

Engineers computer and animal specialists applying science and technology to improve animal well-being and farm profitability

Applications for the Livestock Production Chain



Agriculture's Challenge to 2050:

Double food production on same or less land to feed and fuel 10 billion with less labor, adopt more efficient and sustainable production methods and adapt to climate change



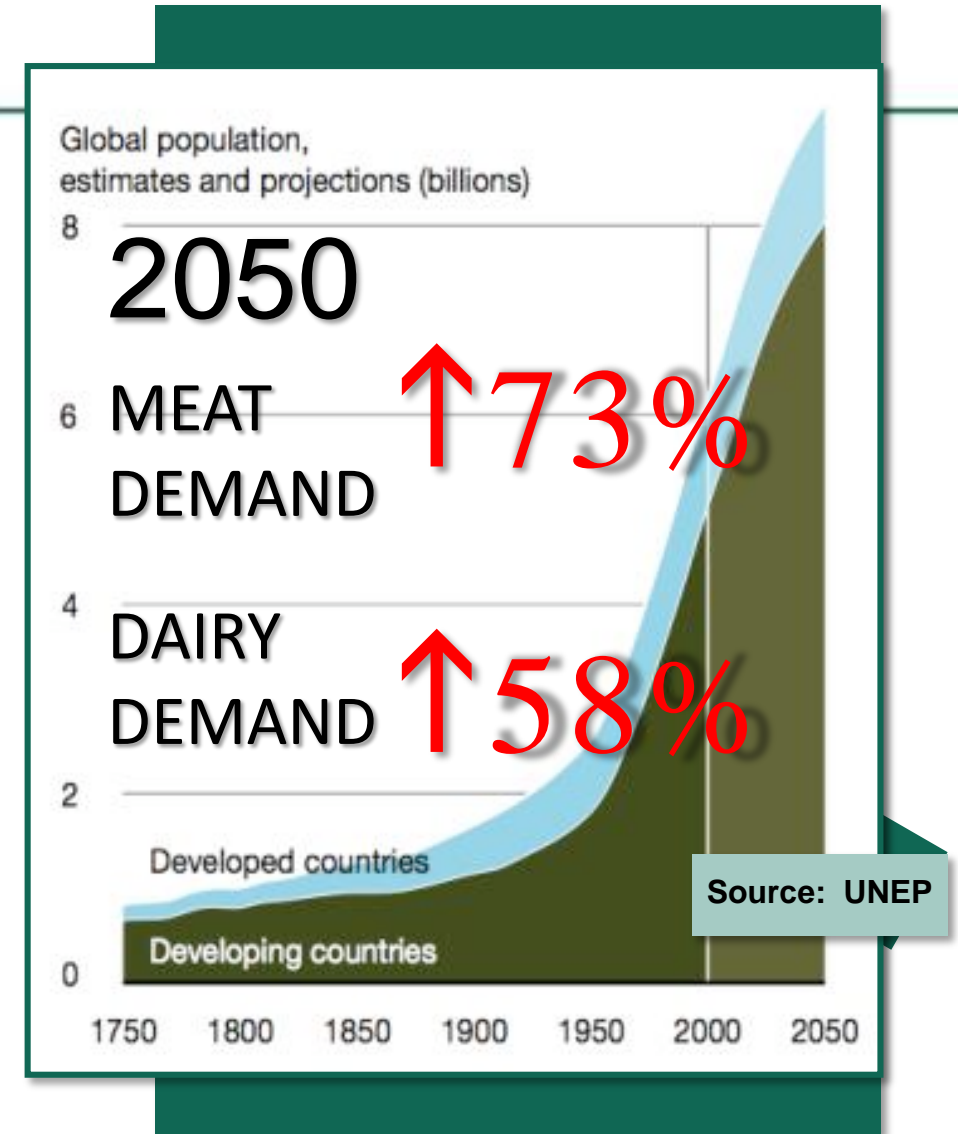
Livestock Industry

Under significant pressure:

