



Impact of Decision Support Tools Available for Dairy Farm Management



UW-Dairy Management
Decision Support TOOLS

Victor E. Cabrera
University of Wisconsin-Madison



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This site is designed to support dairy farming decision-making focusing on model-based scientific research. The ultimate goal is to provide user-friendly computerized decision support tools to help dairy farmers improve their economic performance along with environmental stewardship.



UW-Dairy Management
Decision Support TOOLS

University of Wisconsin

- [University of Wisconsin - Madison](#)
- [UW - Cooperative Extension](#)
- [UW - Dairy Science](#)
- [Dairy Cattle Reproduction](#)
- [Dairy Cattle Nutrition](#)
- [Milk Quality](#)
- [UW Dairy Nutrient](#)
- [Understanding Dairy Markets](#)
- [UW Center for Dairy Profitability](#)

Latest Projects

- [Improving Dairy Farm Sustainability](#)
- [Genomic Selection and Herd Management](#)
- [Dairy Reproduction Decision Support Tools](#)
- [Strategies of Pasture Supplementation](#)
- [Improving Dairy Cow Fertility](#)

Contact



Associate Professor
Extension Specialist
in Dairy Management
279 Animal Sciences
1675 Observatory Dr.
Madison, WI 53706
(608) 265-8506
vcabrera@wisc.edu
[More »](#)

Victor E.Cabrera, Ph.D.



Helpful Link

[Repro Money Program](#)

Tweets

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-  **UW-Madison** [@UWMadison](#) 11 Apr
Drop everything, this time-lapse will make you want to shout from the mountaintops, "I love Madison!" youtu.be/_8cGpJARTvw
Retweeted by Victor E. Cabrera
[Show Media](#)
-  **Victor E. Cabrera** [@vecabrera](#) 18 Mar
wisc.edu fb.me/6KXw7HsFF

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Tools

A collection of the state-of-the-art and scientific-based dairy farm management decision support tools that are user-friendly, interactive, robust, visually attractive, and self-contained. These tools count with associated documentation and video demonstrations. Technical support on their application is also available upon request.

Feeding

- > [FeedVal 2012](#)
- > [Grouping Strategies for Feeding Lactating Dairy Cattle](#)
- > [Optigen® Evaluator](#)
- > [Income Over Feed Supplement Cost](#)
- > [Dairy Extension Feed Cost Evaluator](#)
- > [Corn Feeding Strategies](#)
- > [Income Over Feed Cost](#)
- > [Dairy Ration Feed Additive Break-Even Analysis](#)

Heifers

- > [Heifer Pregnancy Rate](#)
- > [Cost-Benefit of Accelerated Liquid Feeding Program for Dairy Calves](#)
- > [Economic Value of Sexed Semen Programs for Dairy Heifers](#)
- > [Heifer Replacement](#)
- > [Heifer Break-Even](#)

Reproduction

- > [Wisconsin-Cornell Dairy Repro: A Reproductive Programs Economics Analysis Tool.
Replaces previous tools UW-DairyRepro\\$ and UW-DairyRepro\\$Plus.](#)
- > [The Economic Value of a Dairy Cow](#)
- > [Economic Value of Sexed Semen Programs for Dairy Heifers](#)
- > [Exploring Timing of Pregnancy Impact on Income Over Feed Cost](#)
- > [Dairy Reproductive Economic Analysis](#)
- > [Heifer Pregnancy Rate](#)
- > [Retention Pay-Off \(RPO\) Calculator](#)

> 40 tools

Production

- > [Characteristics of organic, grazing, and conventional dairy farms in the state of Wisconsin](#)
- > [Milk Curve Fitter](#)
- > [Decision Support System Program for Dairy Production and Expansion](#)
- > [Economic Analysis of Switching from 2X to 3X Milking](#)
- > [Lactation Benchmark Curves for Wisconsin](#)
- > [Economic Evaluation of using rbST](#)
- > [Alfalfa Yield Predictor: Using a Computer Application to Predict Irrigated Alfalfa Yield](#)

Replacement

- > [The Economic Value of a Dairy Cow](#)
- > [Value of a Springer](#)
- > [Heifer Replacement](#)
- > [Heifer Break-Even](#)
- > [Herd Structure Simulation](#)
- > [Retention Pay-Off \(RPO\) Calculator](#)

Health

- > [Economic Evaluation of CholiPEARL](#)
- > [Improve Milk Bulk Tank SCC](#)

Financial

- > [LGM-Dairy Analyzer](#)
- > [Working Capital Decision Support System](#)
- > [The Wisconsin Dairy Farm Ratio Benchmarking Tool](#)
- > [Decision Support System Program for Dairy Production and Expansion](#)
- > [Least Cost Optimizer](#)
- > [LGM-Dairy Premium Sensitivity](#)
- > [Return to Labor](#)
- > [Estimate Your Mailbox Price](#)
- > [LGM Dairy Feed Equivalent Calculator](#)
- > [Net Guarantee Income Over Feed Cost for LGM-Dairy](#)

Price Risk

- > [LGM-Dairy Premium Sensitivity](#)
- > [Least Cost Optimizer](#)
- > [LGM Premium](#)
- > [LGM Dairy Feed Equivalent Calculator](#)
- > [Milk Component Price Analysis](#)

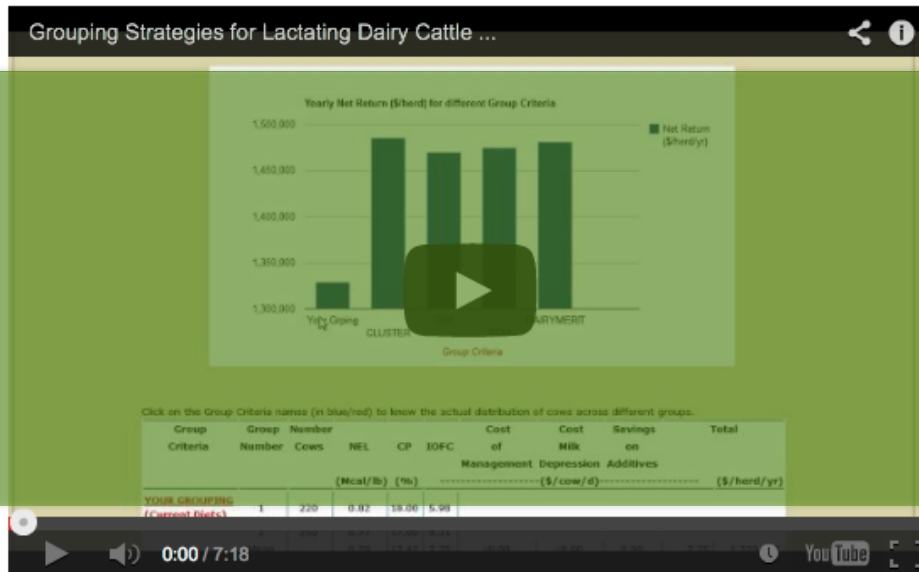
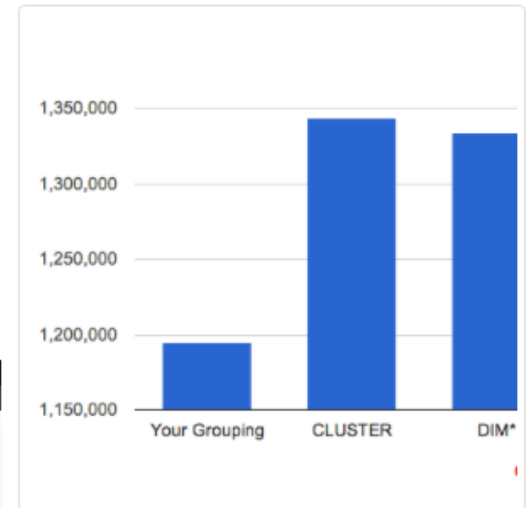
Environment

