ENOUGH: Global food production under threat, innovation needed

The world population is projected to reach 9.7 billion by 2050. Adding nearly three billion more people to the global population in the next three decades presents a serious challenge: how can we produce more and enough food to feed the world's population without using more resources?

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On the current food production trajectory, we will lose the battle for a food-secure world. If declining production trends continue as a result of continued disease challenges, changing production practices and the removing of innovation from some parts of the world, our farmers won't be able to meet the increasing global demand for more animal protein such as milk, meat and eggs. Nearly half the globe of 4.5 billion people won't meet their nutritional needs by 2040 if we don't use innovation in food production.

These sobering and alarming facts about our current and future food security status, among many others, are laid bare in a food security report released by the ENOUGH movement which is committed to building a food-secure world by 2050. The ENOUGH movement is spearheaded by Elanco Animal Health, a global innovation-driven company that develops and markets products to improve animal health and food animal production in more than 75 countries.

According to ENOUGH, there are four realities that are shaping the world's food supply:

• Population: today, there are 7 billion of us on the earth. When the ENOUGH report was first written, it was estimated that there would be 9 billion people on Earth in 2050. Recently, that original estimate for 2050 has risen 100,000,000 and is expected to surpass 9.5 billion by 2050. On this trajectory, the world's population could hit more than 12 billion by 2100.

• Resource use: two years ago scientific models showed we were using 1.5 times the earth's resources per year, which was unsustainable. That number has gotten even more concerning as the estimates now show humans using the equivalent of 1.6 times the earth's resources per year.

• Health: threats to animal health from diseases are increasing.

• Perspective: Organic agriculture represents only 4 percent of the US market and 5.4 percent of the European Union's. In South Africa, only 0.04% of total land is under certified organic management (Sustainability Institute study commissioned by the Southern Africa Food Lab, May 2015). Organic agriculture simply isn't in the position to feed the number of neighbours we'll have in 2050. We must keep actively pursuing other options to make sure the world is fed.

"With the rapidly expanding middle-class, there will be a 60% increase in demand for meat, eggs and milk. This means that we have to find a way to increase supply to meet demand and provide it sustainably," explains Andre Westerveld, regional director of Elanco South Africa.

The milk story – how innovation can create a food-secure world

Milk is just one practical example of food production that is already under constraint. Right now, per capita milk production around the world already cannot meet basic nutritional needs, and the gap could grow. According to the Enough report, the global recommended milk intake is two 240 ml glasses of milk per day, and on average around the world, we have access to about one. Today, one cow produces an average of 7.5 litres of milk per day. But in leading areas, it's more than 26 litres per day. Researchers predict that we can have enough milk and freeze our environmental footprint if, every year, every cow increases her daily production by just 140 millilitres, approximately half a glass. Many countries around the globe are already increasing at rates of three to four times this through the use of innovation and improved cow husbandry.

The ENOUGH movement assembled a team of researchers to study this issue. Informa Economics and Global AgriTrends validated the model. The findings of the 2013 Global Food Forward Analysis show that by applying today's technology to add just half a glass more per cow, dairy producers could annually save:

• Adding 66 million cows – think of the massive environmental impact.
• 747 million tonnes of feed - approximately enough to fill 6,058 Empire State buildings.
• 1,570,180 square km of farmland – roughly the size of Alaska.
• Almost 2.4 trillion litres of water — the annual domestic use of Germany, France and the UK combined.

"Adding more animals to meet demand is simply not sustainable, economical or environmentally friendly. But by ensuring that the current number of cows have sufficient fresh water, comfortable housing, improved feed optimisation, better disease prevention and control, and milking three times per day, we can meet the production requirements without having to add more animals and increase the impact on the environment," says Andre.

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An innovation example: combining grass-grazing with automated milking

Now that milk production quotas have been removed in the European Union (EU), many European dairy farmers are looking to expand production and are increasingly turning to automated milking systems. However, the increase in the use of AM is associated with a decrease in grazing and there is a major concern that the established economic benefits of grazing will be lost or substantially reduced if the use of AM systems is not integrated with the grazing of dairy cows.

This is the subject of the Autograssmilk project. The objective of the project is to develop and implement improved sustainable farming systems that integrate the grazing of dairy cows with AM, which is appropriate to the different approaches to dairy farming to be found in the different regions in Europe. Can grass-grazing and automatic milking be combined for an affordable price? That is what the Autograssmilk project is trying to work out, developing and testing a variety of cow movement systems. One device electronically identifies where grass density is highest and a gate selectively allows tagged cows into the milking areas or new paddocks - better foraging makes for better milk.

A second project is testing virtual GPS-linked fences. Aside from the technical systems it is developing, Autograssmilk has focused attention on using digitisation to solve an issue of direct relevance to farmers and food security in Europe. And it has highlighted the need to ensure that technologies which bring benefits in some areas don't lose them in others.

"We need to learn from and implement these solutions across the globe. A lack of access to innovation, science, and productivity-enhancing methods has prevented regions such as sub-Saharan Africa and South Asia from achieving their agricultural output potential. With proper tools and investment needed to increase production, agricultural outputs from Africa could increase from $280 billion per year in 2010 to $880 billion in 2030. In the past 60 years, a wide range of innovations in agriculture has allowed farmers to produce more while better caring for the animals and decreasing environmental impact. Throughout history, the world's biggest problems have been solved through innovation. It's celebrated in virtually every sector of the economy. However, innovation is questioned when it's linked to food," says Andre.

There is absolutely no denying that innovation has improved food production – advances in animal health and sanitation, disease detection, animal nutrition, animal comfort, artificial insemination and genetic improvements, vaccines, parasite control, animal housing and productivity optimisations are crucial to ensuring a food secure world in future, and reducing the impact on the environment.

Top solutions for a food-secure tomorrow

According to the ENOUGH movement, 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.

• **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%. We must enable innovation more than any other time in our history.

• **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.

• **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.

"Through research and innovation in our food production, we can provide solutions to deliver enough food. The question is do we have enough courage, enough leadership and enough urgency to make it happen? With the right dialogue, the right science-based policies, and the right innovative solutions, we can ensure we will have enough, without using too many of our resources. It will take solutions like innovation, choice and trade," concludes Andre.