- Volatile input prices
- Skilled labor shortage

Consumer perception

- Animal welfare
- Antibiotic use
- Environmental impact



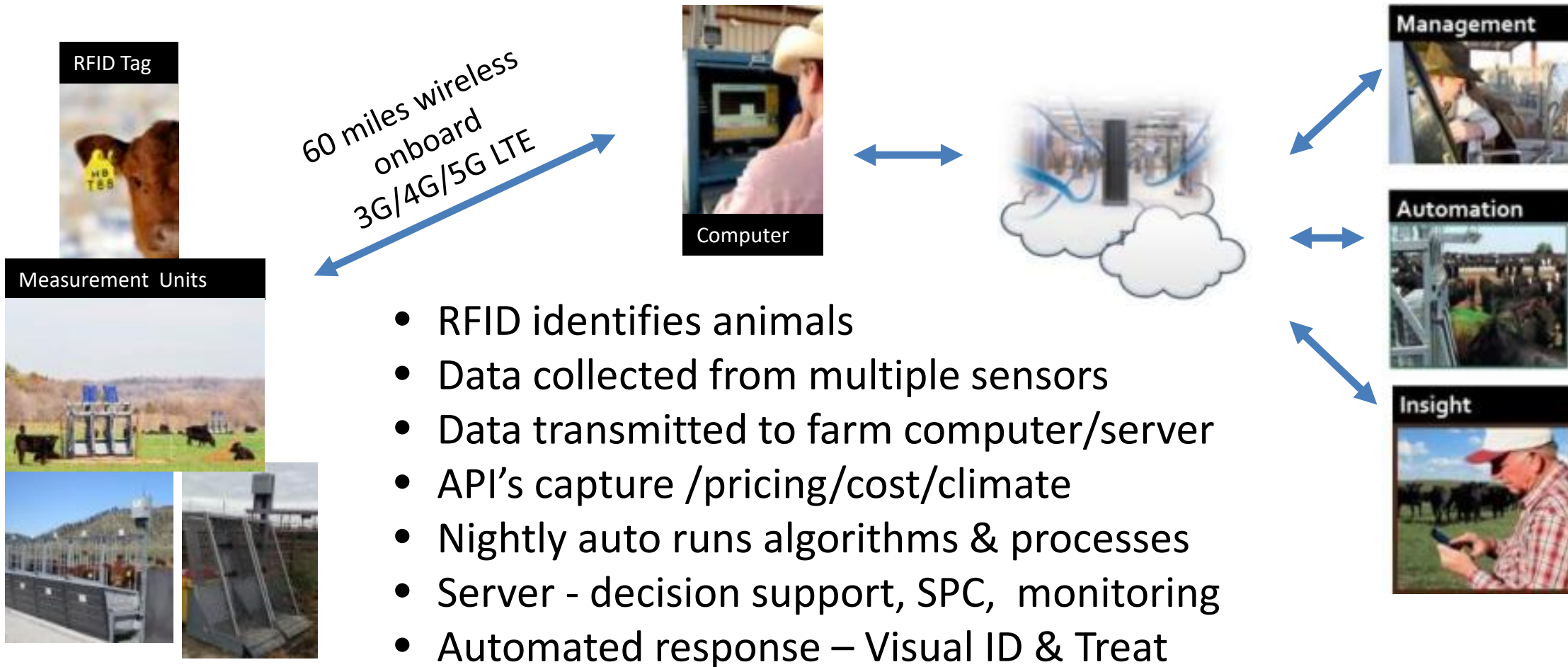
Do More with Less Sustainably – Disruptive Innovation

A photograph of a grassy field with several black cows. In the foreground, two cows are prominent. The cow on the left is facing the camera, wearing a red ear tag on its left ear and a yellow tag with the number '181' on its right ear. The cow on the right is facing away from the camera, wearing a red ear tag on its left ear and a yellow tag with the number '182' on its right ear. In the background, other cows are visible, and a piece of farm equipment is partially seen. The text 'Fertile Ground for IoT' is overlaid on the right side of the image.