- > [Dairy Nutrient Manager](#)
- > [Grazing-N: Application that Balances Nitrogen in Grazing Systems](#)
- > [Seasonal Prediction of Manure Excretion](#)
- > [Dynamic Dairy Farm Model](#)

Elements of Decision Support Tools

UW-Dairy Management

Category	Feeding
Name	FeedVal 2012 Grouping Strategies for Feeding Lactating Dairy Cattle
Short description	Evaluates grouping strategies for feeding lactating dairy cattle
Link	HTML Online Tool (Open) Instructions and Documentation (Download) Presentation 1 (Download) Presentation 2 (Download) Paper (Download) Demo (Click to View/Hide the Video)
Supplementary documentation	
Video demonstration	



Decision support tools

Farm-specific assessments

Farm conditions change

Decisions should adjust

Every farm is different



**Market conditions
change permanently**

Prices and cost
impact decisions



**Applications should
be user-friendly**

Still scientifically sound
and robust

DairyMGT.info

Established in 2008

Mechanism to deliver

Science-based,
user-friendly,
and
practical-application
**decision support
tools**

Google Analytics

Registered in
December 2009



Google Analytics

Own Tracking system

Implemented in
March 2011

*Dairy
Management*



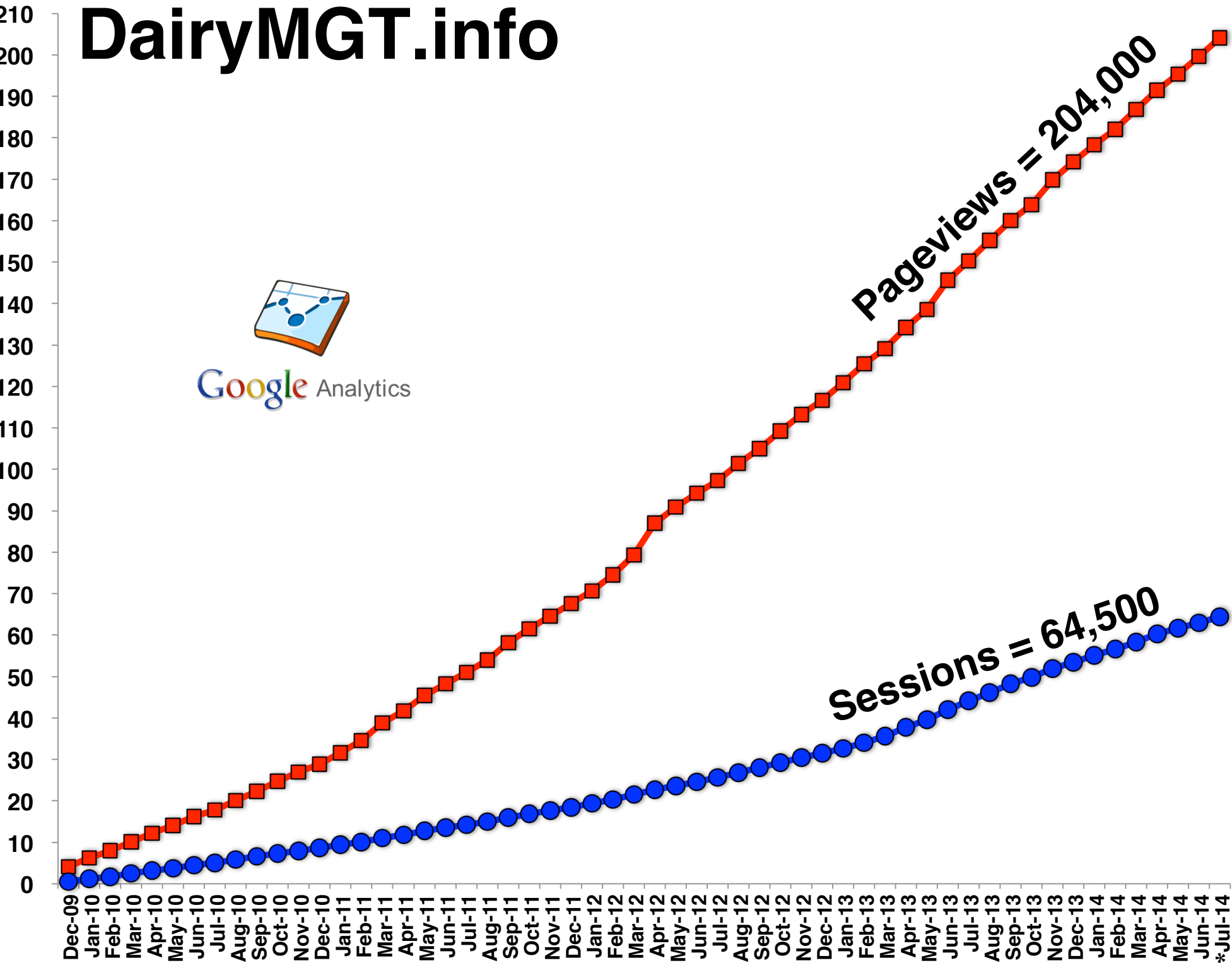
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Google Analytics

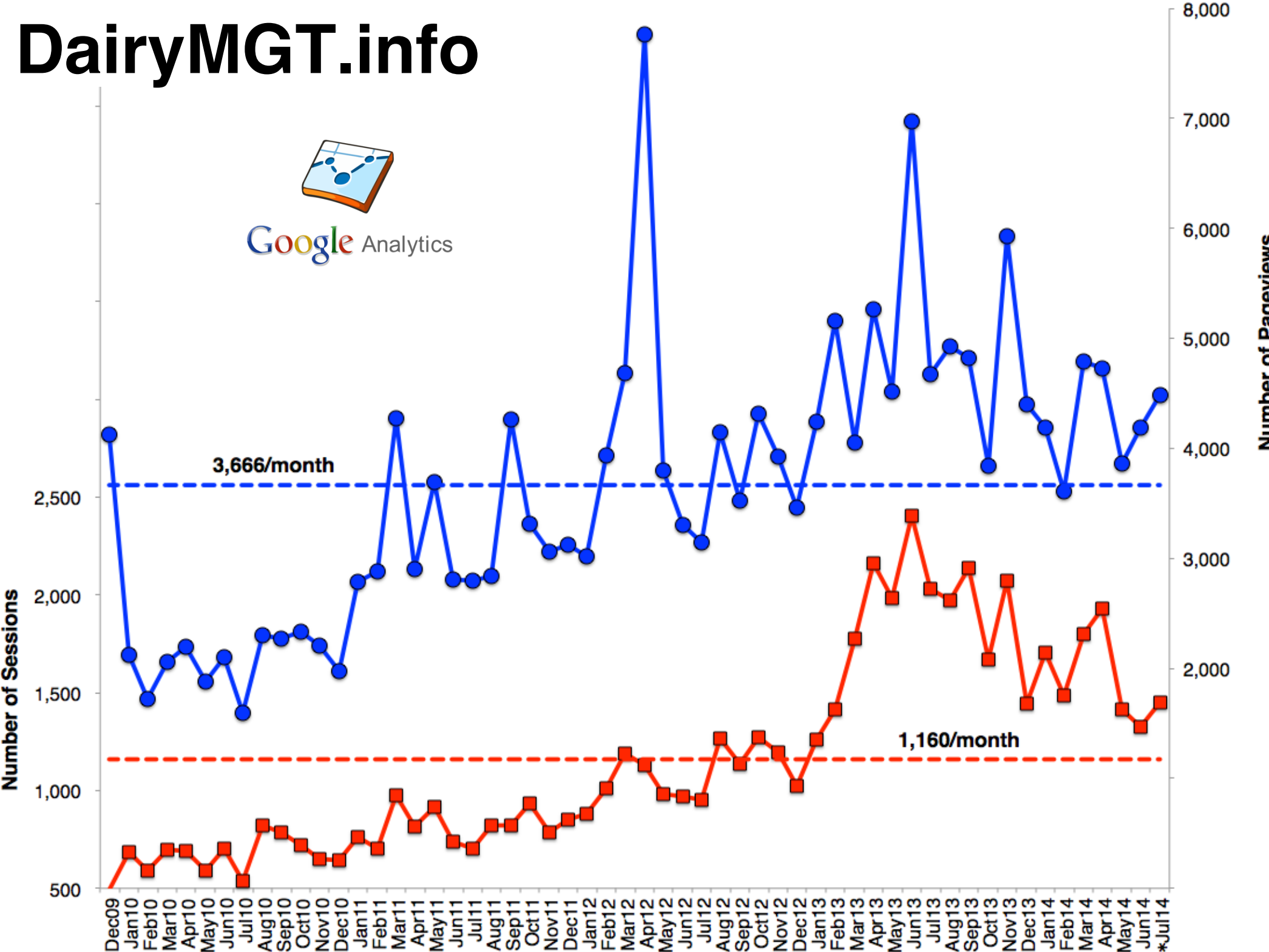
Sessions and Pageviews (1,000)



