Optimize Breeding and Replacement Decisions using Milk Recording Data

R.H. Fourdraine[1], J.S. Clay[1] & A. De Vries[2]

[1]Dairy Records Management Systems

[2]University of Florida

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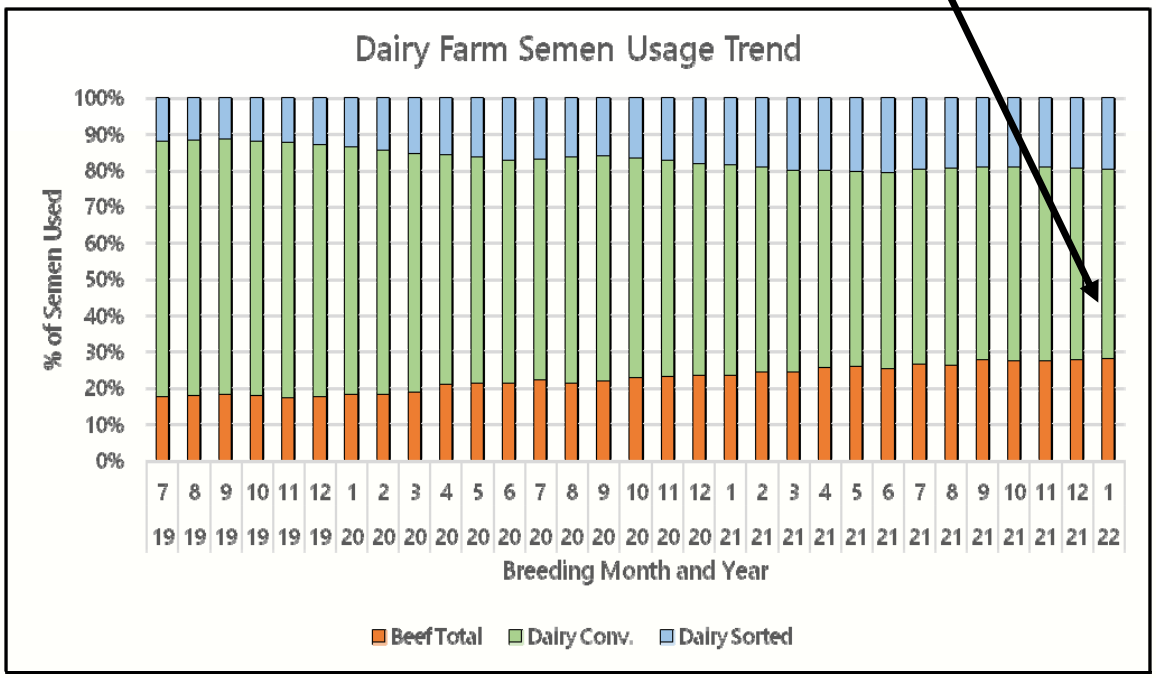
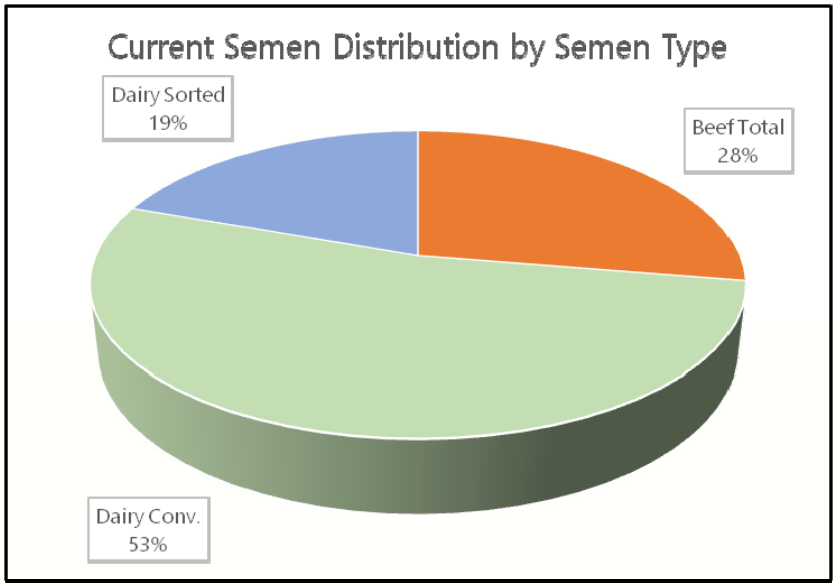
DAIRY RECORDS MANAGEMENT SYSTEMS

