The Future of Agriculture: Challenges, Threats, Barriers and Opportunities

A presentation to the Banff Pork Seminar, January 2018

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For decades, agriculture has kept up with increasing demand...

- By increasing land-use-efficiency
- By increasing feed conversion efficiency
- Because of this, the developed world enjoys a food supply that is...
  - Abundant
  - Diverse
  - Affordable
More production – not much more farmed land

Global Crop Area Changes 1960 to 2010

- Area "Saved": 1,635 million hectares
- Actual Expansion: 362 million hectares
- Area Needed w/o Yield Inc: 3,086 million hectares
- Actual Area 2005-10: 1,451 million hectares
- Actual Area 1960-65: 1,089 million hectares
Maize

Canadian Maize History

- Based on Yield
- Based on Area

Production in Tonnes

Early 60s, Late 60s, Early 70s, Late 70s, Early 80s, Late 80s, Early 90s, Late 90s, Early 00s, Late 00s, Early 10s
Barley

Canadian Barley History

- Based on Yield
- Based on Area

Production in Tonnes

- Early 60s
- Late 60s
- Early 70s
- Late 70s
- Early 80s
- Late 80s
- Early 90s
- Late 90s
- Early 00s
- Late 00s
- Early 10s
Soybean

Canadian Soybean History

- Based on Yield
- Based on Area

Production in Tonnes

- Early 60s
- Late 60s
- Early 70s
- Late 70s
- Early 80s
- Late 80s
- Early 90s
- Late 90s
- Early 00s
- Late 00s
- Early 10s
Canola

Canadian Canola History

- Based on Yield
- Based on Area

Production in Tonnes

0 2,000,000 4,000,000 6,000,000 8,000,000 10,000,000 12,000,000 14,000,000 16,000,000 18,000,000

Early 60s  Late 60s  Early 70s  Late 70s  Early 80s  Late 80s  Early 90s  Late 90s  Early 00s  Late 00s  Early 10s

Chart showing production of canola over different decades, with bars colored to indicate yield and area.
Improved Feed Conversion Efficiency

Feed conversion rates for hog operations have steadily risen, particularly for feeder-to-finish operations.

Pounds of feed per cwt of weight gain

Note: Farrow-to-finish operations are those on which pigs are farrowed (born on the farm) and then grown to a slaughter weight of 225-300 pounds. Feeder-to-finish operations are those on which feeder pigs (weighing 30 to 80 pounds) are obtained from outside the operation, either purchased or placed under contract, and then grown to a slaughter weight of 225-300 pounds.

North America plays a major role as a net exporter of food.
Food Dollar Trend in the US
But there are several basic challenges going forward

- Population growth and income growth driving more demand
- Climate change shifts and extremes
- Global movement of pests and diseases
- Loss of expertise via retirements and consolidation
- Labor limitations
Social License Challenges:
An Erosion of Trust

Declining Public Investment

Trust in the Industry and its Products

Trust in Regulatory Oversight
Declining Public R&D Support

Annual spending on research is adjusted for inflation by a research price index constructed by ERS. R&D = research and development.
The public doesn’t trust examples of science-driven, risk-based regulation.

Regulations haven’t protected us.

"I don't get no respect!"

Regulations are excessive and stifling.

Health Canada

CFIA

EPA

USDA
It doesn't help when there are poor examples of regulation.
Mistrust is actively cultivated by many entities
There has not been enough independently funded testing to prove that the sky is not falling!

Union of Concerned Chickens
Reasons Organic Is Problematic

- It represents many examples of good intentions, but...
  - Not science-based
  - Not justified by safety issues with conventional
  - Not conducive to many true best practices
  - Not an efficient use of key resources
  - Misunderstood by the public
  - Partially driven by highly irresponsible parties
This leads to widespread belief in a two-tiered food supply
This 2-tier perception is reinforced by downstream entities with a vested interest in “reaping profit by sowing doubt”

Along with major food companies, these high leverage, brand-sensitive players will block new technologies that could benefit farmers/producers.
Six Additional Threats/Barriers to Social License Defense
1. The Dark Ages 2.0

- Dark Ages 1.0
  - A major loss of human knowledge
  - Increased fear and superstition

- Dark Ages 2.0
  - Overwhelming information obscures knowledge
  - Increased fear and superstition
2. The Bizarre Modern Food Ethos

Food Demons
Cholesterol, Saturated fat,
Tropical oils, Red meat,
Sugar, HFCS, Gluten, Nitrates,
Hormones, Antibiotics...

