Communicating a New Vision for the Science of Food

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Retired Food Executive
Past President, IFT
Challenges facing our food system today are numerous, and include:

- Global food availability
- Health and wellness
- Climate change
- Limited land area
- Limited natural resources
- Bio-energy
- Global supply chain
- Food safety
- And many others
Can Food Technology Feed 9 Billion People in 2050?

- Agricultural improvements alone will not be enough to provide future generations with safe and nutritious food.
- Food technology can aid in making better food available.
Findings from an IFT White Paper: Feeding the World Today and Tomorrow

- The food system must:
  - Be science and technology based
  - Be flexible and resilient
  - Be consumer driven
  - Assure the health and wellness of consumers
  - Protect the environment and natural resources
  - Be sustainable

- Society must invest in:
  - Basic and applied research
  - Education and outreach

- Food scientists must work together with many others:
  - Academia, industry, government, and the public
  - Science, engineering, agriculture, marketing, medicine and others
Global Food Insecurity

- By 2050 food production must increase by 70% to feed a population of 9 billion
- ‘Westernisation of diets’
  - 8kg grain to make 1 kg meat
- Climate change
  - Every +1°C increase reduces yield by 10%
Global Perspective and Challenges

Future:

• Continuing population growth of 40% by 2050 to 9.5bn

• Increased urbanisation – 60% population in cities by 2030

• Increased prosperity in developing world

• Increased demand of agricultural commodities for livestock
Global Perspective and Challenges

- International trade, impact on Food Safety
- 1bn people suffer hunger or under nutrition
- 2bn people malnourished
- 2bn people obese or overweight
The Global Challenge of Food Waste

Approximate amount of global food loss and waste

33% - 50%

of food produced for human consumption,
or 1.3 BILLION METRIC TONS PER YEAR.
Water Scarcity

- 96% of water is salt water...68% of fresh water is glacier or polar ice
- Leaves < 0.01% available for consumption
- Irrigation consumes 70% of world’s fresh water used
- 1 Kg of beef consumes 22,000 litres of water
- 175m Indians consume grain produced from water supplies that will soon run dry
- 2/3 of people could be water stressed by 2025
- 261 river basins are shared by more than one country
The Impact of Digital Advances

• Rapid dissemination of information and feedback

• Global perspectives generate local innovations

• Fewer barriers to entry into markets

• Small rural areas can now participate in globalization

• Trace back systems have improved
  ▪ IFT recommendations for the FDA
The Empowered Global Consumer

- Social responsibility
- Organic/natural
- Fear of technologies
- “Processed foods”
Processed Foods: An Important Nutritional Role

- The processing level was a minor determinant of individual foods nutrient contribution to the diet and, therefore, should not be a primary factor when selecting a balanced diet.
Would you eat this?

AN ALL-NATURAL BANANA

INGREDIENTS: WATER (75%), SUGARS (12%) (GLUCOSE (48%), FRUCTOSE (40%), Sucrose (2%), MALTOSE (<1%), STARCH (5%), FIBRE E460 (3%), AMINO ACIDS (<1%) (GLUTAMIC ACID (19%), ASPARTIC ACID (16%), HISTIDINE (11%), LEUCINE (7%), LYSINE (5%), PHENYLALANINE (4%), ARGinine (4%), VALINE (4%), ALANINE (4%), SERINE (4%), GLYCINE (3%), THREONINE (3%), ISOLEUCINE (3%), PROLINE (3%), TRYPTOPHAN (1%), CYSTINE (1%), TYROSINE (1%), METHIONINE (1%), FATTY ACIDS (1%) (PALMITIC ACID (30%), OMEGA-6 FATTY ACID: LINOLEIC ACID (14%), OMEGA-3 FATTY ACID: LINOLENIC ACID (8%), OLEIC ACID (7%), PALMITOLEIC ACID (3%), STEARIC ACID (2%), LAURIC ACID (1%), MYRISTIC ACID (1%), CAPRIC ACID (<1%), ASH (<1%), PHYTOSTEROLS, E515, OXALIC ACID, E300, E306 (TOCOPHEROL), PHYLLOQUINOINE, THIAMIN, COLOURS (YELLOW-ORANGE E101 (RIBOFLAVIN), YELLOW-BROWN E160a), FLAVOURS (3-METHYL-1-YL ETHANOATE, 2-METHYLBUTYL ETHANOATE, 2-METHYLPROPAN-1-OL, 3-METHYLBUTYL-1-OL, 2-HYDROXY-3-METHYLETHYL BUTANOATE, 3-METHYL BUTANAL, ETHYL HEXANOATE, ETHYL BUTANOATE, PENTYL ACETATE), 1510, NATURAL RIPENING AGENT (ETHENE GAS).
Food in the Future