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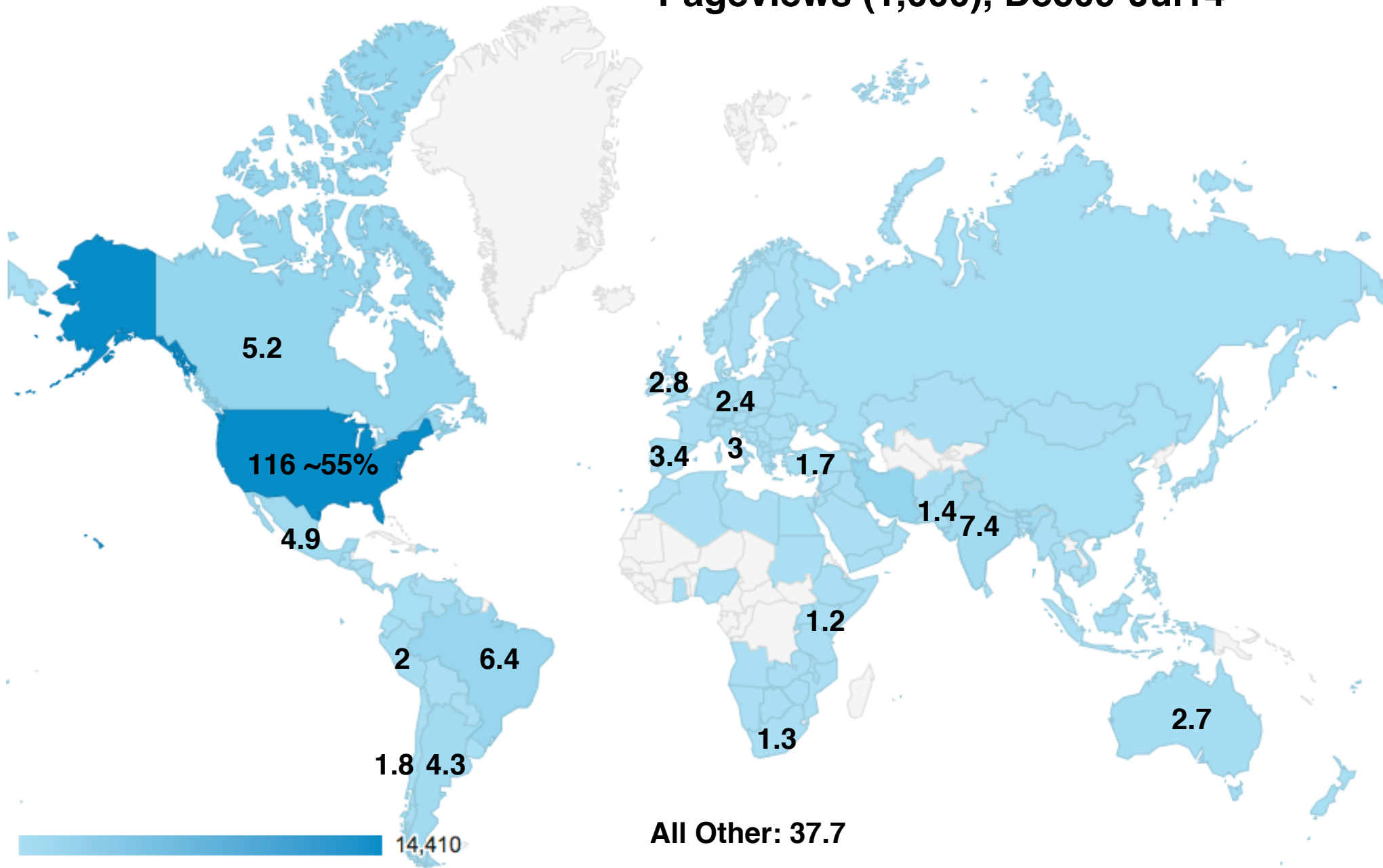


