LEGISLATION, CONSUMERISM, EXPORT REGULATIONS: Complicating the life of the nutritionist

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We are living in a time of increasingly rapid change

The time, in yr, it took to reach 50 million users

- Landline phone: 75
- Airline travel: 68
- The automobile: 62
- The lightbulb: 46
- Television: 22
- Youtube: 4
- Facebook: 3
- Twitter: 2
- “Angry Birds” app: 0.1
Some of the new technologies that are rapidly evolving today

- Autonomous vehicles
- Big data
- Crypto-currencies
- Artificial intelligence
- Babel-fish earbuds
- Zero-carbon natural gas
- Precision agriculture
Forces affecting food production, processing, wholesaling, trading and retailing

- Legislation and regulation
  - Food safety
  - Animal well-being
  - Environment
  - Antibiotic resistance
  - Trade
Forces affecting food production, processing, wholesaling, trading and retailing

- Legislation and regulation

- Special interest groups (NGOs)
  - Ethics of meat consumption
  - Ethics of animal agriculture
Forces affecting food production, processing, wholesaling, trading and retailing

- Legislation and regulation
- Special interest groups
- Marketplace (consumer) preferences
  - GMO free
  - Animal products free
  - Antibiotic free
  - Group house gestation
  - Organic, “natural”, “free range”, etc
At Oystercatchers, we are narrowing the gap between farm and table. We support the Suncoast Food Alliance, which provides local organic produce helping Florida farmers. We only serve sustainable, ocean friendly, premium quality seafood. Also, we are proud members of the Monterey Bay Aquarium.

Your dining experience and health are held at great priority. I wish to thank Gary’s Seafood for their excellent standard of quality. Enjoy your dining experience!

- Chef Shane Clark
Forces affecting food production, processing, wholesaling, trading and retailing

- Legislation and regulation
- Special interest groups
- Market (consumer) preferences
- Economics
Use of corn in the United States: 2017

- Feed: 5,375 (x 1,000 bushels)
- Ethanol: 4,282 (x 1,000 bushels)
- Exports: 1,925 (x 1,000 bushels)
- DDGS: 1,243 (x 1,000 bushels)
- High Fructose CS: 460 (x 1,000 bushels)
- Sweeteners: 380
- Starch: 235
- Cereal/other: 206
- Beverage/alcohol: 149
- Seed: 29

Source: Worldofcorn.com
Forces affecting food production, processing, wholesaling, trading and retailing

- Legislation and regulation
- Special interest groups
- Market (consumer) preferences
- Economics

- Technology
  - Nutrition, genetics, health, housing, behavior
  - Information and communications
  - Precision agriculture
Major trends affecting the pig industry

• Global population growth
  – Population today is 7.6 billion; in 1800, it was 1 billion
  – More food will be required in the next 100 years than was consumed over the past 7000 years
  – For every child born in the developed world, there will be 20 children born in the developing world
  – Over 6,000 children die every day due to malnourishment
Perhaps the biggest challenges of our time?

- Information explosion
- Accuracy information
- Greater need for analytical skills
- Cautious decision-making
- Declining confidence in science
The society which scorns excellence in plumbing as a humble activity and tolerates shoddiness in philosophy because it is an exalted activity will have neither good plumbing nor good philosophy: neither its pipes nor its theories will hold water.

- John W. Gardner
# Information explosion: Time to double new knowledge

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Duration</th>
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<tbody>
<tr>
<td>1750 to 1900</td>
<td>150 yr</td>
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<tr>
<td>1900 to 1950</td>
<td>50 yr</td>
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<tr>
<td>1950 to 1960</td>
<td>10 yr</td>
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<td>1960 to 1992</td>
<td>5 yr</td>
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<tr>
<td>2020</td>
<td>73 days</td>
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Source: 1992 Conference on Teach America
The sad reality is we can spend 100% of our time in front of the computer gathering new information and we would still fall well short of knowing all there is to know.
How might we respond to this explosion of new knowledge

Knowledge Pyramid

- Don’t need to know
- Must know to lead
- Must know to be successful
- Must know to survive

Knowledge Pyramid
How might we respond to this explosion of new knowledge - #1?

