



The Big AHA = Awareness Humility Action



1900 ... 1 automobile in NYC



13 years later ... the move to automation was nearly complete.

We poised to live thru a similar transition ... if you don't want to be in the horse trade, you will need to unlearn many things about your business.

Most standard processes and tasks will executive by systems that are data driven, cognitive and automated



## The world is changing fast.



December 2017



Albert Straus, of Straus Family Creamery, beats Elon Musk to the punch with his full-scale electric truck that **runs on methane-generated electricity**.

This California organic dairy farmer is making a mooo-ve away from diesel fuel and toward more sustainable agriculture transportation with his fullelectric International Harvester truck that puts his cows' waste to work.

One major step on the pathway to a circular economy is finding ways to transform waste materials into feedstock for other products, whether that's as a raw material for production, or as a 'fuel' for generating energy. For dairy farms, the massive amount of cow manure produced by the cows each day can be either a bothersome byproduct that must be dealt with, or it can present a big opportunity. Sure, manure is readily turned into compost and soil amendments without a complicated process and specialized equipment, but there's only so much of that that one operation needs.

Another way that dairy farmers are converting their most voluminous 'crop' to meet a different need, energy, is through biodigesters that can essentially turn cow poop into clean electricity and heat for their operations.

At the Straus Family Creamery, a biodigester has been generating free power for onsite use, as well as charging the farm's electric Toyota RAV4 and Nissan Leaf, along with various smaller vehicles, since 2004, but the company has now added a major upgrade to the farm's renewable infrastructure – an electric semi-truck.



October 5, 2017

Translate 40 languages!

Do business in more than 60 countries?



August 2017

Cargill, Bill Gates and Richard Branson invest in Memphis Meats ... "clean meat"



**1 Quadrillion** 



Here is an example of 1000-fold growth that you have lived through.

Here are seven additional trends that are about to experience 1000-fold growth ...



December 5, 2016



Trend #1: Bandwidth/5G

4G ... 1400-fold faster

5G ... 100X faster than 4G (Download movies in second vs minutes)



Trend #3: Augmented reality

Apple Announcement ... just hours ago (Sep. 12, 2017)

Augmented Reality could be really big trend

ΤК

1 to 2 hours is now reduced to 20 minutes



General Mills "What's in my food"?



Dairy industry's "carbon footprint"

Nanotechnology helps milk bottles double the shelf life of milk!

Agirdus (Brazil company)



Nanostructured steel: Can instantly kills e coli bacteria

The researchers, hailing from Georgia Tech, created a form of stainless steel riddled with sharp bumps so tiny they can repel and kill bacteria, making the surface practically uninhabitable.





A self driving truck transporting self driving cars!



Still don't think autonomous vehicles are taking off?



GEA Monobox: Cameras and sensors can instantly analyze fat & protein content as well as milk color and temperature. The system automatically cleans and disinfects itself after milking every cow.



Trend #6: The Internet of Things

The extension of the Internet to the physical world.



Trend #2: Wearables

Cowlar ... smart neck collar for dairy cows



## Savings:

Deloitte's HQ in Amsterdam. World's smartest building-houses 2,500 people but only 1,000 offices.

The greenest building in the world

All told, the Edge is packed with some 28,000 sensors.

App knows individuals preference for lighting and heating

Makes best of humans!

"Hot design" ... 2500 workers but only 1000 desks

"We think we can be the Uber of buildings," says Coen van Oostrom, chief executive officer of OVG Real Estate, the building's developer. "We connect them, we make them more efficient, and in the end we will actually need fewer buildings in the world."



Connected cattle ...

What is possible with 5G



Cornell & IBM are now using gene analysis to help keep milk safe



Impact on budget deficits?



Food tailored for people: 50+, 60+, 70+, etc.

Opportunities for "value-added" milk?



Trend #7 The Genomics Revolution

CRISPR: Gene editing technology



Hornless cows/cattle

Cattle that are resistant to TB

Fewer antibiotics

Artificial intelligence: The future of the dairy industry?

Strauss Group (one of Israel's largest manufacturers of dairy products) is using AI to detect problems in machines

Some startups are beginning to offer broader AI systems that require neither a machine-learning expert nor a pre-trained system constructed by the likes of Google. Israel's n-Join sells manufacturers a small box that collects data from machines on an assembly line, and then uses machine learning to spot aberrations that could presage a breakdown.

The key to n-Join's utility, says Guy Tsur, a senior technologist at **Strauss Group Ltd., one of Israel's largest manufacturers of dairy products** and an early n-Join customer, is that it doesn't have to know the type of assembly line it's attached to, or what the sensors feeding it data are measuring. It's simply looking for correlations that indicate the manufacturing process is operating differently than usual. It then alerts its human supervisors, who can use their own experience and judgment to diagnose a specific problem.



