

AJASN AGRI – Newsletter

August 2017

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Feedback to Kate Delaney
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Thanks to Dr Rhyll Vallis, Dr Stuart Pearson, & Dr Louise Osborne



Coop, Switzerland's second-largest supermarket chain will start selling insect-based food for humans later this month.

Public sector & related

Farming Tomorrow, a [new report](#) from Policy Exchange, sets out the opportunity to reform Britain's environmental policy and approach to farming after Brexit. This [opinion](#) piece says leaving the EU could benefit UK farmers but policy must be supportive.

A report [Factory Farming in Asia](#): Assessing Investment Risks cites a number of sustainability risks (from emissions, epidemics, fraud, food safety, and misuse of antibiotics and labour) which have significant potential to derail returns.

This [paper](#) provides general conclusions about the benefits and constraints of collaborative approaches to environmental management and governance and points out knowledge gaps and key areas where more research is needed.

This [report](#) examines the use of experiments for building evidence to inform agricultural policy, providing an introduction to the field of experimental economics and discussing the increasing use of field experiments and randomised controlled trials in the social sciences and in government.

Farming

An [article](#) 'Innovation from Farm to Table' discusses investment in agricultural R&D. Here is another [article](#) on the evaluation of innovation in agriculture (it is a meta-analytical study of the literature.) This is from the first in a [new series of essays](#) from CSIRO Agriculture and Food. 'Far better than being the next food bowl for Asia, Australia has the chance to be the delicatessen, supplying high-quality, sustainably-produced, health-enhancing premium goods to a growing market both nationally and internationally.'

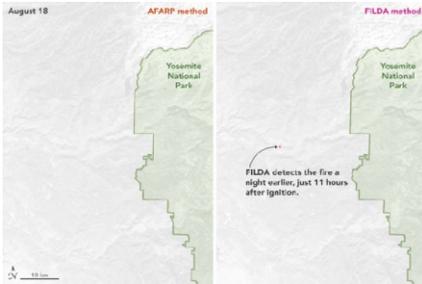
This [study](#) investigated the resilience of integrated agricultural systems to climate change (meta-analysis.) This [paper](#) says drought recovery times will worsen in the future. The global [meat industry](#) is being blamed for fuelling what is expected to be the worst dead zone on record in the Gulf of Mexico. A new [study](#) finds that agriculture has historically released almost as much carbon into the atmosphere as deforestation

This [OECD report](#) considers how the food supply chain can improve its energy efficiency (as it is still rising.) Will seafood consumption eventually replace a considerable amount of land-based meat production? This [research](#) suggests there is space on the open ocean for farming essentially all the seafood humans can eat i.e. wide scale aquaculture using much of the ocean's coastal waters could out produce the global demand for seafood by a staggering 100 times (although feed is an issue.)

This paper describes [multifunctional woody polyculture](#). The idea is to incorporate berry- and nut-bearing shrubs and trees in an alley cropping system with hay or other row crops. The combination is meant to mimic the habitat features, carbon storage, and nutrient-holding capacities of a natural system.

An early detection method for [cow lameness](#) (hoof disease), a major disease of dairy cattle, has been developed using AI artificial intelligence and image analysis.

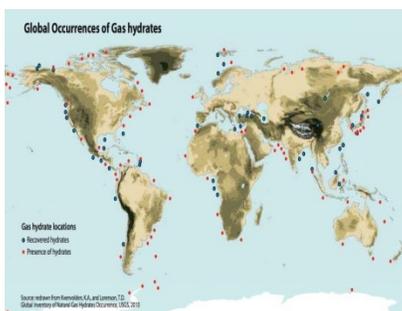
[Farmed salmon](#) are frequently deaf (a welfare issue) because of fast growth rates and this might make them unsuitable for conservation purposes (releasing them into the wild.) Fish are expected to shrink in size by [20 to 30 per cent](#) if ocean temperatures continue to climb due to climate change. Tuna, which are fast moving and require more energy and oxygen, may shrink even more.



This image shows a new method for wildfire detection. [The Firelight Detection Algorithm](#) uses visible light instead, detecting a fire possibly a day earlier.



Here is an entire issue of the magazine ... and a [review](#) of the issue.



[Gas hydrate mining](#) is taking off in China, Japan and the U.S.

Ecosystems

A new Genomic Observatories Metadatabase ([GeOMe](#)) will catalog metadata associated with biologic samples, making it easier for researchers to share and reuse genetic data for environmental and ecological analyses. This [paper](#) says mining social media posts from tourism hotspots such as coral reefs could help monitoring efforts.

University of Adelaide researchers have for the first time demonstrated that the ocean acidification expected in the future will [reduce fish diversity](#) significantly, with small 'weedy' species dominating marine environments. This [column](#) suggests a global fish war is coming (US Naval Institute.)