Fertile Ground for IoT

GrowSafe® IoT Platform

Physical Sensing | Cognitive Computing | Predictive Analytics



1st App – Genetic Selection Feed Efficiency

Rancho da Matinha - Brazil



Residual Feed Intake (RFI)

Measured FI - Expected FI = RFI

Selection for RFI reduces¹

- Feed Intake - 12%
- Methane - 30%
- Manure NPK - 17%

¹ Agrifacts

Cattle Per Animal Savings:

Feedlot = \$60+ per 120d

Dairy = \$330+/cow/lactation



2nd App - Feedlot - GrowSafe Beef®

GrowSafe Beef®



Always Connected to GrowSafe

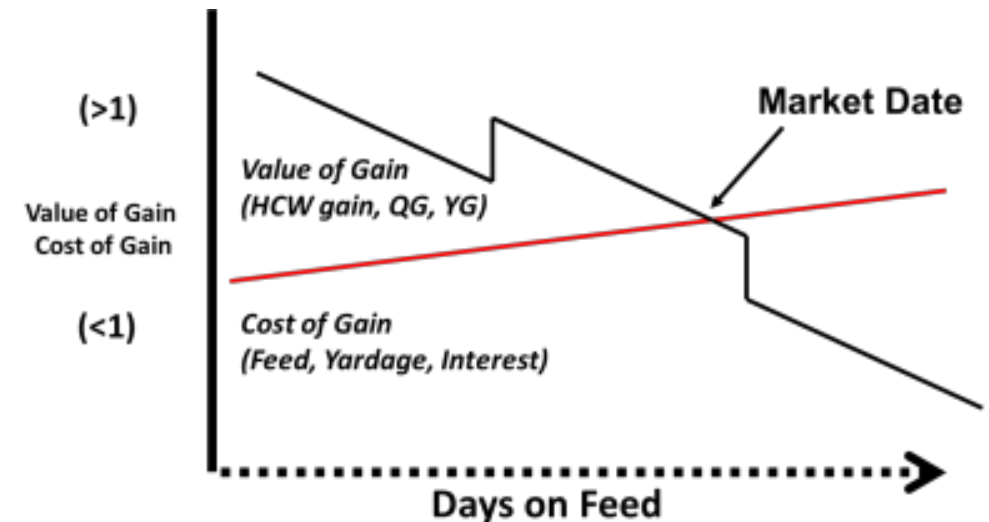
Data acquired when animal drinks:

- Non-invasive
- RFID and data from multiple environmental and biometric sensors
- Animal weighed
- Water intake and watering behavior measured

Cost:Benefit = \$1:\$6

Predictive 'Learning' Algorithms

- API's Integrate feed/treatment/harvest data
- Reports daily weight and growth statistics
- Accurately forecasts future feed intake and weight
- Digitally profiles animal health
 - ID sick 4d+ adv clinical symptoms
 - 24 hrs adv body temp change
- Determines optimum market time
 - When cost begins to exceed value



More Data – More We Learn

Targets Outliers

System Triggers:



Marking



Medicating

Up to 4 Water Soluble Products

3rd App Pasture Measurement

Integrating animal, plant, weather & soil data

Unprecedented ability in real-time to:

- Continuously and automatically track animals
- Identify disease before symptom expression
- Measure, predict future intake, gain and market value
- Treat individual animals without human intervention



2015 West Virginia University Pioneer Award 10 years of GrowSafe Feed Efficiency Testing



Innovation Commercialization Gap?

Despite a decade of innovation agendas:

- Slow to adopt/invest in new technology
- Rank in bottom 50% of peer countries
 - BERD laggard – last place
 - Patents – last place

Innovation Report Card		
1	Sweden	A
2	Denmark	A
3	Finland	A
4	US	B
5	Ontario	B
6	Switzerland	B
7	Netherlands	B
8	Quebec	B
9	Austria	B
10	B.C.	C
11	Norway	B
12	Canada	C
13	Germany	C
14	Japan	C
15	Alberta	C
16	Australia	C

Source: Conference Board of Canada

How to Ensure Sustainable Innovations Adopted?

1. Innovation must have positive ROI
2. Govt. ecosystem investments must be helpful not destabilizing

Budget #2017

“Government must ensure that its services best meet the needs of Canada’s innovators and job creators.”

Policy to ensure access to customers capital and talent

Our Pride:

Development of unique patented technology exported globally

Growing a profitable science based business HQ in Canada – 400+ PYE STEM employment

Leveraging research through collaboration – 65+ grad students, 2400+ publications

ROI to our shareholders



Overnight success after 26 years R & D



IOT

Imagine

everything

possible

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