United States Breeding Trends

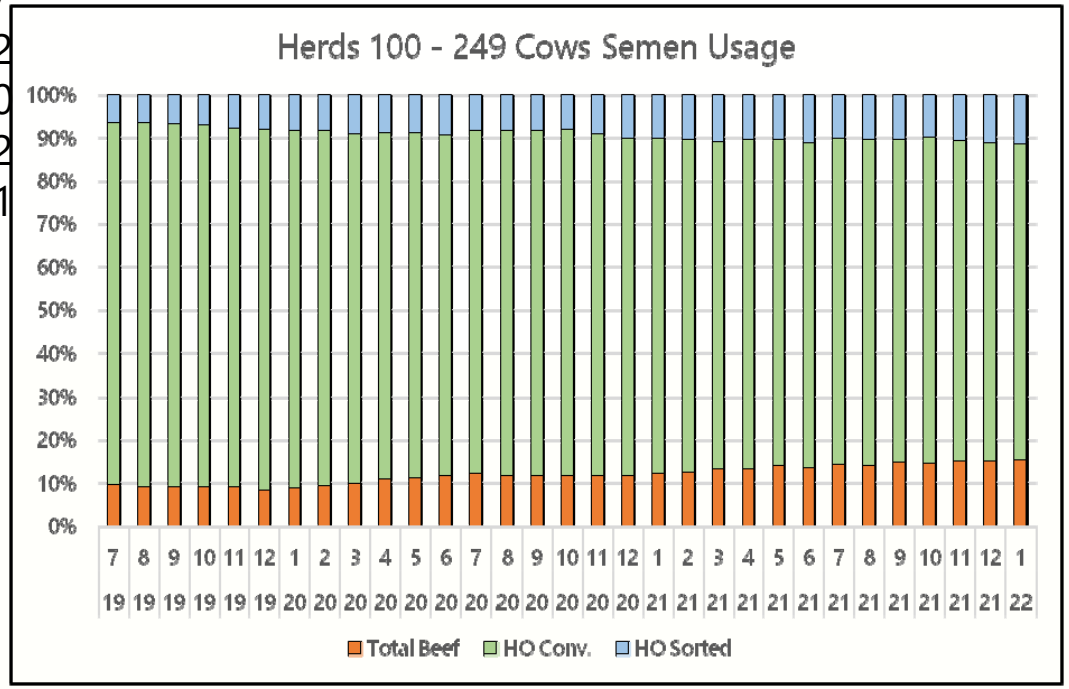
Breeding records from 2,000,000 DRMS Cows

