



3 Top Solutions to a Food-Secure Tomorrow

There are many pathways that can have an impact on achieving a food secure world; however, research, experts, history and practical global execution point to three solutions that stand out as the most significant, can have the most impact and can be acted upon the quickest.

- 1. Innovation.** The products, practices and genetics that help farmers produce more food more sustainably – innovations that, in many cases, are already available, safe, regulated and proven. Experts from scientists to economists say it's the biggest part of the solution – 70%.¹ We must enable innovation more than any other time in our history.
- 2. Choice.** Farmers need to be able to choose the right practices for their operations. Consumers need to be able to choose food that fits their price, taste and nutritional needs. And we need regulators and policy makers to make science-based policy choices. Choice must not be taken away without a fact-based, legitimate reason from science-based regulators.
- 3. Trade.** The mechanism that allows us to produce food where it's more economical and sustainable and deliver it to people who need it. Pure economics and the environment prove that food must move from the most to the least productive areas for a food secure tomorrow. Politics need to be reduced while trade needs to increase in parallel with local advances in food production.

Given the urgency, prioritizing our solutions has never been more critical.

Solution #1: Innovation



The Power of Innovation: A Glass Half Full

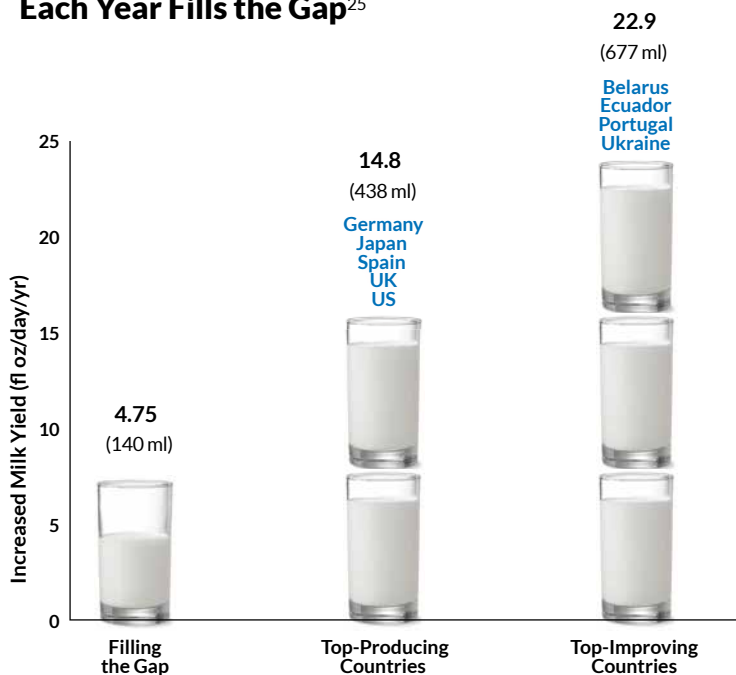
Innovation is at the center of the most challenging issues of our time. While there is resistance to innovation in food, we need to better understand the realities. Examples, like the milk story below, are often the best way to bring these to life.

With a predicted milk shortage, the Food Forward researchers evaluated opportunities to fill the gap.

On our current path – the same productivity and cow herd growth rates – we would have almost 40 million more dairy cows in 2050. That's significantly more feed and water. But that still wouldn't fill the gap. And given we're already exceeding our planet's resources, adding more cows simply isn't sustainable.

Today, globally one cow produces an average of 2 gallons each day. In leading areas, it's more than 7 gallons a day. Organic milk production yields on average at least 25% less than local conventional production.²⁹ Researchers predict we can fill the gap and freeze the footprint of milk production if every year, every cow increases her daily production just 4.75 oz. Many countries around the globe are already increasing at rates 3-4 times this through their use of innovation.²⁵

A Modest 4.75 oz. Daily Production Increase Each Year Fills the Gap²⁵

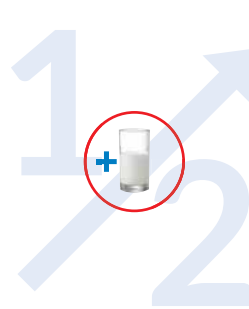


“Sustainable global food security is attainable if we have open minds on technology and focus on high productivity and efficiency. We cannot feed tomorrow’s world with yesterday’s technology.”

