9 **Billion** People

By 2050

4.2 **Billion** People

Will enter the mainstream consumer class by 2025 (up from 2.5Bn in 2010)

3000 Liters in 2014

The average water footprint of a typical consumer

Sustainable?

Making Sense from Sensor Data

Yasir S Khokhar

CEO

Connecterra

Smart Farming for Europe

Value creation through Precison Livestock Farming

Agenda

Trends driving innovation in technology

The paradox of data

A case study in making sense from sensor data

Why this matters

Emerging trends in technology today

Sensors:

Smaller, powerful, autonomous, long range and battery life.

The average iPhone has 14 sensors in it.

Data Technologies:

Zettabyte scale, processing billions of records per second (NSA/Google)

Cloud Computing:

Dropping cost of cloud based resources as economies of scale make their effects felt. Near Infinite storage and near infinite compute resources.

3 node compute cluster: $100K in 2000 -> Down to $45 / month in 2016

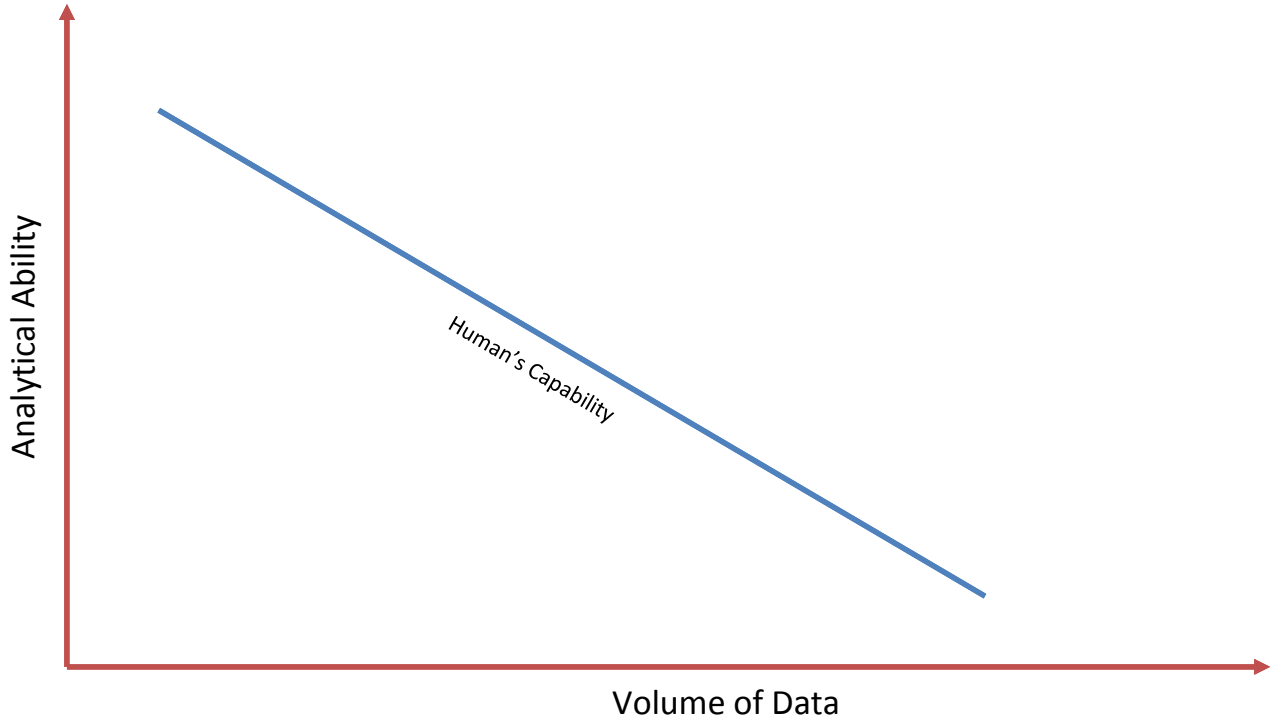
We don’t really need more data

The advertising industry is well and kicking with over $1Tr of market cap