- Growing use of sorted semen
- Less Dairy Conventional Semen
- More Beef Semen

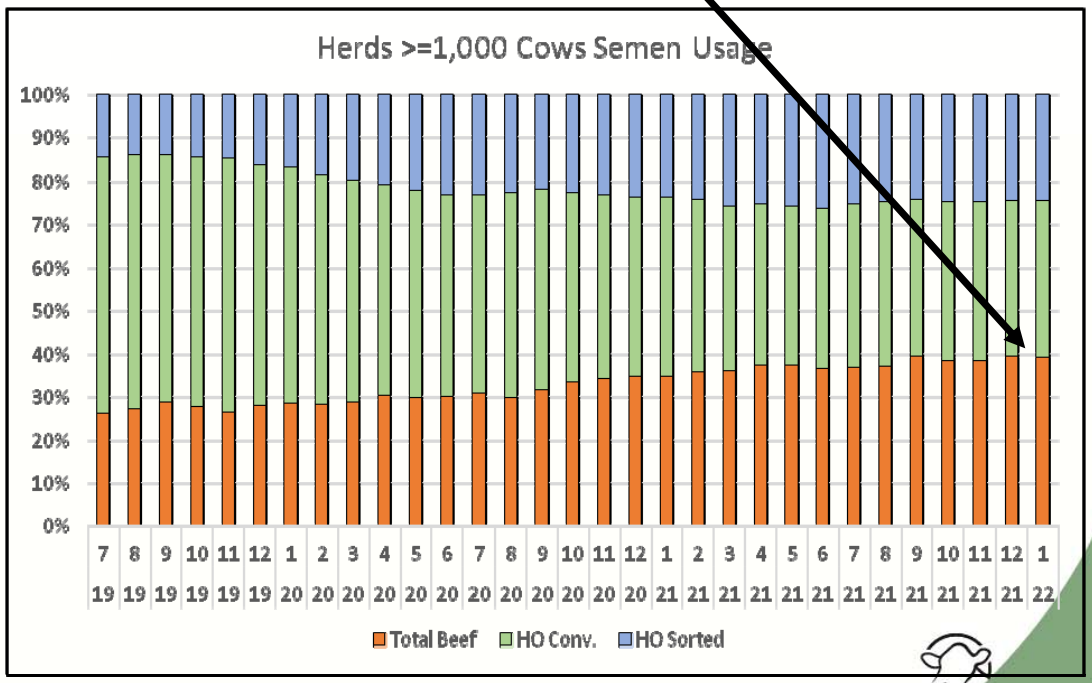




Use based on Herd Size



Larger herds use more Beef semen then Conventional Dairy semen, and it is still growing



What are the Breeding Choices?

	Service #	% Beef	% HO Conv	% HO Sorted	% Jersey
Heifer	1	4.0%	36.0%	58.3%	1.7%
	2	6.7%	40.0%	51.7%	1.6%
	3	25.3%	48.2%	24.6%	1.9%
1st Lact	1	13.1%	59.8%	24.8%	2.3%
	2	19.5%	61.2%	17.0%	2.2%
	3	37.7%	55.3%	6.3%	0.7%
2nd Lact	1	24.8%	60.6%	13.4%	1.1%
	2	29.8%	60.4%	9.0%	0.9%
	3	42.8%	53.7%	2.8%	0.6%
3> Lact	1	36.1%	55.2%	7.8%	0.8%
	2	39.8%	54.4%	5.2%	0.6%
	3	50.2%	47.1%	2.1%	0.7%

Use of Beef semen is no longer reserved to later lactation or cows with 3 breedings or more

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11/19/2021

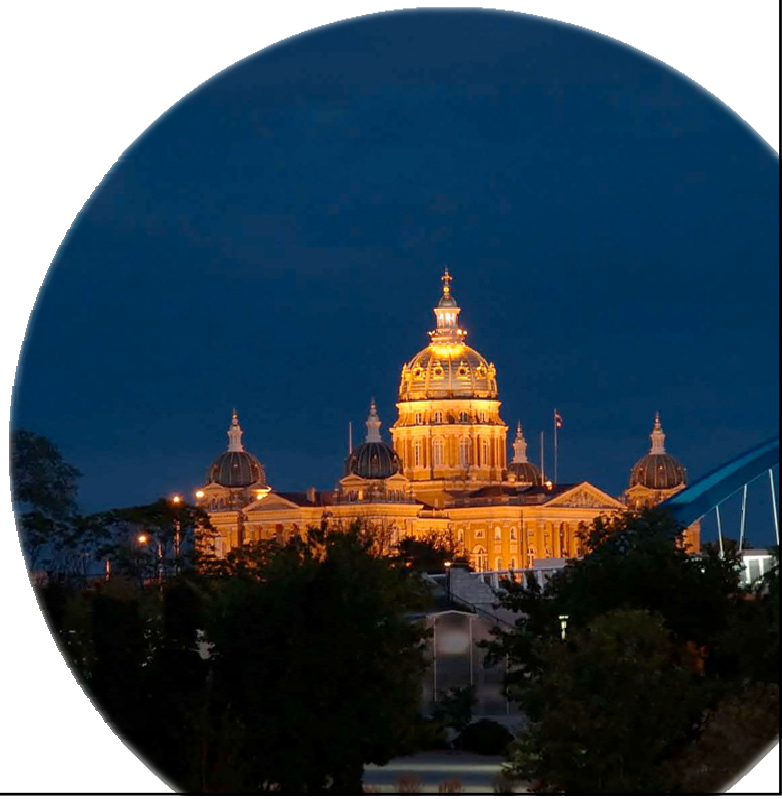
Decisions related to Beef on Dairy?

