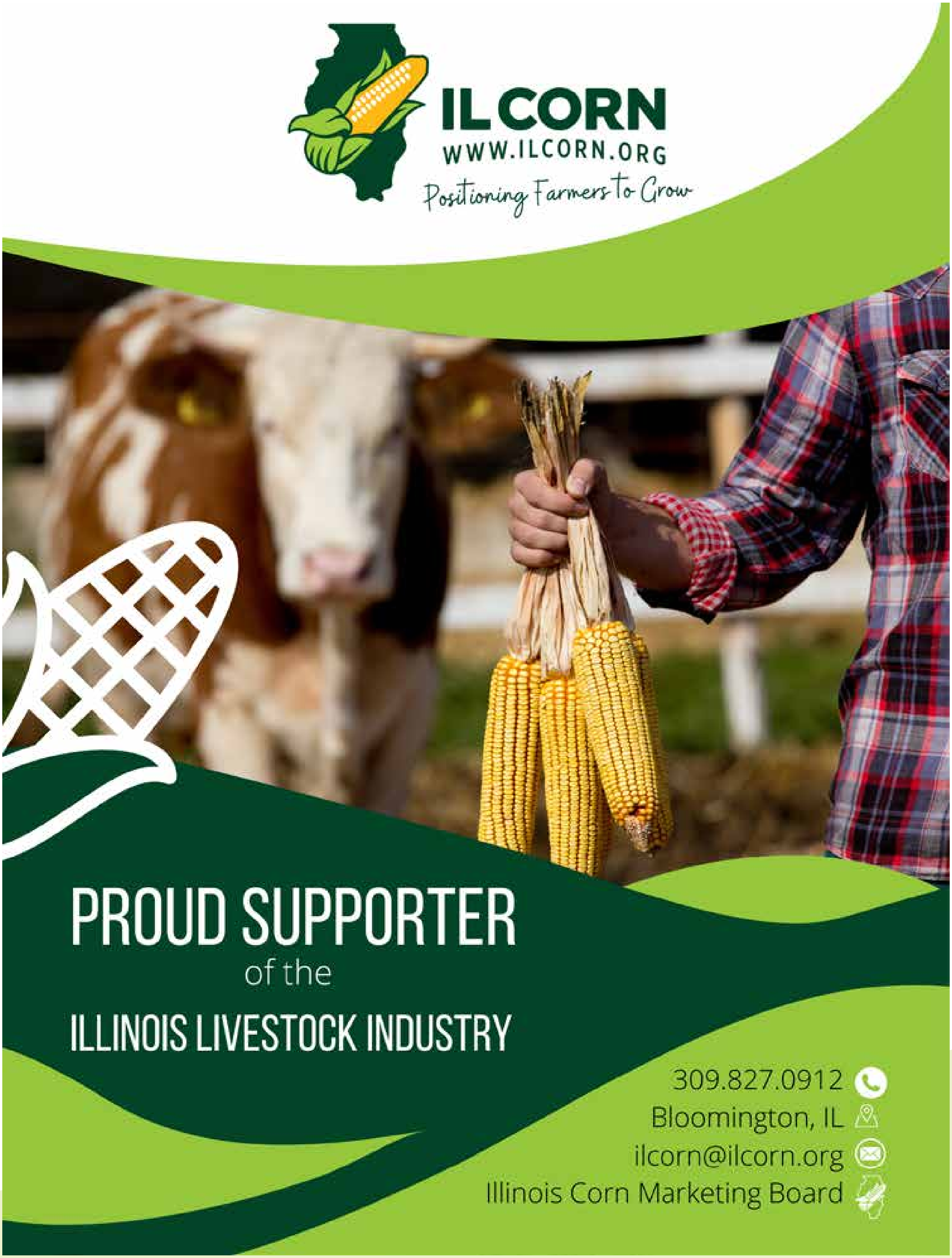
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For St. Louis District Dairy Council, dairy promotion happens county by county, city by city, and school by school. The way we look at it, success in the global world demands a continued commitment to the local one. As your checkoff organization, we're committed to delivering world-class dairy promotion by actively engaging dairy consumers in our Illinois schools and communities.