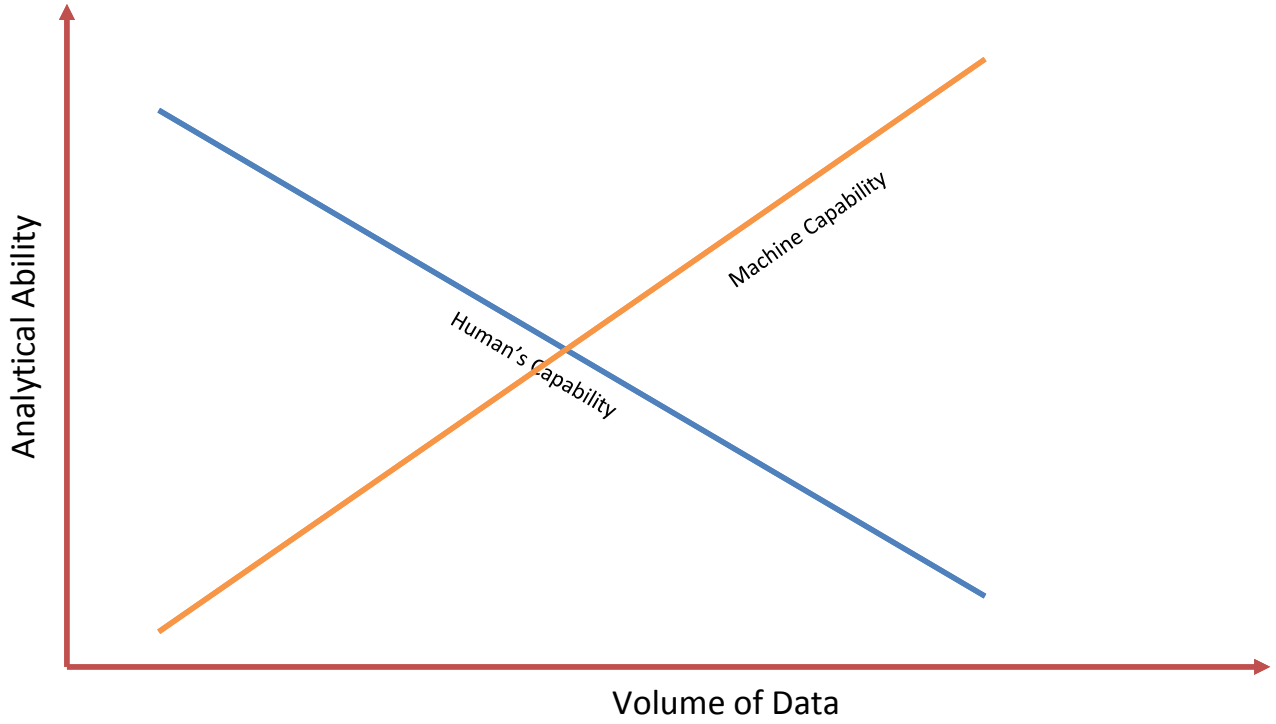
We need more insights

And insights need data; quality and volume

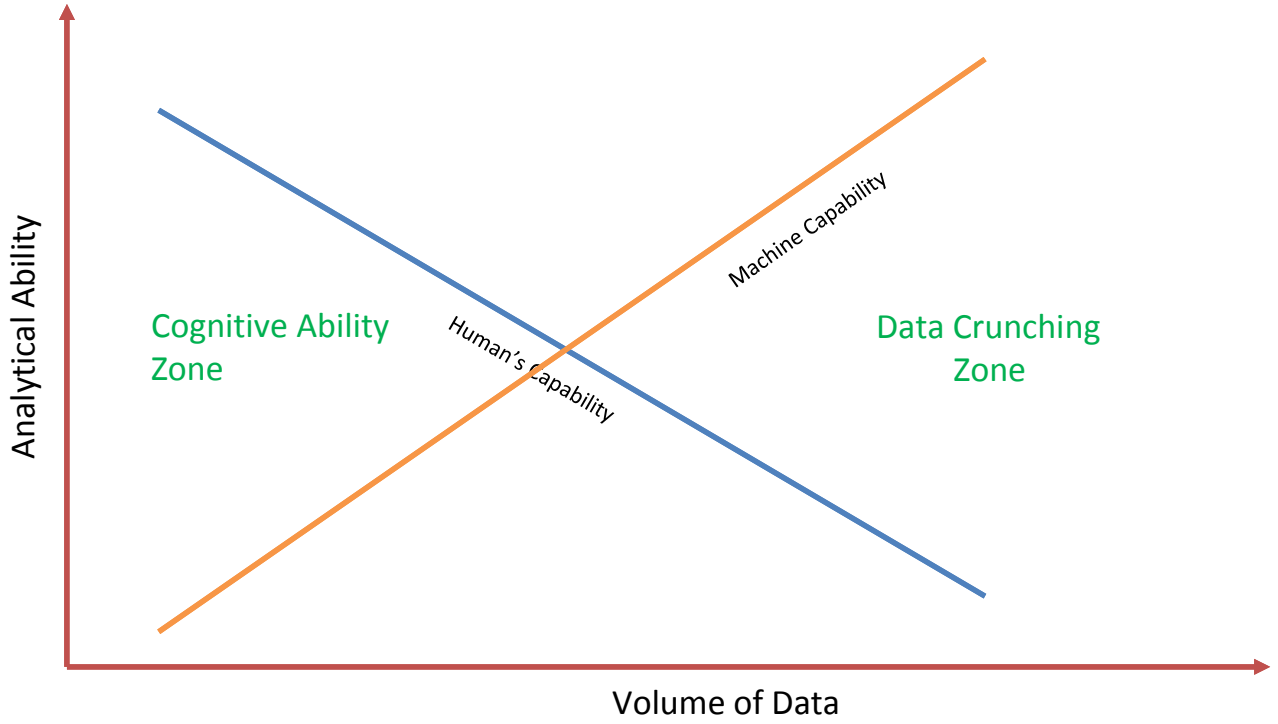
The Paradox of data analysis



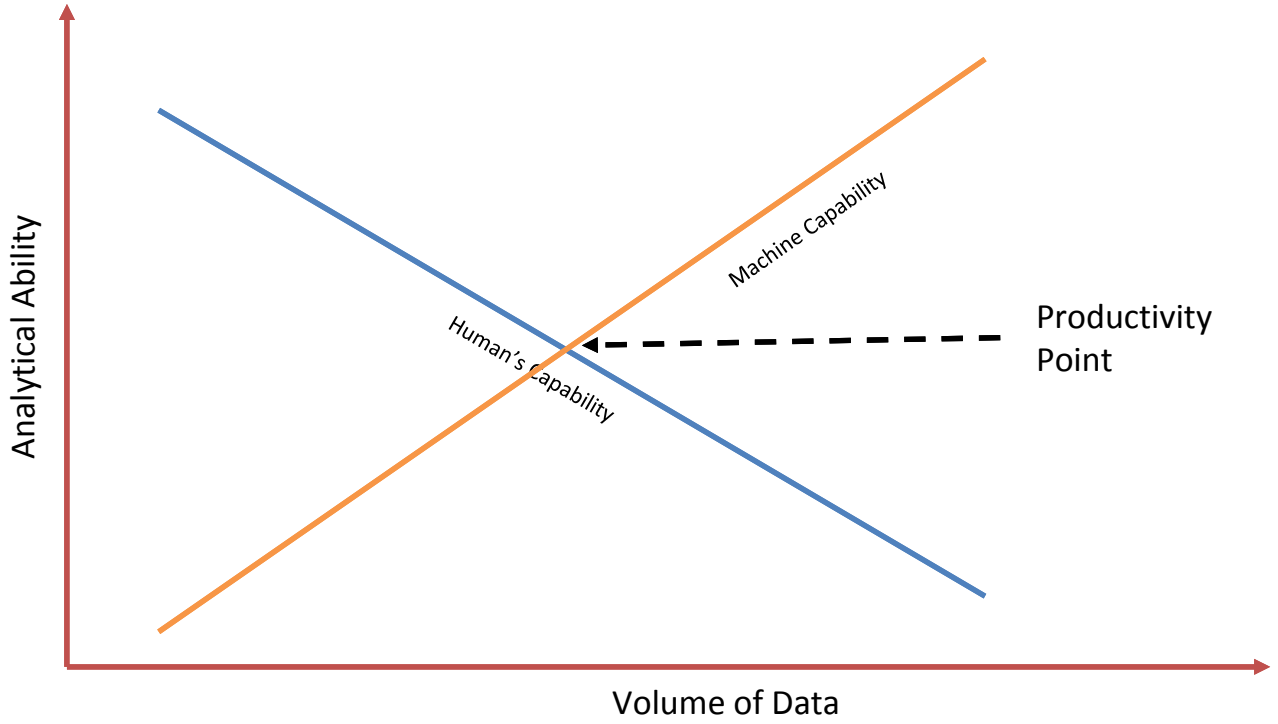
The Paradox of data analysis



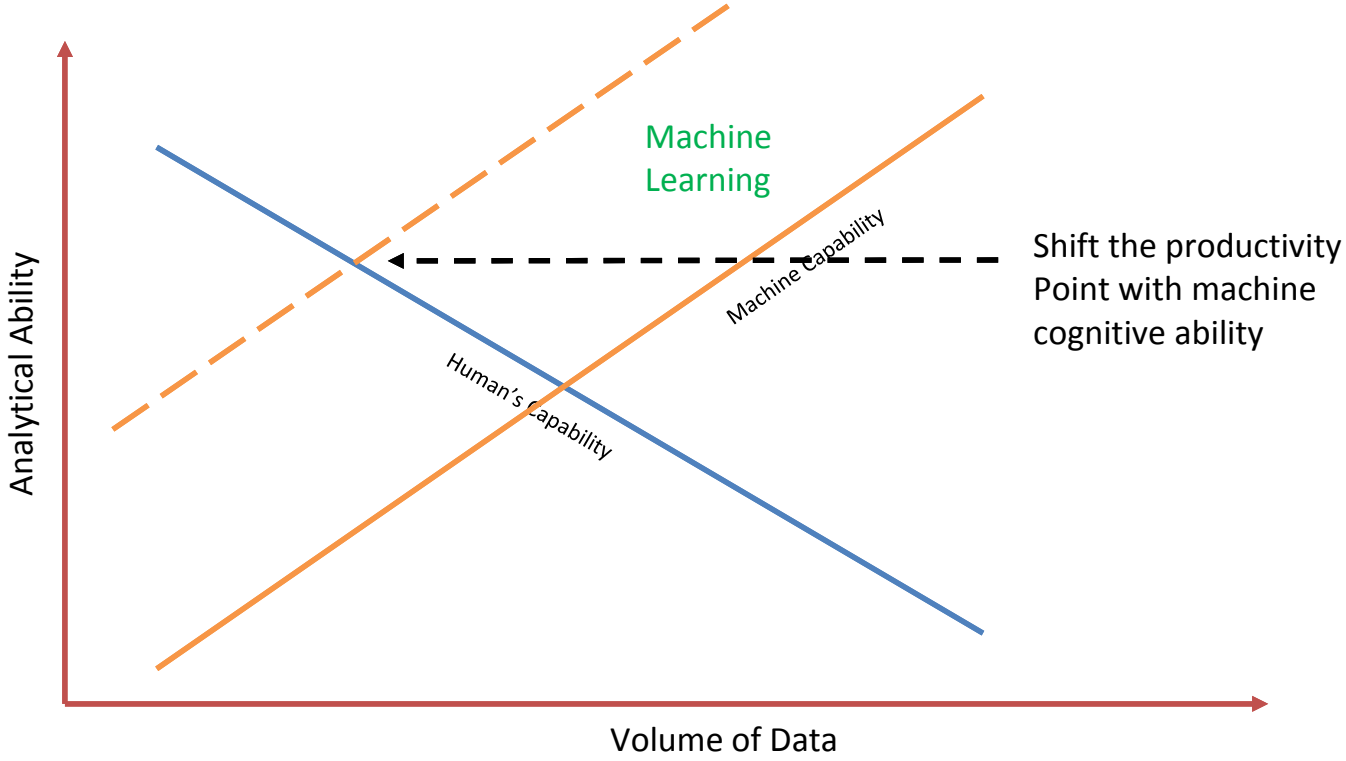
The Paradox of data analysis



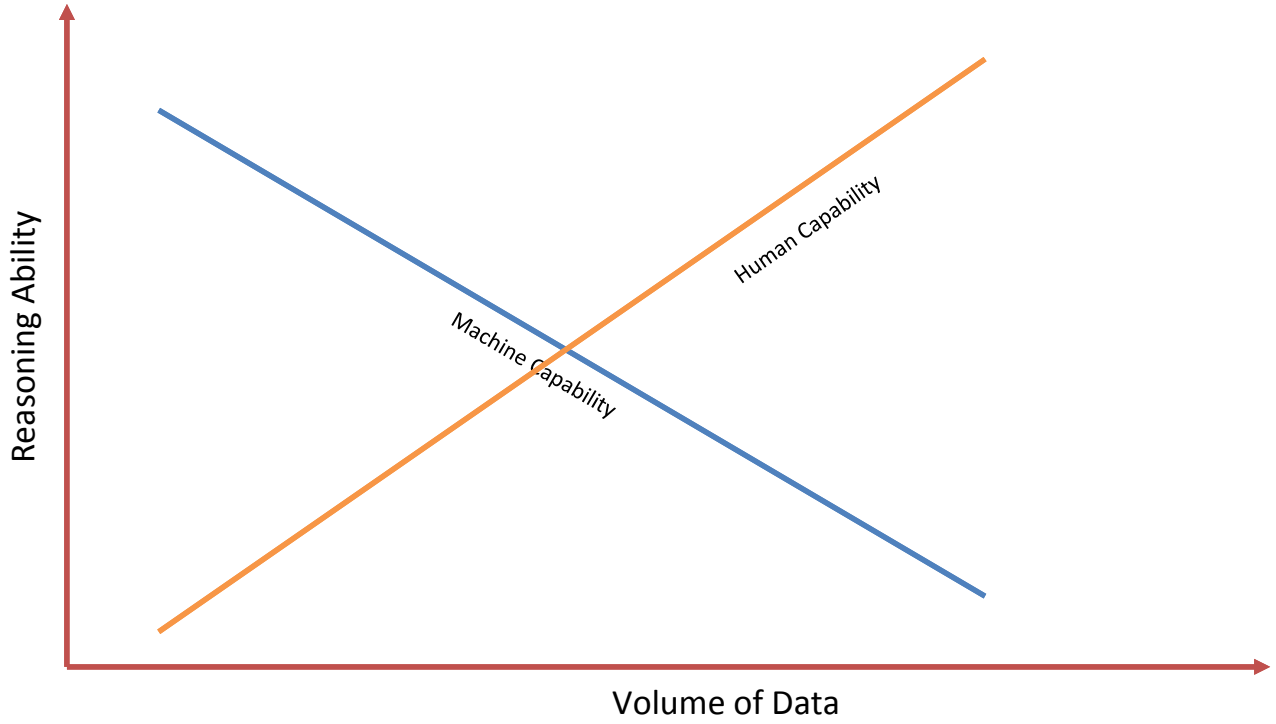
The Paradox of data analysis



The Paradox of data analysis



But the trick is in asking the right question!

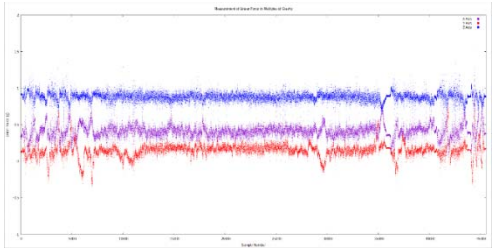


Process large amounts of data with reasoning ability = Insights

…..the year so far in the machine learning world

Connecterra:

Learn the behavior of dairy cows by observing their behavior:
Eating, Ruminating, Drinking, Walking, Idle (and more)