Knowledge Pyramid

- Don’t need to know
- Must know to lead
- Must know to be successful
- Must know to survive

IOWA STATE UNIVERSITY
APPLIED SWINE NUTRITION
How might we respond to this explosion of new knowledge - #2?

- Focus on **topics** of most importance
- Specialize
- If you are not going to apply the new information, do not acquire it
  - Consider the opportunity cost of spending time on acquiring knowledge you do not need

- Focus on **sources** deemed most valuable, dependable and complete

- Use **professionals** with valuable and relevant expertise
Increasing need for analytical skills

- Question everything you hear and read
- Demand proof
- Question your own biases
- Great opportunity to provide training in logic and reasoning; we are not born with these skills, but we can learn them and develop them
- Have confidence in your own abilities to understand, to learn and to sort through new information
Increasing need for analytical skills

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Incorrect information is worse than no information at all
“Confirmation bias”

The tendency to favour information that confirms our pre-existing beliefs or biases

It impacts how we collect new information, and how we interpret new information

It can prevent us from looking at situations objectively

It can influence the decisions we make and can lead to poor or faulty choices
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Cautious decision-making

1. How many good quality scientific studies do you have access to upon which to make a decision
   ✓ Never underestimate the value of repeatability

2. P-value
   ✓ What does the P-value mean
   ✓ What P-value do I need to make a sound decision

3. Economics
   ✓ Risk versus reward
The enzyme blend improved growth rate

<table>
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<tr>
<th>Trt</th>
<th>X</th>
<th>EB</th>
<th>X*EB</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.251</td>
<td>0.024</td>
<td>0.910</td>
</tr>
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</table>

Average ADG, kg

- X-: 0.470
- X+: 0.478
- EB-: 0.466
- EB+: 0.482
The enzyme blend improved small intestinal barrier integrity

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![Graph showing the enzyme blend's impact on lactulose: mannitol ratios](chart.png)

- X-: 0.57
- X+: 0.61
- EB-: 0.68
- EB+: 0.51
The enzyme blend improved small intestinal barrier integrity.
Current role of the nutritionist

- Defining nutrient requirements
- Evaluating ingredients
  - Current ingredients
  - Potential new ingredients
- Quality assurance
  - Nutrient composition, including variability
  - Processing consistency
  - Absence of toxins
- Meeting legal requirements
- Achieving carcass and pork quality targets
- Achieving environmental expectations
Evolving/new roles of the nutritionist

- More ingredients and more complex ingredients
- Full traceability
Evolving/new roles of the nutritionist

- Functional properties of ingredients
- Feed additives with narrower functional roles
Effects of antibiotics and additives on overall ADG

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<th></th>
<th>CON</th>
<th>SDPP</th>
<th>DEP</th>
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<tbody>
<tr>
<td>AB-</td>
<td>0.237</td>
<td>0.254</td>
<td>0.257</td>
</tr>
<tr>
<td>AB+</td>
<td>0.258</td>
<td>0.268</td>
<td>0.251</td>
</tr>
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1Means within a row without a common superscript differ significantly (P < 0.05).

Source: Ruckman, 2018
Evolving/new roles of the nutritionist

- Ingredient supply chain management
- Feed mill biosecurity plans: facilities and operations
Evolving/new roles of the nutritionist

- Meeting animal welfare requirements
- Greatly expanding regulatory requirements
  - Feed plants versus food plants
Evolving/new roles of the nutritionist

- Supplying nutrients via the water
- Development/implementation of growth models

Energy Metabolism

- Proteins
  - Amino acids
  - Glycolysis
  - Pyruvate
  - Acetyl CoA
  - Citric acid cycle
- Carbohydrates
  - Simple Sugars
  - ATP
- Fats
  - Fatty acids
  - Oxidative phosphorylation
  - ATP
Evolving/new roles of the nutritionist

- Precision agriculture
Questions or Comments?
The most important keys to success in feeding pigs in the future?

- Pig management
- People management
- Financial management