Today’s global issues will remain
- Food Security
- Water & Other Natural Resources
- Health and Wellness
- Global Food Supply Chain
  - Intricacies
  - Regulatory Harmonization
- Food Safety
- Sustainability of Food Systems
Global Perspective and Challenges

The Perfect Storm scenario

It is predicted that by 2030 the world will need to produce around 50 per cent more food and energy, together with 30 per cent more fresh water, whilst mitigating and adapting to climate change.
It’s **not** just about producing more...

...but about **reducing pre- and post-harvest losses**

...and **reducing wastage**.
Essential Role of Science and Technology

...but not everyone understands the role that science and technology played and must play in the future.

[Diagram showing the interconnection of Science and Technology with Availability, Accessibility, Nutritious Food, Safe Food, Diversity of Foods, and Affordability.]
Food News is Hot!
The Scientific Facts: Study did not look at vending machines or obesity

Source: D. Allison, University of Alabama-Birmingham, ObesityandEnergetics.org
Diet Soda Leaves Your Gut Unsatisfied, Contributes To Obesity

Many people drink diet soda to lose weight or to avoid gaining weight. However, drinking diet soda can make you fat, leading to obesity and its associated problems, say a new study published in the June 2012 issue of FEMS Microbiology Ecology.

**Humans, diet soda and obesity were not even studied**
Vinculan por primera vez la diabetes con el consumo de bebidas light

Dicen que tomar 1,5 litro por semana duplica el riesgo de contraer la enfermedad.

Investigadores franceses publicaron en la edición de febrero de la revista American Journal of Clinical Nutrition los resultados de un estudio epidemiológico que asocia, por primera vez, el consumo regular de bebidas light al riesgo —superior al doble— de contraer diabetes Tipo 2 —la llamada diabetes azucarada—.

El resultado es sumamente relevante ya que contradice lo que uno creería naturalmente: el riesgo es más grave para los grandes consumidores de bebidas con edulcorantes que para aquellos que toman bebidas con azúcar.

Los autores de la investigación trabajaron con un grupo de 88.118 mujeres, a las que siguieron de cerca durante catorce años. Sólo tuvieron en cuenta los casos de diabetes aparecidos durante el seguimiento —entre 1993 y 2007—.
Scientific Facts: A study of mice, involving substance found in coffee

- No significant weight gain
- Nobody died

Source: D. Allison, University of Alabama-Birmingham, ObesityandEnergetics.org
Emotion Raising Language

• Sugary beverages represent a threat to global health. Trends Endocrinol Metab 2012;23(12):591-593.


• The perils of ignoring history: Big Tobacco played dirty and millions died. How similar is Big Food? Milbank Q 2009;87(1):259-294.
**PREAMBLE: Some Authors Have Declared War on Obesity.**


“The First Casualty of War is Truth”

~ Aeschylus
Why Most Published Research Findings Are False....John Ioannidis

Findings less likely to be true when:

- The smaller the studies
- The smaller the effect sizes
- The greater the number and the lesser the selection of tested relationships
- The greater the flexibility in designs, definitions, outcomes, and analytical modes
- The greater the financial and other interests and prejudices in a scientific field
- The hotter a scientific field (with more scientific teams involved)

Published online Aug 30, 2005.
Use of Causal Language in Observational Studies of Obesity and Nutrition

Stacey S. Cofield
Rachel V. Corona
David B. Allison

Percent of articles using unjustified causal language.
Effective Preparation of Scientific Manuscripts

Daryl Lund
Editor in Chief IFT Peer-Reviewed Journals

And

David Min
The Ohio State University
Scientific Editor JFS Food Chemistry and Toxicology and Chemical Food Safety Sections
A biology professor trained a flea for many months.

He was able to get a response from the flea each time when the command was given. The professor shouted the command “Jump” and the flea leaped into the air.

The professor decided to determine the location of hearing receptor.
Professor removed the legs of the flea one at a time. The flea continued to leap on his command “Jump”. But as each successive leg was removed, his jump became less spectacular.