Google Analytics



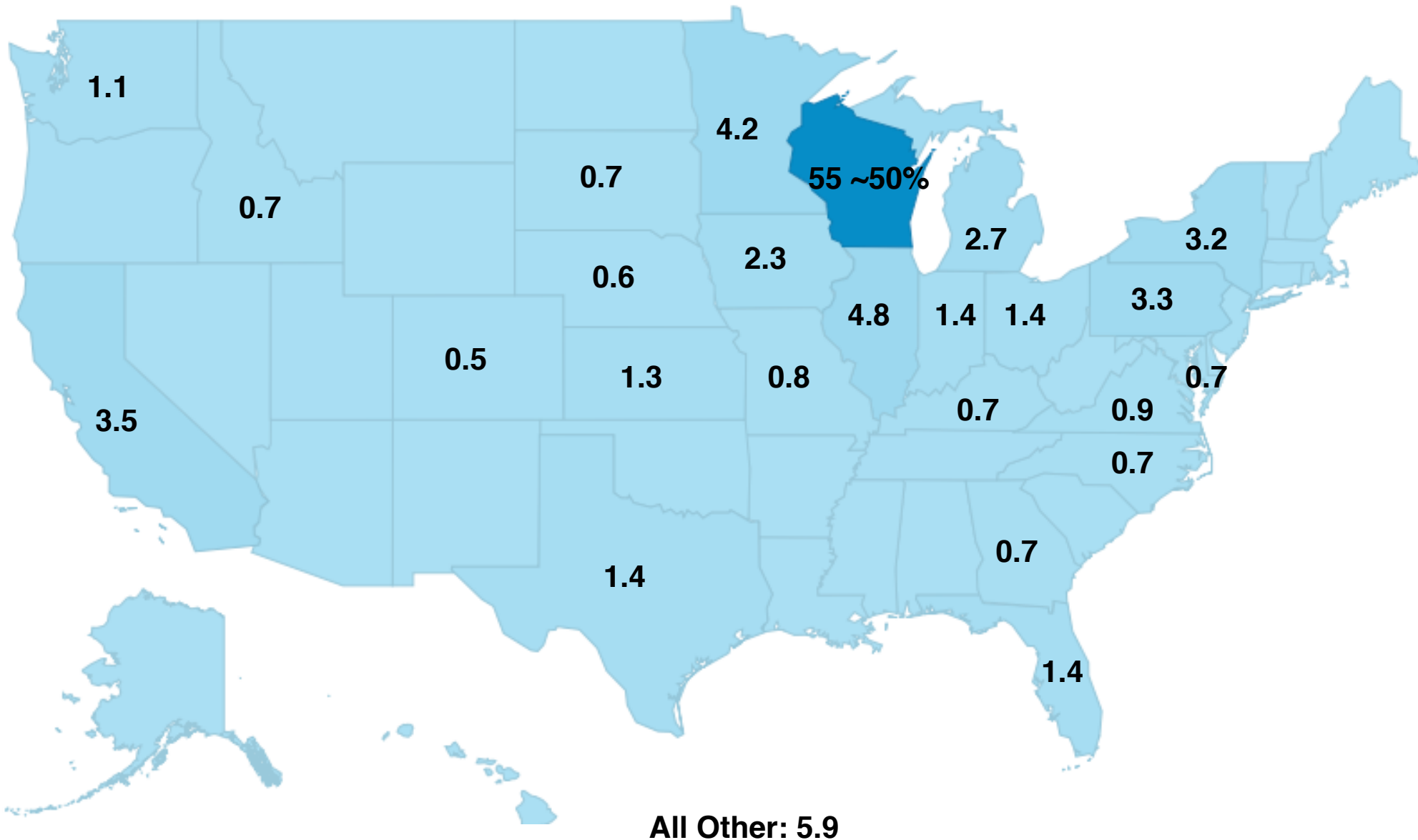


Pageviews (1,000), Dec09-Jul14





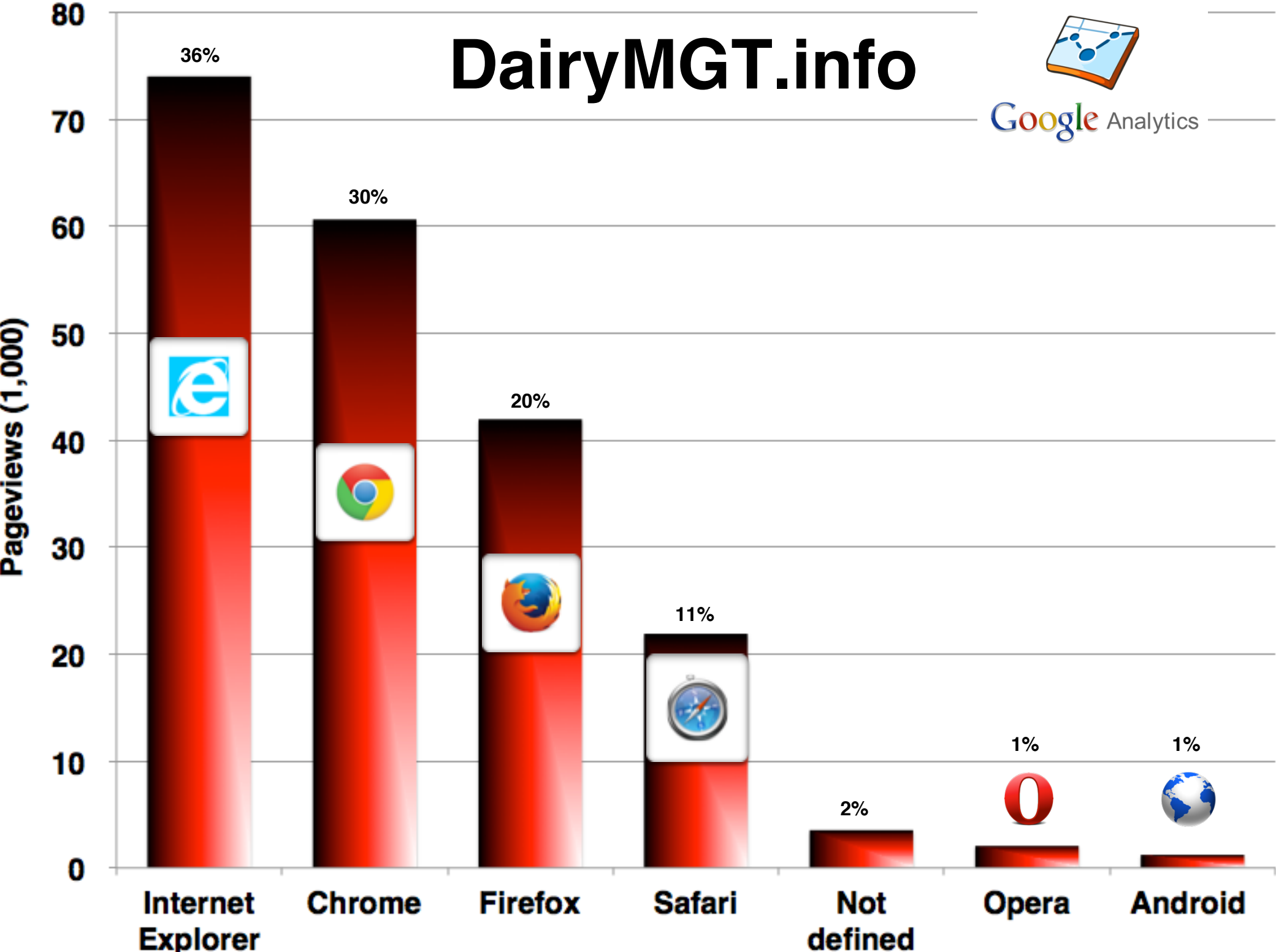
Pageviews (%), Dec09-Jul14

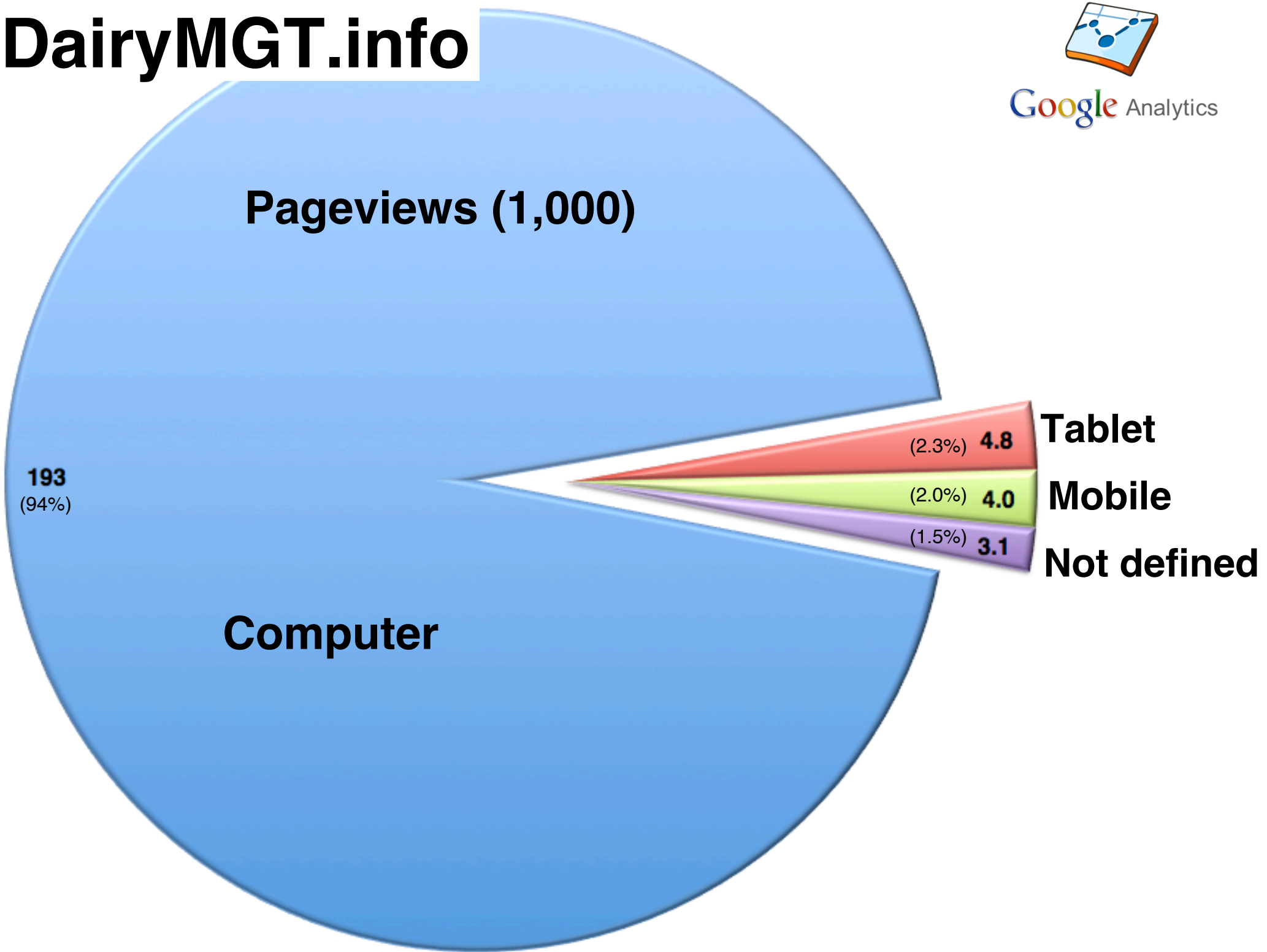


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DairyMGT.info: Email lists

Welcome to the Dairy Management Tool Suite