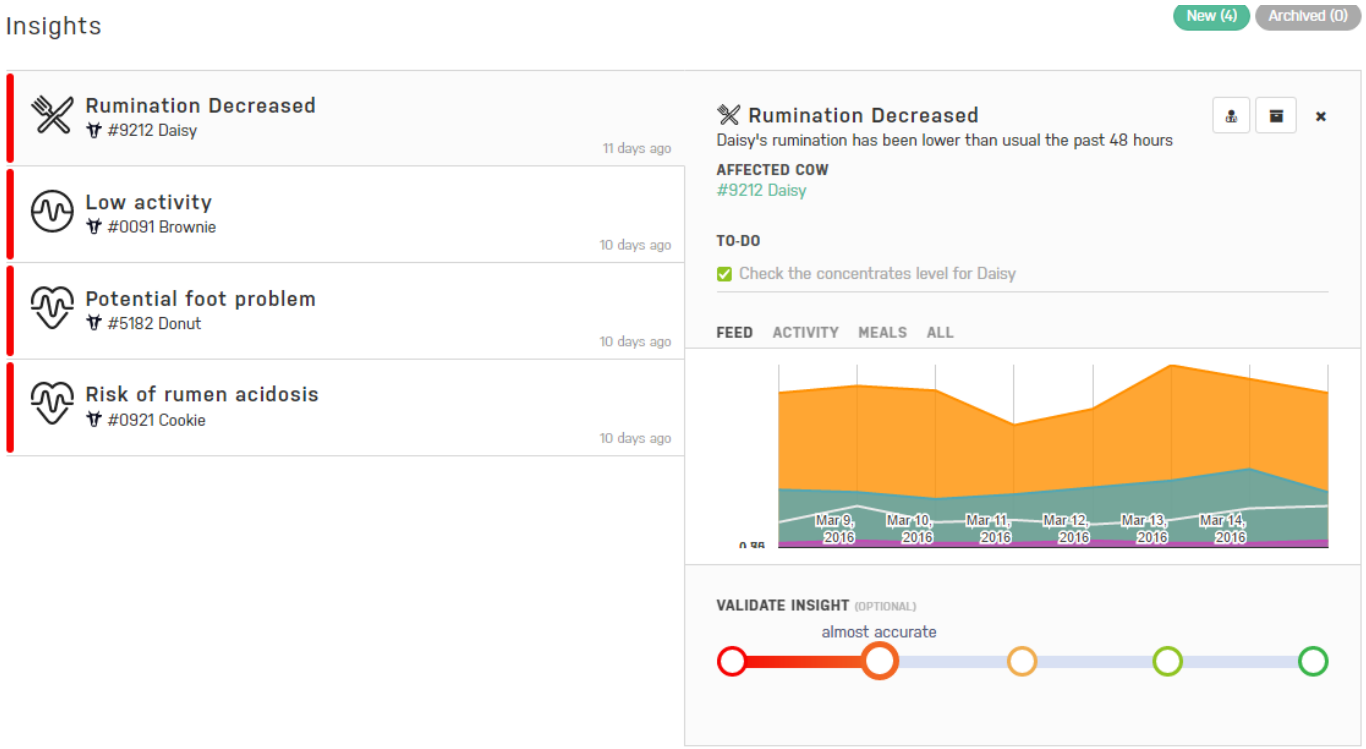


Cow shows an unusual eating behaviour.
#9998 Oh Well

Sensor Data

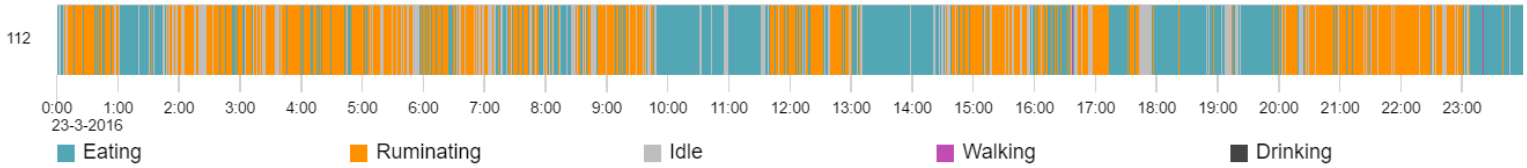
Insights

An example of what we found

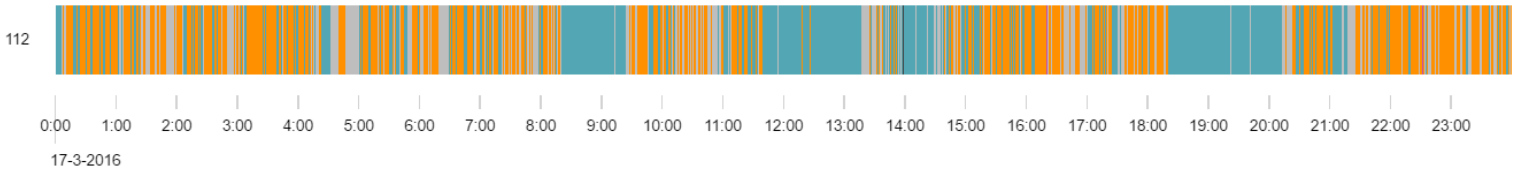


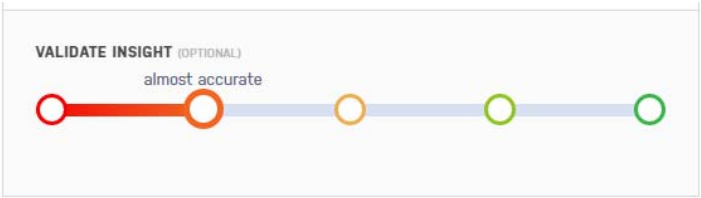
Farmer gives fresh food on 10:00 every day.
Pushes food back to gates in afternoon, 18:00 and 23:00.