Finally, with the removal of the last leg of flea, the flea did not response to the command “Jump” and the flea remained motionless.
Conclusion

• “When the legs of a flea are removed, the flea can no longer hear. Therefore, the locations of hearing receptors are in legs.”
Expertise ➔ Certainty

Primary Source ➔ Interactional ➔ Core Contributors ➔ Popular Understanding ➔ Beer mat knowledge

Courtesy Prof. Harry Collins “are we all scientists now?”
How do we tell the story of science?
The day in the life of a food scientist will change…
The Rapidly Evolving Role of the Food Scientist

- Biology
- Engineering
- Microbiology
- Toxicology
- Consumer Science
- Sensory
- Chemistry
- Nutrition
- Genomics
- Food Law
- Biotechnology
- Computer Science
- Quality Assurance
- Packaging
- Animal Science
- Materials Science
- Psychology
- Product Development
- Flavor Chemistry
- Food Law
- Quality Assurance
The Food Scientist Leadership Challenge

The Collaborator

The Advocate

The Visionary
IFT’s Vision & Mission

We envisage a world where science and innovation are universally accepted as essential to a safe, nutritious, and sustainable food supply for everyone.

IFT is dedicated to advancing the science of food and its application across the global food system.
Our Purpose

Our Vision
A world where science and innovation are universally accepted as essential to a safe, nutritious, and sustainable food supply for everyone.

Our Mission
To advance the science of food and its application across the global food system.

Our Promises
As a global organization, we are committed to our community of members, volunteers, and partners. That commitment is reflected in the strategic priorities that guide us, with the objective of increasing member value, driving organizational accountability and, ultimately, helping us to achieve our mission and vision.

Develop: Advance and Promote Careers in the Science of Food
Enhance and promote the knowledge of IFT members and prospective members worldwide.

Network: Establish Productive and Interactive Global Networks
Engage and convene relevant stakeholders to debate, create and transfer knowledge, and communicate the latest information affecting the science of food.

Innovate: Promote Science, Technology and Their Application
Be a source of influence and thought leadership for the development, application and communication of the science of food.

Advocate: Address Issues and Influence Outcomes
Be the objective voice of the science of food by leveraging IFT's members to proactively contribute evidence-based science to the public dialogue on food issues.

IFT has always been my foundation for food science and continuing professional friendships.

MARTHA RHOADES ROBERTS, PhD
Special Assistant to Dean for Research
IFTAS

More About IFT

Develop:
Advance and Promote Careers in the Science of Food

Enhance and promote the knowledge of IFT members and prospective members worldwide.

Certified Food Scientist®
Feeding Tomorrow®
IFT Student Association
Leadership Opportunities
Network:
Establish Productive and Interactive Global Networks

Engage and convene relevant stakeholders to debate, create, transfer knowledge, and communicate the latest information affecting the science of food.
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Be a source of influence and thought leadership for the development, application and communication of the science of food.
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Be the objective voice of the science of food by leveraging IFT’s members to proactively contribute evidence-based science to the public dialogue on food issues.
“We need to find a different way to tell our story.”

--IFT15 CEO Panel
How IFT has been telling our story about an optimistic future based on science...

Food Science is Required to Feed this World’s Future Populations
The Science of Food as the Solution

- Two celebrations triggered a new idea…
  - How do we feed 9 billion people by 2050?
  - How do we tell our story based on science?

- FutureFood 2050 Program
  - 75 interviews: Establish a long-term link between both anniversaries
  - Create a steady stream of promotions
  - Work with documentary director
75 interviews

Publish 4-5 per month from 2014 – 2015

Translate the core themes to the film and produce a documentary on how we will feed the world sustainably.
Visit the website at www.FutureFood2050.com
Documentary Update
The Documentary: Scott Hamilton Kennedy
What You Can Do…

- Help spread the word about how food science helps to ensure a safe, healthy and plentiful global food supply at www.FutureFood2050.com

- Consider republishing opportunities or sharing of stories via social media
We face a growing challenge to feed nearly 7 billion people today...

The expected population growth to 9 to 10 billion people by 2050...

...food science and technology will have to provide critical solutions.
Our Vision

A world where science and innovation are universally accepted as essential to a safe, nutritious, and sustainable food supply for everyone