– Aalt Dijkhuizen, Wageningen University & Research Centre, The Netherlands

More Innovation, Not More Animals

1 Cow → **32 Glasses of Milk** currently produced each day + **Half a glass more²⁵** = **Enough Milk to meet future demand**

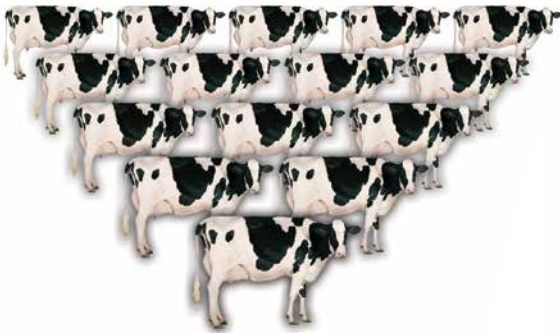


Simply by using practices available today or already in the pipeline, cows around the world can increase their output by a mere half glass per cow – enough to satisfy future global demand. Examples of such practices include:

- Fresh, clean water
- Feed optimization
- Vaccines
- Disease control
- Improved housing & comfort
- 3x a day milking
- Long-day lighting

Applying Today’s Technology to Add Half a Glass More, Dairy Producers Could Annually Save:²⁵

66 Million Cows*



*Cows and buffalo

747 Million Tons of feed and
388 Million Acres of farmland –
the size of Alaska



618 Billion Gallons of water –
the annual domestic use
of Germany, France
and the UK combined



Many farmers can’t take advantage of current innovations, practices or products. Solutions exist; access doesn’t.

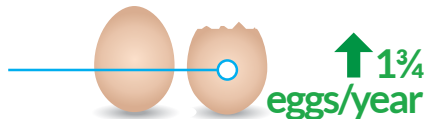
The Egg Production Reality²⁵

THE 2013 FOOD FORWARD ANALYSIS also examined the global egg industry, finding a startling example of what happens when innovation is prohibited. More than a decade of disease, social pressures and increasing regulations on safe, proven practices have dropped global hen productivity nearly an egg/hen/year after decades of increases.

On the current path, we'll need 12.6 billion birds – nearly double today's 6.5 billion – plus the massive resources to support them to meet demand in 2050.

6.5 billion hens produce
184 eggs each annually

For decades,
production
increased



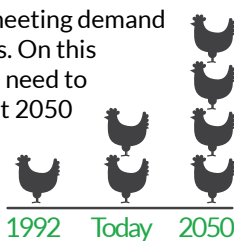
Since the
late 1990s

the productivity trend
has reversed due to
disease, changing practices,
removing innovation.



The Production Opportunity

Today, we're meeting demand by adding hens. On this path, hens will need to double to meet 2050 demand.



Instead we can bring back innovation and help hens produce more.



Just ONE more egg per hen per year helps meet demand and requires 4 billion fewer hens.

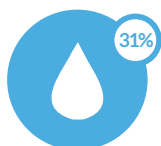
Using innovation, not adding hens, would save:



113 million
tons of feed



65 million
acres of land



74 billion
gallons of water

Source: Cady, R. Elanco Animal Health. Food Forward Analysis. 2013. Data on File. Validated by International Egg Commission.