Please provide us with an email address to keep you updated. You will not receive any promotional email from us.

You will be re-directed to the tool once you have provided an email address.

Email address:

Submit

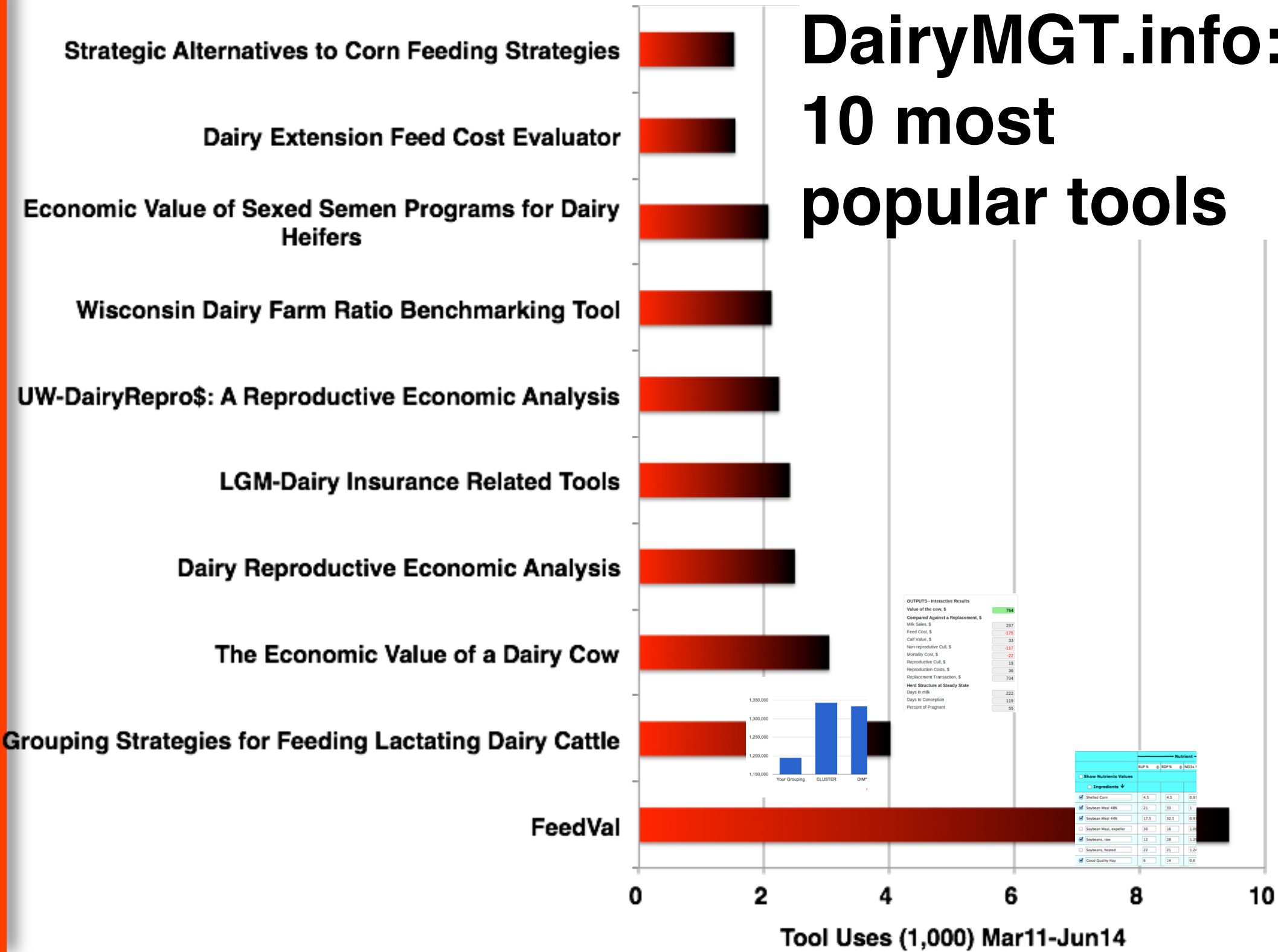
Thank you.

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	Total	Monthly
Total email registered	>6,000	>150
FeedVal email list	>2,000	>50