We now have 6 choices to consider:

- Breed to Sexed Dairy or, Conventional Dairy
- Use as ET donor cow or recipient
- Breed to Beef
- OR
- Do not breed - But replace

Factors to consider:

- Current Reproductive status: Open, Pregnant, Abort
- How many times was she bred
- Current and/or past lactation production
- Health problems (metabolic, repro, mastitis, …)
- Genetic value of the animal as it relates to future offspring
- ….



Need for a Decision Support Tool

Prediction model developed by the University of Florida and implemented by DRMS:

- Decision support software
- Reduces the guesswork
- Simplify Keep/Breed decisions
- Uses cow data from milk recording systems.

Concept

Develop a model that:

- Calculates an economic value for each the cow in the herd
- Calculates economic values for breeding a cow to either dairy conventional, dairy sorted or beef semen.
- Is responsive to daily changes.

Incorporate outcomes from the model in a decision support tool:

- Show the relative ranking of the cow in the herd
- Recommend first and second breeding choices for cows to breed.

Where can I use these Results?

Daily decisions:

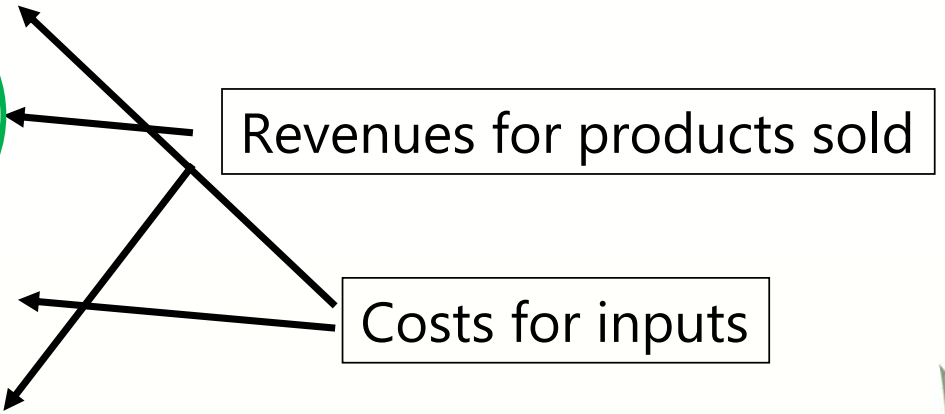
- Do I want another lactation out of this cow?
- Do I want a dairy calf out of this cow?
- Should I breed this cow now or wait?
- Do I sell her now or wait?

Considerations:

- Milk Check
- Future number of replacements needed
- Genetic progress

Producer Provided Parameters

Heifer Raising Cost ($/head)	1770
Cull Cow Revenue ($/lbs)	0.62
Milk Price ($/lbs)	0.081
Fat Price ($/lbs)	3.0935
Protein Price ($/lbs)	2.7182
Conventional Dairy Semen Cost ($/Unit)	8
Sexed Dairy Semen Cost ($/Unit)	23
Beef Semen ($/Unit)	8
Dairy Bull Calf Revenue ($/head)	110
Dairy/Beef Calf Revenue ($/head)	215
$0 NM$ Dairy Heifer Calf value ($/head)	-900

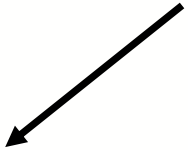


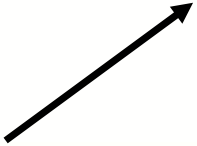
Model features NRC Guide with adjustment factor for feed cost