Facial recognition technology for Holsteins and Jerseys ... being used on Maddox dairy in California to improve/modify feed rations.

Have you ever thought how emerging technologies will affect agriculture in the long run to optimize management and profitability? We have seen the implementation of robotic milking machines, brushes for added cow comfort, and automatic calf feeders on dairy farms across the country and world. But, imagine a data system that monitors your cows' activities 24 hours a day, 7 days a week from lameness and estrous detection to dry matter intake (DMI). With a new technology that recognizes each cow in the barn, this dairy farmer's dream becomes a reality.

During the California State Holstein Convention in January, Robin Johnston, co-owner of the cow facial recognition system, explained how his company's technology works. In addition, he described how the system is operating on Maddox Dairy.

Cainthus is the technology company that created the cow facial recognition system that monitors cattle via cameras located on the roof of the barn. The data is then sent to a server on the farm. The main goals are to utilize the data to maximize production and limit stress levels on the cows.

There are many uses for the artificial intelligence system that can be customized for the dairy farm's needs. For example, the system detected that the cows at Maddox Dairy are eating three to four hours a day. Steve Maddox commented on how he has already adjusted his herd's feed rations and dairy tour routes based on this information. In addition, limiting pen moves for cattle helps keep feed intake consistent across the herd. Maddox Dairy installed the system in the fall of 2016 and sees the system as a success.

Currently, the technology has only been developed for Holsteins, but Jerseys are next. The Holstein cows are differentiated from one another by the computer memorizing coat pattern and the markings on their face. Facial recognition for Jerseys in the future may use head shape or ear tag position.

This system is just one example of hundreds of new tools that dairy farms are using to adapt to this technological era and ultimately improve their operations.



Nutella algorith sold 7 million unique jars! Generated 10 million social media impressions.



Roughly 250,000 data points in 2016 to 4.1 million by 2034


Artificial intelligence



Everything



Milk by drone? The 21st century equivalent of the milk man?



What two colors are the yield sign?







Just as yield signs are yellow and black anymore ... either are taxis



Trend #10: Sharing Economy/Collaborative Economy









Coconut, soy and almond milk.



Animal free milk!



We must have humility when considering new technologies





Trend #10: Virtual Reality

Grandma watching Jurassic Park



The store of the near future?

Maybe not for everybody, but for some.





June 5, 2017

Now available in 600 Safeways in Northern California, Nevada and Hawaii

December 2016: Tyson invest in 5% stake in Beyond Meat



Counter Culture is making "Real vegan cheese" ... using yeast to produce a substance that is molecularly identical to milk.



Get a reverse mentor





Have you been paying attention?

Another little test ...



Take action



To future-proof your farm/dairy you must ... think!!!!!

FINISHED FILES ARE THE RE-SULT OF YEARS OF SCIENTIF-IC STUDY COMBINED WITH THE EXPERIENCE OF YEARS.

A little test for why Big Data will require humility.

FINISHED FILES ARE THE RE-SULT OF YEARS OF SCIENTIF-IC STUDY COMBINED WITH THE EXPERIENCE OF YEARS.

If you use the data to "see" new opportunities, TD Bank can benefit immensely.





Vaccination records, organic sustainability rating, feed & transportation records ... track everything from farm to fork And capable of executing smart contract



Think Twice ... you might be on "thin ice"



Think Twice ... you might be on "thin ice"



Krogers' fully automated dairy. Albertson's is also developing a facility.

## Kroger's best practices keep the milk fresh longer

A company executive said the new plant will help the company develop new products. She calls dairy an "under-innovated" category and adds, "We think there's a lot of future for dairy innovation."





Impact on budget deficits?





Arla is working on "solid milk" and "crunchy cheese."




Why the future will arrive sooner than you expect.

Here is a simple analogy that explains why.



If a lilly pad doubled every day for a month, on Day 20 how much of the lake would be covered?





20 doublings only cover .1% ... but what happens over the next ten days is amazing:

Day 20: 0.1 Day 21: 0.2 Day 22: 0.4 Day 23: 0.8 Day 24: 1.6% Day 25: 3.2% Day 26: 6.4% Day 27: 12.8% Day 28: 25% Day 29: 50% Day 30: 100%



Day 20: 0.1 Day 21: 0.2 Day 22: 0.4 Day 23: 0.8 Day 24: 1.6% Day 25: 3.2%



Day 26: 6.4% Day 27: 12.8% Day 28: 25% Day 29: 50%



Day 30: 100%



But you will future-proof your business. Here's the proof ... you (and other farmers) have been adopting new technologies since he beginning of farming.







IDFA