Accepting Innovation

Throughout history, the world's biggest problems have been solved through innovation. It's celebrated in virtually every sector of the economy. So why is innovation questioned when it's linked to food? In the past 60 years, a wide range of innovations in agriculture have allowed farmers to produce more while better caring for the animals and decreasing environmental impact. In fact, in the United States, agriculture outputs have grown 250% on the same level of inputs.³⁰

Then



Today



7 U.S. cattle yield the beef of 10 cattle in 1977³¹



U.S. cows yield 4 times the milk of cows in the mid 1940s³²



U.S. farmers produce the same amount of pork with 38% fewer pigs than farmers in 1959³³

Meanwhile, organics and "luxury food" produced without innovation have almost become a status symbol for those who can afford it. Increasingly, research points to a lack of any significant scientific evidence suggesting improved nutrition, safety or resource use from organic foods.

A recent study by Stanford University's Center for Health Policy evaluated 237 reports and found little difference in health benefits between organic and conventional foods.³⁴ Further, in a meta-analysis of 66 studies, researchers from McGill University in Canada and the University of Minnesota found that organic methods produce 25% less food than conventional farming on the same land area.³⁵

Innovations that have improved food production

- Animal health and sanitation
- Disease detection
- Animal nutrition
- Animal comfort
- Artificial insemination and genetic improvements
- Vaccines
- Parasite control
- Animal housing
- Productivity optimizations

We support the personal choice of organic foods, but one person's choice shouldn't be imposed on others. Further, consumers need to consciously understand these choices. Ultimately, science simply doesn't support most claims being made today about organic food production. It's time we begin to consider the full consequences of these choices.

Learning from Global Experts

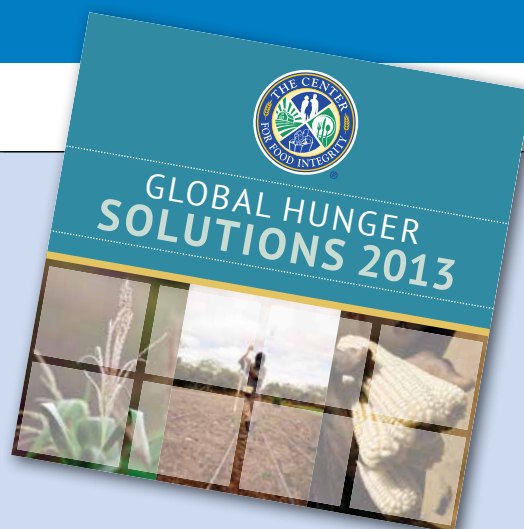
by Charlie Arnot, CEO,
The Center for Food Integrity

In an effort to foster more productive dialogue, The Center for Food Integrity conducted the **GLOBAL HUNGER SOLUTIONS SURVEY** of leading global experts on food security to get their take on workable solutions.³⁶ We asked 16 experts with extensive experience and a global perspective. These individuals have dedicated their distinguished academic, journalistic and professional careers to addressing these pressing issues.

The experts said public policy, technology and education of smallholder farmers leads to individual self-sufficiency critical to solving the food security crisis. And finding a solution is about more than feeding hungry mouths, it's about building geopolitical stability. As Roger Thurow, author, journalist and senior fellow at the Chicago Council on Global Affairs said, "Hunger is both the cause and effect of conflict."

We are conflicted as a society in our support of innovation and technology that allows farmers to grow more food using fewer resources. All consumers have a right to expect safe food produced responsibly. But we need to tread carefully in defining responsible production. A cultural bias that drives scientifically supported innovation from the market could have devastating consequences in the developing world, or even on lower income families in industrialized nations. We should neither embrace nor reject technology and innovation out of hand, but invest the time and energy to better understand the impact of either using or eliminating technology on people, animals and the planet. The consequences of a rush to judgment are too great.

Long-term solutions will require governments to encourage the support of smallholder farmers, bringing them up to date on modern farming methods, while championing the adoption of responsible agricultural technologies. Achieving that level of support will require unprecedented public engagement. Each of us can plant a seed by encouraging that engagement and supporting thoughtful analysis and policy that will bring an end to food insecurity.



Experts' Solutions

Critically Important