Milk Recording Data

Last Test Date Values:	
Last Test Date	3/24/2022
305D ME Milk Lact 1	25372
305D ME Fat Lact 1	1096
305D ME Protein Lact 1	800
305D ME Milk Lact 2	31230
305D ME Fat Lact 2	1295
305D ME Protein Lact 2	984
305D ME Milk Lact 3	33815
305D ME Fat Lact 3	1393
305D ME Protein Lact 3	1043
Cow Service Rate %	86
Heifer Service Rate %	99
Cow Conception Rate %	28
Cow 1st Service Conception Rate %	27
Heifer 1st Serv Conception Rate %	63

Herd data





Individual Cow data

Cow Data	
Index	3639
Breed	HO
Lact	8
DIM	234
Repro Code	P
Status Code	2
Days Bred	140
Days Dry Current	
Current Breeding Number	1
Cow NM$	150
CurTestday DIM	207
Milk	100.8
Fat%	2.7
Pro%	3
Prv Testday DIM	165
Prv Milk	107.7
Prv Fat%	2.6
Prv Pro%	3
Lct 305AcM	31459
Lct 305AcF	912
Lct 305AcP	940
Prv Lct DIM	323
Prv Lct 305AcM	39788
Prv Lct 305AcF	1153
Prv Lct 305AcP	1144
Prv Days Open	95
LTD Milk	23167
LTD Fat	691
LTD Pro	681

Results

Group	ID	Breed	Lact #	Status	DIM	Prev Milk	Milk	KeepDollar	Keep Perc.	Proj ME ECM	Proj ME Milk	Prev Lact 305 Milk	NM$
4	7407	HO	2	2	124	127.2	124.2	1356	82	35368	29511	27208	596
4	7408	HO	2	2	104	101.7	93	-1	5	25127	22783	24807	454
3	7409	HO	2	2	128	137.4	126.6	1335	82	37850	33351	24395	361
3	7410	HO	2	2	135	101.7	106.8	66	9	28919	27677	22490	358
3	7411	HO	2	2	144	127.2	109.8	930	60	36111	32441	23971	222
4	7413	HO	2	2	118	155.1	162.3	829	51	35313	36153	29971	245
6	7414	HO	2	2	89	127.8	141	255	17	29917	30038	26843	319

Keep Percentile indicates ranking within the herd
Considerations:
- Do I Breed a low Keep Perc. Cow?
- Do I sell her?

Breeding Results

Group	ID	Breed	Lact #	Status	DIM	Prev Milk	Milk	KeepDollar	Keep Perc.	NM$	First Choice	Second Choice	First over Second
1	8072	HO	1	6	60		73	863	54	715	S	C	18
1	8068	HO	1	6	68		93.6	1020	66	680	S	C	17
1	8035	HO	1	6	62		94.3	898	58	689	S	C	16
1	8033	HO	1	6	59		93.3	924	59	603	S	C	10

First Choice type of semen to be used

How much do I gain from using first choice over second choice?
-Rank by First Choice
-Will help in determining limit on number of cows to breed to Sexed or Beef

Group	ID	Breed	Lact #	Status	DIM	Prev Milk	Milk	KeepDollar	Keep Perc.	NM$	First Choice	Second Choice	First over Second
3	5080	HO	7	2	76	73.6	139.5	829	51	-50	B	C	30
3	5215	HO	6	2	52		117.3	798	49	94	B	C	19
2	5411	HO	6	2	61		94.2	971	62	85	B	C	21
3	5493	HO	6	2	40		100.5	1438	87	478	C	B	5

Next Steps

Producer Input

- Prototype Report Testing

Distribution

- Make available via the cloud
  - Use PCDART data (updated daily!)
  - Or use Test day data
- Make results available in PCDART
  - Allows for combining with other cow data

Expand to include Heifer value and Heifer breeding recommendations

Optimize the overall herd breeding decisions

- Based up on # replacements needed
- Combine Heifer and Cow results.

Thank You

Acknowledgements:

Dr. Albert De Vries, University of Florida

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