Typical patterns for Daisy



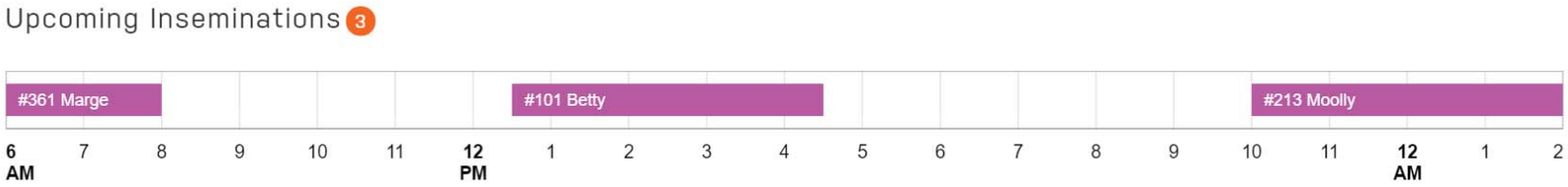
After a change in feed input





Including the farmer in the feedback loop creates cognitive ability of the system

A system that has cognitive awareness also has predictive capabilities



Predicting estrus cycles and optimal insemination time is based on the learning from past experiences

A system that has predictive abilities and massive scale gets better with multiple forms of data

Additional sensors

Financial Data

Partner Data

Help us feed the world by 2050,
Spread the word

www.connecterra.io

Thank you.

Acknowledgments and Disclaimer

This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement n° 311825


EU - PLF

What farm practices do I employ that have the biggest impact on productivity?

How do I compare to other farmers in my region?

Are my suppliers products as good as they say they are?

How do I operate my business in a more sustainable manner for a better planet?