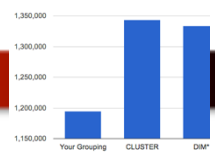
Decision Support Tool	Mar 11 to Aug 11	Sep 11 to Feb 12	Mar 12 to Aug 12	Sep 12 to Feb 13	Mar 13 to Aug 13	Sep 13 to Feb 14	Mar 14 to 10 Jul 14	Grand Total
1. LGM-Dairy Insurance Related Tools	658	658	399	362	168	146	20	2,411
2. Economic Value of Sexed Semen Programs for Dairy Heifers	78	167	1,406	239	107	69	1	2,067
3. Wisconsin Dairy Farm Ratio Benchmarking Tool	769	504	177	211	140	200	118	2,119
4. Dairy Reproductive Economic Analysis	528	501	359	278	283	286	256	2,491
5. UW-DairyRepro\$: A Reproductive Economic Analysis	338	251	574	660	78	279	59	2,239
6. Grouping Strategies for Feeding Lactating Dairy Cattle	161	288	691	889	953	732	303	4,017
7. FeedVal	-	-	961	2,320	1,566	3,039	1,537	9,423
8. Strategic Alternatives to Corn Feeding Strategies	319	334	266	297	211	82	13	1,522
9. The Economic Value of a Dairy Cow	-	-	424	741	618	935	321	3,039
10. Economic Analysis of Switching from 2X to 3X Milking	140	339	267	290	185	90	77	1,388
11. Optigen® Evaluator	277	205	230	163	78	28	-	981
12. Heifer Replacement	236	214	223	263	111	96	24	1,167
13. Milk Curve Fitter	17	296	266	220	126	106	49	1,080
14. Lactation Benchmark Curves for Wisconsin	205	209	86	232	101	106	37	976
15. Heifer Break-Even	182	163	144	263	118	96	26	992
16. Decision Support System for DairyExpansion	147	105	97	137	50	56	27	619
17. Herd Structure Simulation2	31	197	125	178	49	64	28	672
18. Dairy Extension Feed Cost Evaluator	-	43	305	450	286	332	123	1,539
19. Cost-Benefit of Accelerated Liquid Feeding for Calves	102	128	83	85	51	43	-	492
20. Milk Component Price Analysis	116	127	67	64	18	36	12	440
21. Exploring Timing of Pregnancy Impact on IOFC	104	91	108	117	82	46	-	548
22. Dairy Ration Feed Additive Break-Even Analysis	102	136	46	235	61	83	8	671
23. Dynamic Dairy Farm Model	64	92	119	106	37	41	5	464
24. Economic Evaluation of using rbST	32	58	100	93	57	55	15	410
25. Dairy Nutrient Manager	49	49	55	99	22	32	9	315
26. Grazing-N: Nitrogen Balance in Grazing Systems	55	42	26	27	17	15	1	183
27. Working Capital2	-	-	117	77	8	15	10	227
28. Alfalfa Yield Predictor	33	21	32	46	13	11	7	163
29. Heifer Pregnancy Rate	-	-	-	-	502	356	259	1,117
30. Other	300	314	145	372	162	507	216	2,016
Grand Total	5,043	5,532	7,898	9,514	6,258	7,982	3,561	45,788

DairyMGT.info: 10 most popular tools



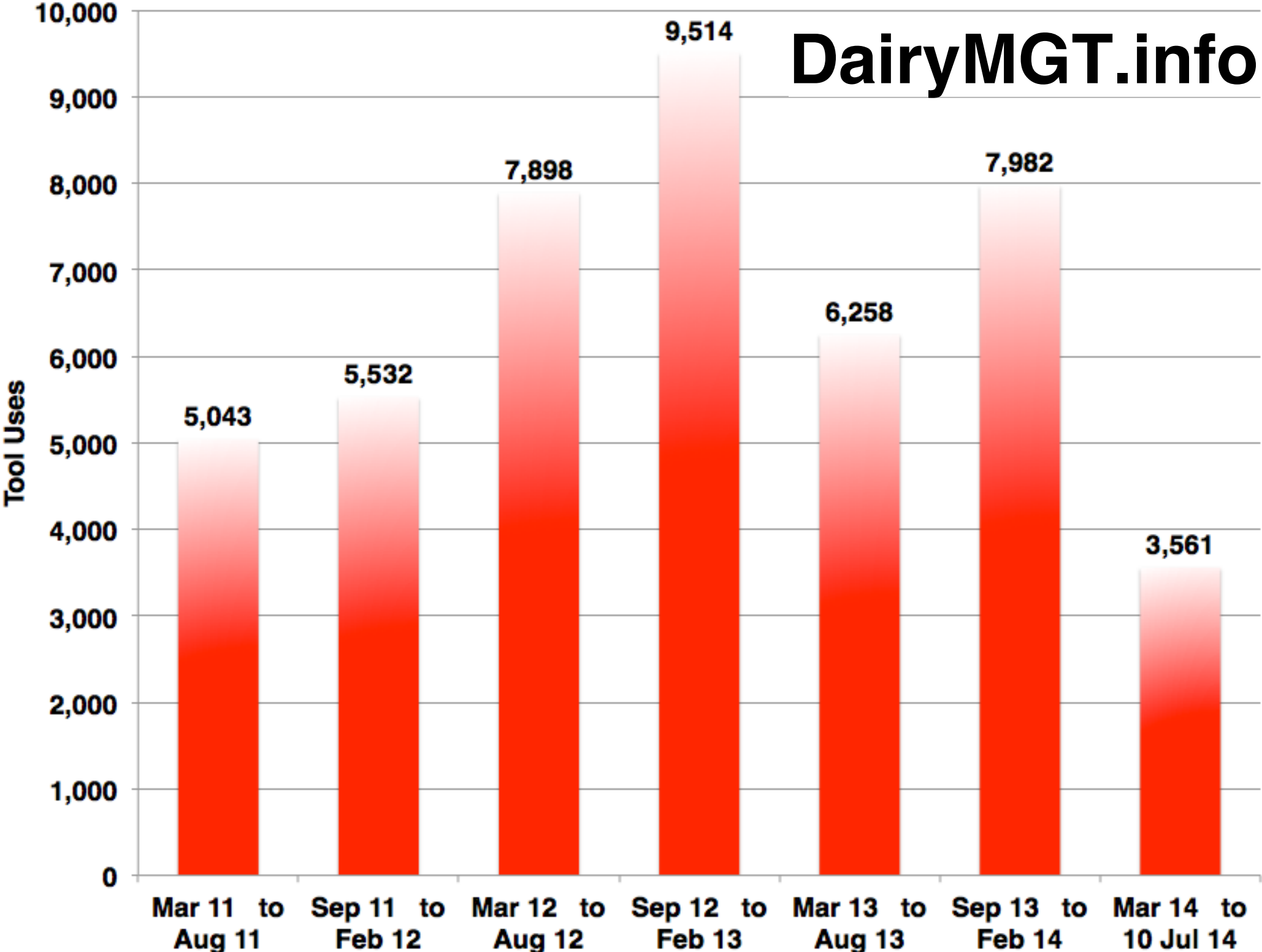
OUTPUTS - Interactive Results

Value of the cow, \$	764
Compared Against a Replacement, \$	
Milk Sales, \$	287
Feed Cost, \$	-175
Call Value, \$	33
Non-reproductive Cull, \$	-117
Mortality Cows, \$	-22
Reproductive Cull, \$	19
Reproduction Costs, \$	36
Replacement Transaction, \$	704
Herd Structure at Steady State	
Days in milk	222
Days to Conception	119
Percent of Pregnant	55

