



5 Innovations
Changing The

FUTURE OF FOOD



Forbes Innovation Team Forbes Staff
Innovation

Farming, one of the world's oldest professions, is increasingly at the cutting edge of science and technology. At the Forbes 2019 AgTech Summit, which took place Sept. 18-19 in Indianapolis, leaders from across the farming industry discussed agricultural innovations developed to solve problems including climate change and an aging workforce. Here are five factors experts say will impact the future of our food supply.

01



REGENERATIVE AGRICULTURE: HOW FARMERS ARE BATTLING CLIMATE CHANGE

An estimated **one-third** of human greenhouse gas emissions are from agriculture. Farms have the ability to help reverse this trend by making changes in their agriculture practices. These include planting more cover crops like grasses and **rotating crops**, and using organic fertilizers like manure instead of chemical fertilizers.

All of these changes result in healthier soil and the ability of farmlands to draw down carbon from the atmosphere, offsetting global warming trends. At a panel about regenerative agriculture at the Forbes AgTech Summit, Jay Watson, who works in sustainability at food producer General Mills, described the practice as “agriculture that protects but also naturally enhances” resources.



BETTER MICROBES TO GROW MORE FOOD

Microbes play a crucial role in farming—good bacteria can help plant growth, while bad fungi can decimate crops. Some companies are engineering microbes to both protect plants and enhance growth. “We’re really at a renaissance time for microbial products,” said Brynne Stanton, co-founder of Joyn Bio, at a panel about microbes at the summit.

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Bryne Stanton
cofounder of Joyn Bio

The joint venture between synthetic biology company Ginkgo Bioworks and pharmaceutical giant Bayer aims to reduce the use of synthetic fertilizer by genetically engineering microbes to provide more nutrients to crops. "It's really about going in and engineering what nature's already given us to provide additional options to growers," said Stanton. Although they haven't been tested in the field, one of the microbes Joyn scientists are working on produces a biofilm to stimulate plant growth, protect roots from destructive pests and help plants absorb nutrients from the soil.



03

PLANTS: THE FUTURE OF MEAT CONSUMPTION

Amid concerns about nutrition and climate change, plant-based meats seem like an attractive

alternative to traditional sausages and hamburgers. It's a hot area led by two new companies: Impossible Foods and Beyond Meat.

Older companies are also getting into the game in hopes of wooing a new demographic. Take Smithfield Foods, a company known for producing pork. It recently announced a new soy-based line of products including burgers, sausage, meatballs and ground meat. "We realized we needed to be in this space," said Joe Weber, who manages growth at the company, at a panel about soybeans at the Forbes summit.



USING TECH TO SAVE LIVESTOCK

Livestock disease is a nightmare for ranchers and farmers. These diseases can spread quickly, kill millions of animals a year and cost a fortune to treat and contain. Several startups are coming up with solutions to this problem. One, SwineTech, focuses not on a disease but on a destructive behavior common among pigs. The company uses sensors to detect when sows are accidentally resting too much weight on their piglets, say, while they sleep or during a feed. When a piglet's

squeal is detected, a patch on the mother's side vibrates and alerts the mother to stand up.

Another startup, Advanced Animal Diagnostics (AAD), allows farmers to quickly detect infectious disease in animals with a few drops of blood or fecal matter. Early disease detection can help farmers save money by preventing other animals from getting sick and conserving the use of antibiotics, said Joy Drach, president and CEO of AAD. "Our focus is on being the early warning that the livestock industry needs," Drach said during her pitch at the summit's THRIVE Midwest Challenge.

05



TRAINING THE NEXT GENERATION OF AGTECH FARMERS

Farming has a rich history in America, but now there are only about **two million** farms in the United States, and the average age of U.S. farmers is **58 years old**. In an effort to help more young people engage in agriculture, experts are focusing on urbanization and tech.

Jennifer Sirangelo, president and CEO of the National 4-H Council, said agricultural programs need to be positioned in addition to current educational programs. "We need to bring our youth back to the

to go to cities in addition to more traditional rural areas. "We need to bring agriculture to where the people are," she said at the summit, citing multiple 4-H programs in New York City.



We need to bring agriculture to where the people are...Young people help create technology, not just consume it."

Jennifer Sirangelo
president and CEO of
the National 4-H Council

In addition to reaching younger future farmers, a push for urbanization also helps foster more diversity. Emphasizing agriculture's growing use of technology also broadens its appeal. Agriculture jobs include positions in software development, engineering, marketing and many other common career paths. "Young people help create technology, not just consume it," Sirangelo said.



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