St. Louis District Dairy Council
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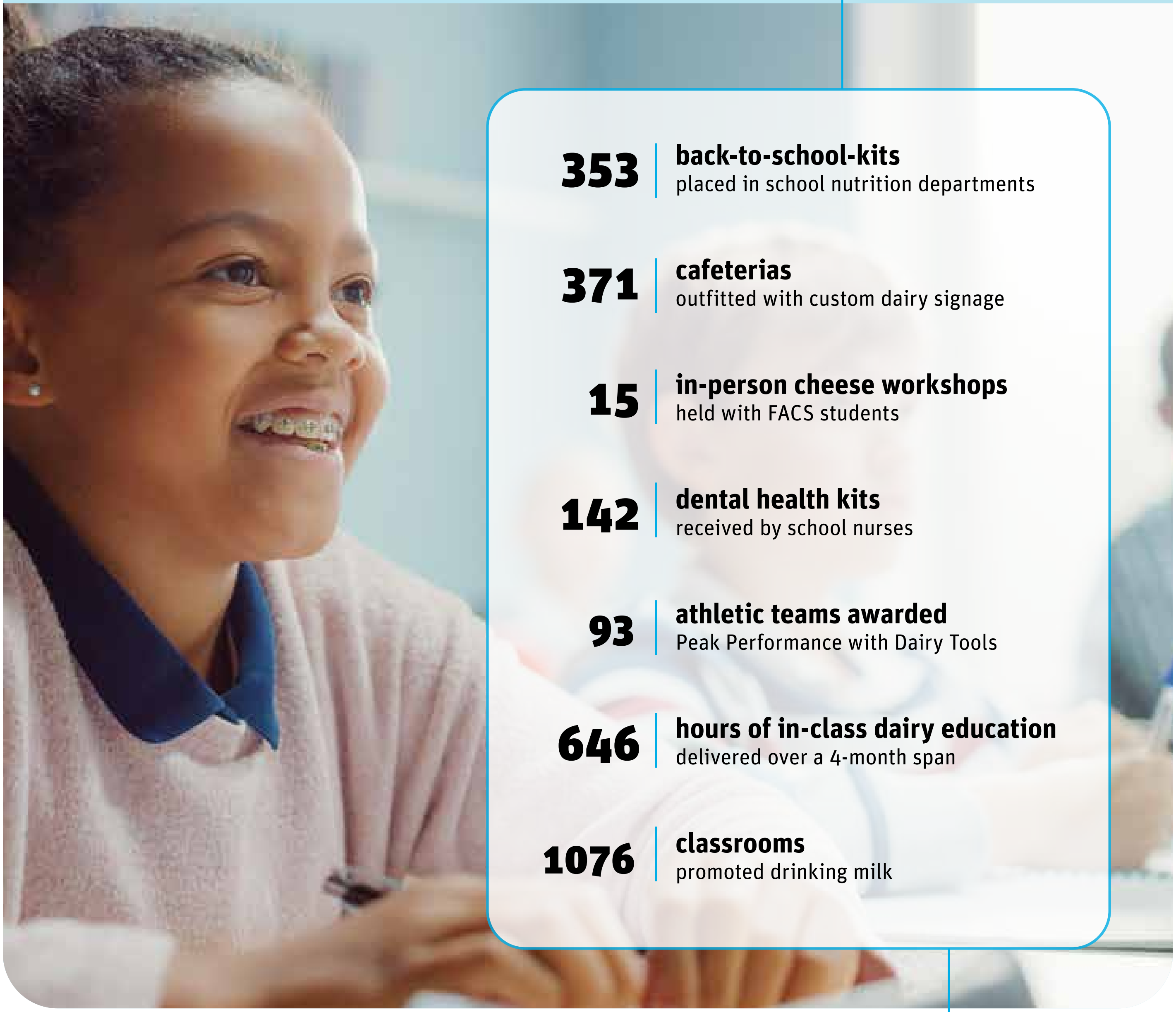
ENGAGING STUDENTS WITH DAIRY AT THE LOCAL LEVEL BY Growing Awareness