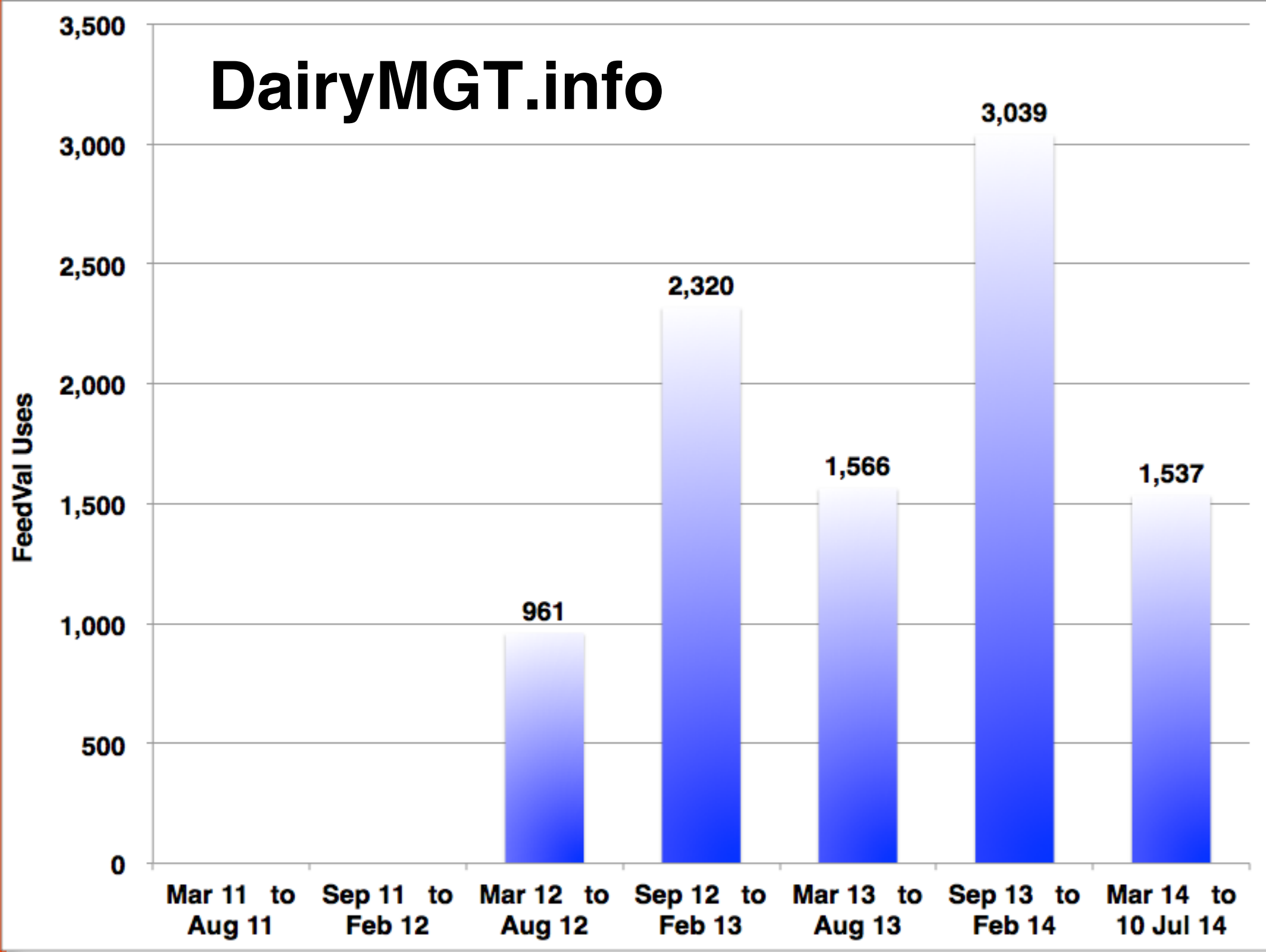


	Feed N	ADP N	NET N
<input checked="" type="checkbox"/> Show Nutrients Values			
<input checked="" type="checkbox"/> Ingredients			
<input checked="" type="checkbox"/> Shelled Corn	4.3	4.3	0.91
<input checked="" type="checkbox"/> Soybean Meal 48%	21	19	1
<input checked="" type="checkbox"/> Soybean Meal 46%	17.5	32.1	0.9
<input type="checkbox"/> Soybean Meal, expeller	18	18	1.05
<input checked="" type="checkbox"/> Soybeans, raw	12	28	1.2
<input type="checkbox"/> Soybeans, heated	22	21	1.24
<input checked="" type="checkbox"/> Good Quality Hay	6	14	0.6

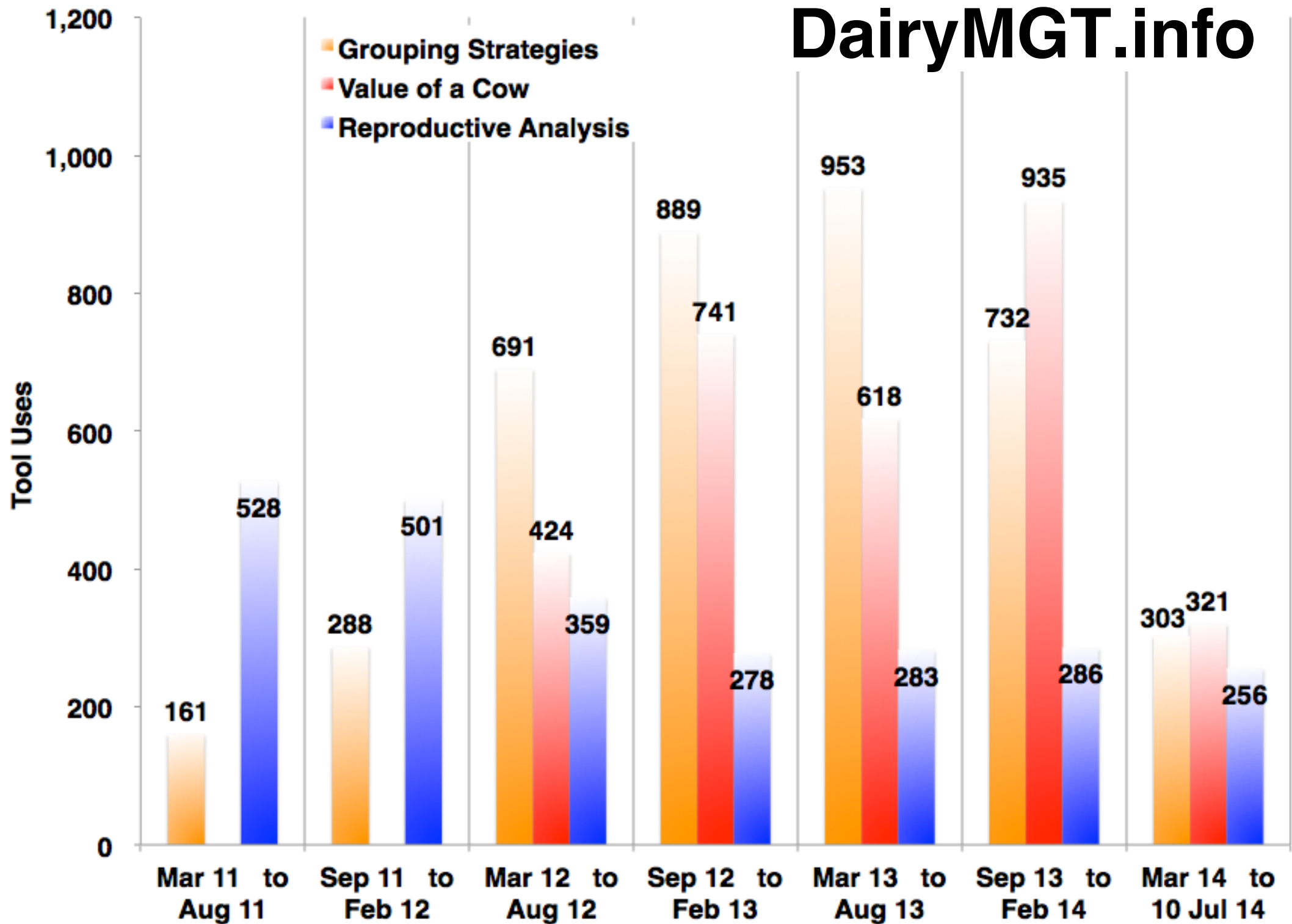
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DairyMGT.info: Units and languages

Tool	Units	Language
Economic value of sexed semen	Arg\$	 
UW-Dairy Repro	Arg\$	
Income over feed supplement	metric, Arg\$	
Heifer replacement, 2X to 3X milking	metric	
Economic value of a cow	metric, £	
FeedVal	metric	
CholiPEARL	metric, R\$, €	 

DairyMGT.info: Talks since 2009

Audience	Presentations	Attendees
Wisconsin	130	>3,500
US - Other States	34	>2,300
Other Countries*	90	>6,000
Total	254	>11,800

*Country (times): Argentina (4), Brazil (1), Canada (2), Chile (2), Czech Republic (1), Honduras (1), Kosovo (1), Mexico (5), Peru (3), Spain (3)

ReproMoney

"This project is supported by Agriculture and Food Research Initiative Competitive Grant no. 2010-85122-20612 from the USDA National Institute of Food and Agriculture."