The Marketing of Non-Existence

Food Magic
3. An Abundance of Disinformation
4. Parallel/Fake Science
5. Fake Transparency In Marketing

- Non-GMO Project Verified
- 100% Chemical Free!
- 100% Hormone Free
- Antibiotic Free
6. And what may be the biggest barrier to agriculture’s self defense? **Silos!**

But not that kind of silo
Or divisions within animal agriculture

Beef vs Dairy

Layers vs Broilers

Fished vs “wild caught” vs farmed vs terrestrially farmed...
Or divisions within crop agriculture

Row Crops

Specialty Crops

Vegetables
Small Fruit
Tree Fruit
Vines

Tree Nuts
Fiber Crops
Tropical Crops
Turf and Ornamentals
And this kind of silo

Natural Products

Synthetic Chemicals

Biotechnology
How do the silos inhibit agriculture’s self defense?

• An already small segment of society then further diminished

• We don’t know each other’s situations, issues...

• Less able to identify and cooperate on common goals

• All too often competitive with one another
How can the agricultural industry address these challenges?

- Sustainability
- Labeling?
- Truth Telling
- Humor
- Communication
- Humanization
Is Sustainability Labeling Going To Help?

Positive Aspects

• Focus on quantifiable “outcome-based” metrics
• Multi-stakeholder participation
• Striving for transparency
• Emphasis on progress over time
• Able to show that trends have already been positive
Which Sustainability Labeling?

Whose Sustainable Standard Wins? – Richard VanVranken, Growing Produce 9/7/17
Is Sustainability Labeling Going To Help?

Problems

• Leverage heavily weighted to downstream entities

• Not very producer-friendly. Producer incentives mainly obligatory

• Some key metrics not really quantifiable and some truths are inconvenient

• Unwillingness to compromise existing up-selling opportunities

• Probably not understood by consumers
“Something’s just not right—our air is clean, our water is pure, we all get plenty of exercise, everything we eat is organic and free-range, and yet nobody lives past thirty.”
FAIR TRADE
FOLLOW ME, AND I WILL MAKE YOU JUICERS OF KALE.

WHOLE FOODS
NON-GMO
ARTISANAL
FREE-RANGE
ORGANIC
GRASS-FED
HERITAGE
HEIRLOOM
NON-PROCESSED
VEGAN
GLUTEN-FREE
LOCALLY SOURCED
People love chickens that are "vegetarian fed"
The problem is that chickens are not vegetarians.
Old MacGimmick's Farm

www.oldmacgimmick.com
The Chicken Guarantees are a set of welfare standards that serve as a benchmark for the broiler chicken (chicken raised for meat) industry—and they’re also simple consumer guarantees. The Chicken Guarantees encompass chicken meat products of every kind found at grocery stores, restaurants and cafeterias in the U.S. to ensure people have the information they are seeking regarding how their chicken is cared for and raised.

Anytime you buy or eat chicken, you can be assured that the chicken is...

**Raised Cage-Free**
- The majority of birds chickens in the U.S. are raised in large, climate-controlled and ventilated barns, where they’re free to move about, interact with other chickens and have:
  - 24-hour access to fresh food and water.

**Free of Added Hormones and Steroids**
- It’s the law. The U.S. government has banned the use of hormones and steroids in poultry raised in the U.S.

**Monitored by Licensed Veterinarians**
- Licensed veterinarians, who have a professional obligation to protect the chicken’s health and welfare, provide comprehensive health care programs for every commercial chicken farm.

**Raised by Farmers Trained in Animal Welfare**
- Farmers receive training in handling and raising chickens in order to provide a safe, healthy and stress-free environment. If farmers or their employees mistreat chickens, they are subject to immediate disciplinary action, including termination and prosecution.
That surprised look when you show someone that broccoli didn’t occur “naturally” humans bred it from wild mustard.

Selection for terminal buds: Cabbage
Selection for lateral buds: Brussels sprouts
Selection for stem: Kohlrabi
Selection for leaves: Kale
Selection for stems and flowers: Broccoli
Selection for flower clusters: Cauliflower
Engaging consumers in the exposure of misleading marketing

READY TO PEEL BACK THE LABEL ON DECEPTIVE MARKETING?

Separating fact from fear mongering in food labeling

Consumers are encouraged to share examples of ‘fear mongering’ food labels on Twitter: “Take a photo and share it on Twitter using #PeelBackTheLabel.”
The Toto App?

A smart phone enabled way to check marketing claims – not voluntary
A voluntary label requiring 3rd party label assessment?

Certified B.S.-Free

ResponsibleLabels.org

Honest Label Project Approved
What about a producer-driven sustainability standard/certification

• One that springs from the grower/producer’s own desire to sustain their operation

• One including independent science input but also real-world understanding of the issues etc

• One that actually delivers what consumers think they get via organic but don’t

• One that reflects a unified agricultural sector voice that should garner more public trust than marketers who have been benefiting from scaring and/or misinforming consumers for a long time