353 | **back-to-school-kits** placed in school nutrition departments

371 | **cafeterias** outfitted with custom dairy signage

15 | **in-person cheese workshops** held with FACS students

142 | **dental health kits** received by school nurses

93 | **athletic teams awarded** Peak Performance with Dairy Tools

646 | **hours of in-class dairy education** delivered over a 4-month span

1076 | **classrooms** promoted drinking milk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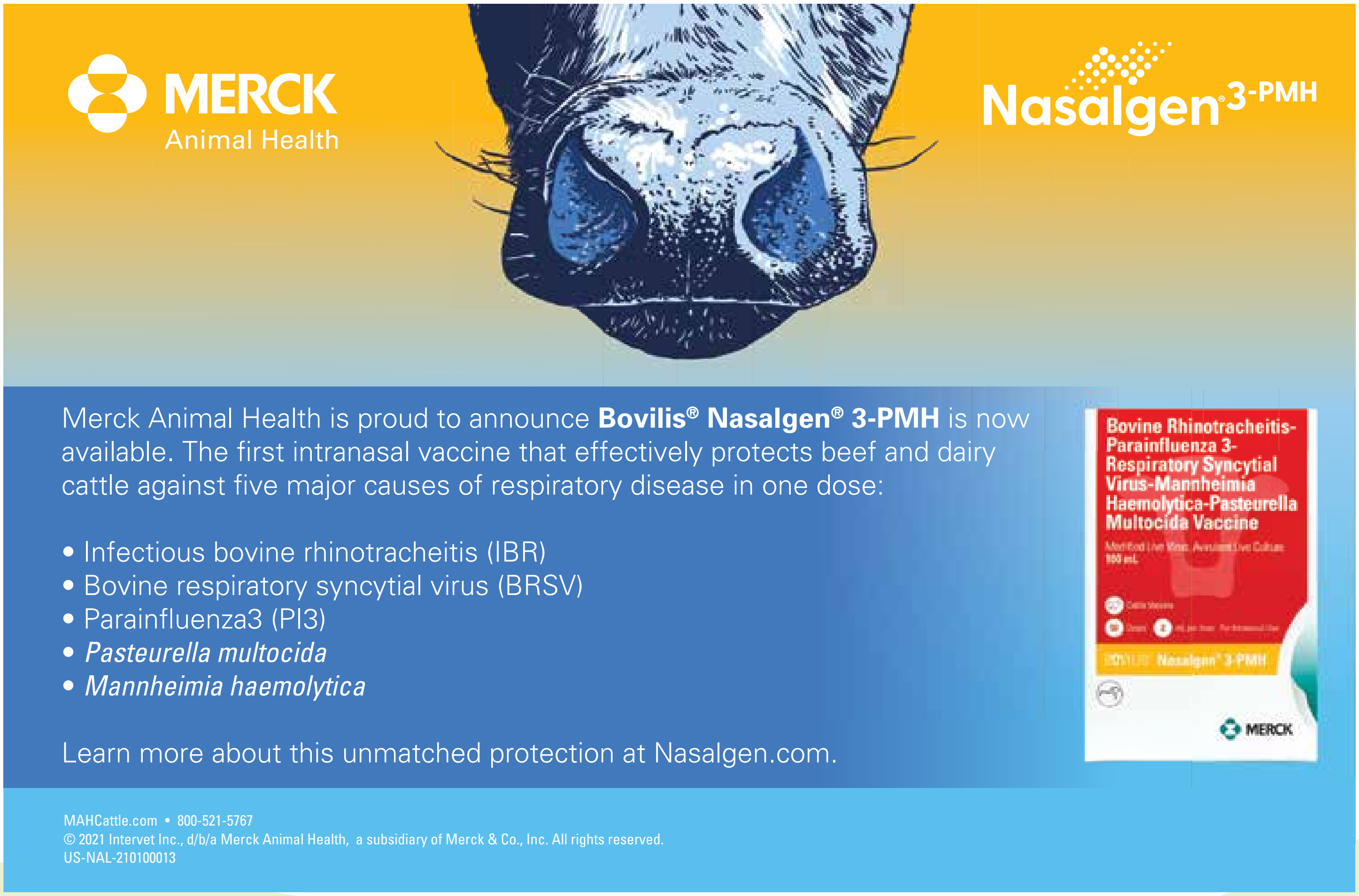
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*M. Al-Qaisi et al., Res. Vet. Sci., 129 (2020), pp. 74-81
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