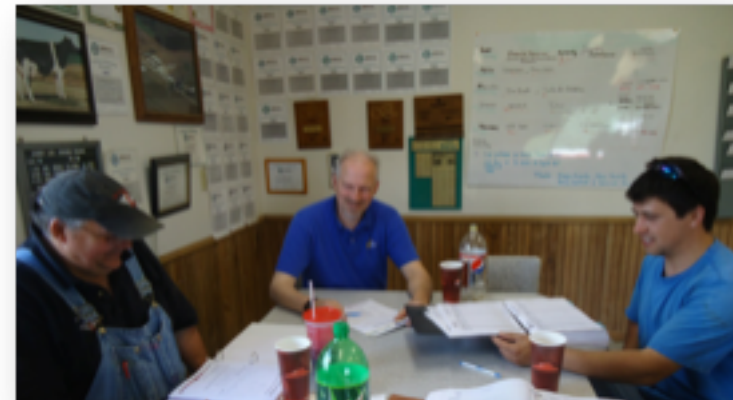
Team-based program

To improve reproductive performance



Farm-directed team

Farmer and advisors working together with common goals



Self-operated

Facilitated by UW-Dairy Science:
María C. Cordoba



Assessing and improving repro

Frequent meetings

Managers and advisors with specific focus on reproduction



Action items

- Baseline performance levels
- Detect problems
- Set goals and target dates
- Responsibilities of each team member
- Evaluate progress
- Monitor improvement
- Motivate change

Team members

Manager, owner, veterinarian, nutritionist, extension agent, etc.

Looking at the big picture

Reproduction is multifactorial

Many other areas of management are involved



Improvements

- Overcrowding and cow comfort
- Health issues
- Heat stress
- Nutrition
- Genetics and genomics
- Milk quality
- Reproduction programs
- New technologies in reproduction
- ...

Participant additional benefits

Group of committed advisors

From UW-Dairy Science and other departments

Decision support tools available

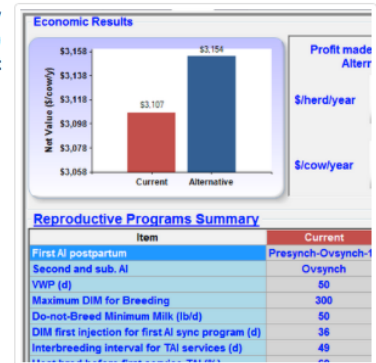
Support in the use and application of tools

> [Wisconsin-Cornell Dairy Repro: A Reproductive Programs Economics Analysis Tool.](#)
[Replaces previous tools UW-DairyRepro\\$ and UW-DairyRepro\\$Plus.](#)

The UWCU-DairyRepro\$Plus is a PC-Based tool that implements a complex daily Markov chain model inspired on Giordano et al., 2012 (J. Dairy Science 95:5442) that simulates all cows in a herd and their economics, and computes the net return associated to reproductive performance parameters.

Installer package (Microsoft Windows) ([Download](#))

Instructions and Documentation ([Download](#))



> [Heifer Pregnancy Rate](#)

Calculates the true heifer pregnancy rate of a herd.

Online Tool ([Open](#))

Excel Spreadsheet ([Download](#))

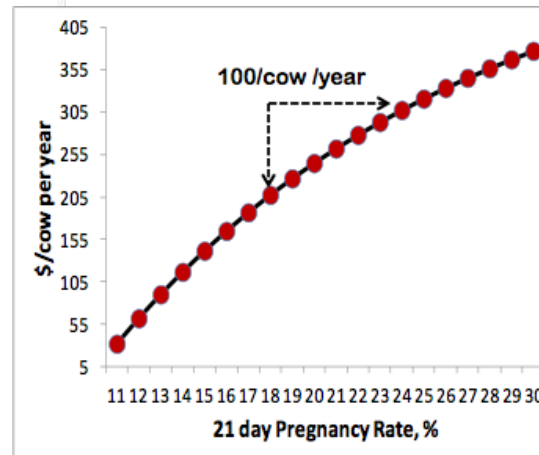
A snapshot of the tool.

Calving Age (Averages and Variance)

Statistics Summary		Your Herd	C
Average age @ first calving, mo	23.7	23	
Minimum calving age, mo	21.6		
Maximum calving age, mo	27.1		
Heifers calving/year, n	85		
Calving age deviation, mo	1.1	<	
Kurtosis	1.4		
Skewness	1.1		

Range and Variance

Youngest calving age (typical), mo	22.1	>
Oldest calving age (typical), mo	26.4	<
Calving age range (typical), mo	4.3	<
Days on feed variance, d	131	<
Calving body weight variance, lbs	0	<



Enrollment statistics

Item	Value	Range
Farms enrolled, number	42	
Farms that finished, number	36	
Farms in progress, number	3	
Herd size, number of cows	453	50 - 2,700
Rolling Herd Average, lb/cow.yr	25,977	14,071 - 32,446
Milk production, lb/cow.d	83	45 - 105
All goals set reached, %	78	
Continue team meetings, %	80	
Team members, number	5	2 - 10
Extension agent in team, %	100	
Veterinarian in team, %	100	
Nutritionist in team, %	94	
Duration of ReproMoney, months	9	4 - 16

Reproductive efficiency

Item	ReproMoney		Improvement Because ReproMoney	p-value
	Before	After		
21-d Pregnancy Rate*, %	19 (7-29)	22 (11-30)	3	<0.0001
Service Rate, %	53 (30-70)	56 (42-70)	3	0.007
Conception Rate, %	36 (21-60)	36(21-48)	3	0.5
Cows serviced 21-d past Voluntary Waiting Period, %	78 (39-100)	87 (55-100)	9	0.004
Inter-breeding interval, d	44 (29-64)	41 (29-56)	-3	0.03
DIM for milking cows, d	187 (244-152)	179 (209-142)	-8	0.02

*58% (21/36) farms improved pregnancy rate, 22% (8/36) maintained same pregnancy rate

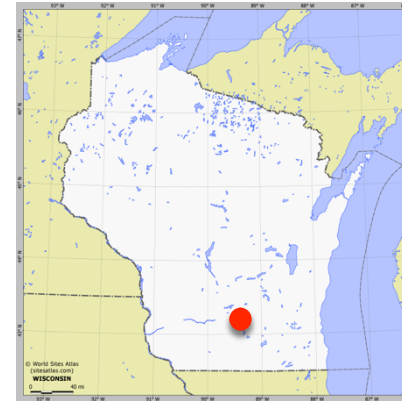
Estimated Economic Gain

Item	Value	Range
Economic Gain, \$/cow.yr	61	11 - 165
Economic Gain, \$/herd.yr	16,865	1,188 - 56,364
Gain of participants, \$/year	354,165	

Success story

Dairy farm in South Central Wisconsin

- 400 cows
- 28,000 lb/cow.yr



Description of original reproductive program

- Double Ovsynch for first service
- Ovsynch for second and subsequent services
- Heat breeding in between re-synchronizations
- Main goal: Improve their 18% 21-d pregnancy rate



Success story

Improvements made by team consensus

- Record and treat cystic cows with 7-d CIDR Synch protocol
- Changed OvSynch-48 to OvSynch-56 to better sync AI to ovulation
- Focus on transition:
 - Stall improvements
 - 15% more bedding stalls
 - Special care to heifer reproductive program

Outcomes after a year

- 21-d Pregnancy Rate = 24%
- Economic gain a year = \$100/cow = \$40,000/herd
- Team-based still part of dairy management program



Thanks