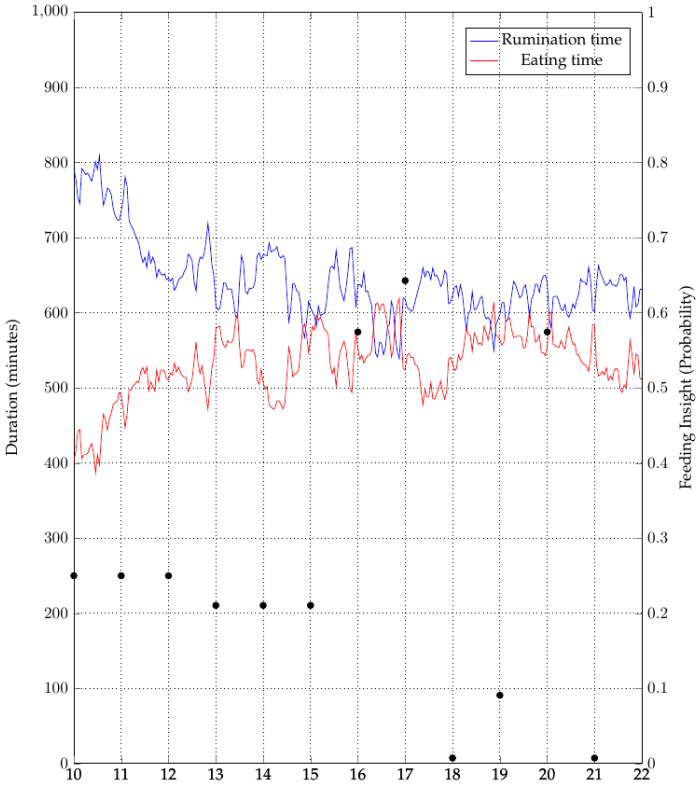
Projected Dairy Cash Flow Analysis

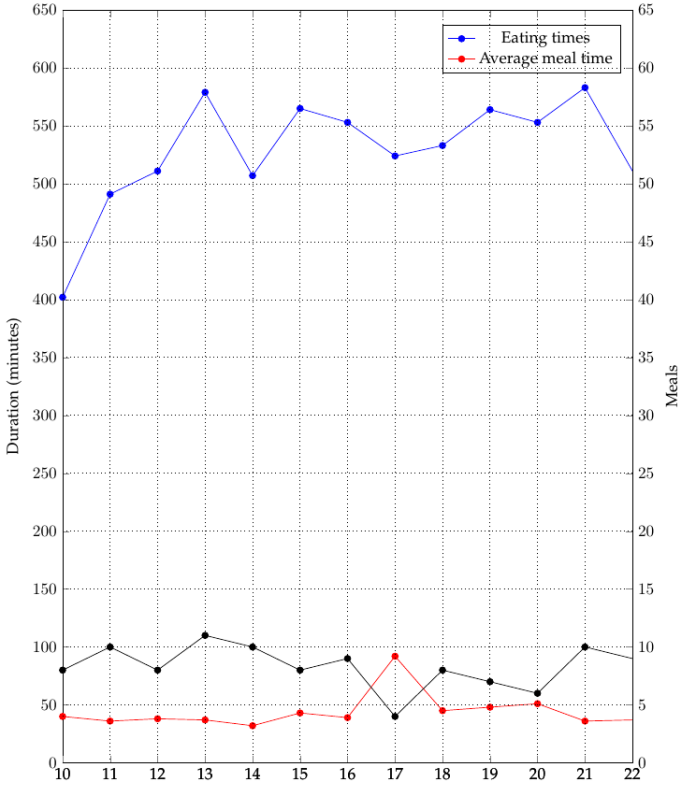
Input information from your dairy operation in the yellow boxes. The worksheet will calculate income and expenses. Information is not saved in this form so use the Print Button to capture the results.

		Update	*Default*		*Values Used in model*			
1	Price Per CWT	12.00	14.20		12.00			
2	CWT Per Cow	263.00	263.00		263.00			
3	Herd Size	150.00	6,000.00		150.00			
	Dairy Sample Data							
	INCOME	AMOUNT	PER CWT	PER COW	PERCENT			
4	Milk	$473,400	$12.00	$3,156	100.00			
5	Total Income	**$473,400**	**$12.00**	**$3,156**	**100.00**			
	EXPENSES							
	Feed						*Update*	*Default Values Per cow*
6	Hay	19,500	0.49	130	4.12			$130
7	Silage	58,800	1.49	392	12.42			$392
8	DDG - Gluten	14,700	0.37	98	3.11			$98
9	SBM - Soybest	21,300	0.54	142	4.50			$142
10	Grain	21,450	0.54	143	4.53			$143
11	Other Feed - Supplements	36,300	0.92	242	7.67			$242
12	**Total Feed Expenses**	**$172,050**	**$4.36**	**$1,147**	**36.34**			
	Herd Replacement Cost							
13	Depreciation - Dairy Cows	34,950	0.89	233	7.38			$233
14	Other Costs	16,200	0.41	108	3.42			$108
15	**Total Herd Replacement Cost**	**$51,150**	**$1.30**	**$341**	**10.80**			
	Other Operating Expenses							
16	Interest and Rent	31,200	0.79	208	6.59			$208
17	Labor plus Benefits	48,125	1.22	321	10.17			$321
18	Depreciation – Other	22,950	0.58	153	4.85			$153
19	Milk Hauling	10,050	0.25	67	2.12			$67
20	Industry Assessments	6,300	0.16	42	1.33			$42
21	Supplies	25,050	0.63	167	5.29			$167
22	Repair and Maintenance	21,750	0.55	145	4.59			$145
23	Utilities	8,700	0.22	58	1.84			$58
24	Taxes and Licences	6,600	0.17	44	1.39			$44
25	Insurance	6,450	0.16	43	1.36			$43
26	Fuel and Oil	7,588	0.19	51	1.60			$51
27	Legal and Accounting	3,600	0.09	24	0.76			$24
28	Veterinary and Breeding	12,900	0.33	86	2.72			$86
29	Testing and Trimming	3,900	0.10	26	0.82			$26
30	Hauling Livestock	900	0.02	6	0.19			$6

Help a farmer manage the top and bottom line by using the power of predictive analytics

Cow shows an unusual eating behaviour.





Ruminationtion ratio is relatively low. Increasing eating times.
Decreasing rumination ratio over last week. Sudden drop in meals.