This [paper](#) discusses 'Tools for spatially modeling ecosystem services: Publication trends, conceptual reflections and future challenges' ([here too.](#)) This [paper](#) says that flaws in the approach to research that focuses on services ecosystems provide to humans limit certain studies' utility (to policy, industry etc.) This [paper](#) lays out a framework suggesting that index investors and adequately funded asset owners are a potential mechanism to build and sustain pre-competitive collaborations for addressing environmental and social issues

Researchers have shown that it may be possible to eradicate populations of [invasive pest](#) animals through the inheritance of a negative gene - a technique known as gene drive.

The neonicotinoid chemical thiamethoxam dramatically reduces egg-laying by queen bumblebees ([here.](#))

Climate

In August, the New York Times published an [unreleased draft](#) of a climate report written by scientists from 13 U.S. federal agencies.

An [experiment](#) in getting people to care about climate change uses videos, charismatic scientists and calls to action. Australia has a critical shortage of [climate scientists](#), leaving it at serious risk of not delivering essential climate and weather services to groups like farmers, coastal communities and international organisations. A [study](#) based on historic emissions and economics, suggests that there's a 5 percent chance of the world meeting the agreed target of a 2 °C temperature rise by 2100. (The goal of 1.5 °C has about a 1 percent chance.) In just 35 seconds, [a new video](#) illustrates how drastically temperatures in each of the world's 191 countries have changed over the last century

[New research](#) says parts of the world (e.g. South Asia) will become so hot and humid that a healthy adult sitting in the shade will die within a matter of hours. This [research](#) says air pollution caused by climate change will cause about 60,000 extra deaths globally each year by 2030, and 260,000 deaths annually by 2100, as a result of the impact of these changes on pollution. A new [study](#) suggests that extreme weather events could kill as many as 152,000 people a year in Europe by 2100. Climate change may have led to more than 59,000 suicides over the past 30 years on Indian farmers, who are vulnerable to small changes in growing conditions, according to this [paper](#). People in 47 countries may lose more than 5 percent of their dietary protein by 2050 ([protein](#) deficiency) as a result of human-caused carbon dioxide emissions (& [here.](#))

This [piece](#) makes the case for a geoengineering method known as marine cloud brightening, which involves spraying saltwater into marine clouds to reflect heat back into space. Backed by \$3 million in federal funds, China is building out one of the biggest [geoengineering research](#) programs on the planet.

Scientists say the ongoing [Arctic ice loss](#) can play an active role in altering one of the planet's largest water circulation systems that play a major role in regional and global climate, affecting the Atlantic rim countries -- particularly those in Europe.

Challenges of Agriculture in a Climate Change Context by 2050 ([AgCLIM50](#)) a report published in June 2017, provides an analysis of the associated impacts of mitigation and adaptation in the agricultural sector.

Health

[Swine brucellosis](#) carried by feral pigs is emerging in New South Wales and it has caused illnesses in people; it is endemic to feral pigs in Queensland.

Chemists were able to remove about 99 percent of bisphenol A (BPA) from water using a mixture of hydrogen peroxide and engineered catalysts, according to [a study](#).

This [article](#) suggests that Britain might be forced to accept lower US food standards if a trade deal is struck post-Brexit. It asks: What if enhanced global trade, far from promoting wellbeing, now undermines it?

A team of researchers have genetically engineered pigs, [removing](#) viruses to make transplanting their organs into humans safer. This could be a game changer (i.e. 'the future of organ transplants is organ farming?') Early [research](#) suggests that misfolded proteins via blood transfusions, or even food, may spread diabetes (i.e. like mad cow disease.)

Our call patterns (i.e. people we call) can be used to predict patterns in where we travel, according to new [research](#). This in turn can shed light on how an epidemic would spread. This [research](#) says changing something as simple as airplane boarding patterns can have a significant impact on the global spread of an infectious disease.

An [article](#) updates knowledge on the Fipronil egg scandal In the EU.

A report released by an advocacy group (Environmental Justice Australia) analyses [toxic emissions from Australia's coal-fired power plants](#).

The lakes, rivers and seas of two large cities in Brazil (Rio, Sao Paulo) are becoming major sources of multidrug-resistant bacteria according to this [research](#) that records 'superbugs' in these waters for the first time.

This [study](#) looked at children's snack food purchasing habits (healthier choices.)

The impact of climate change on emergence and spread of infectious diseases could be greater than previously thought, [research](#). A European study recently took a broad look at what kind of [microorganisms](#) are most likely to be affected by climate change (i.e. human and domestic animal pathogens).

Low-cost British carrier, Monarch Airlines has teamed up with an Oxford University food psychologist professor to come up with an [in-flight menu](#) which is 'guaranteed' to take the stress out of flying.

Urban

This report draws lessons on 'What makes [urban food policy](#) happen?' from five case studies discussing the ways in which five cities around the world have developed urban food policies.

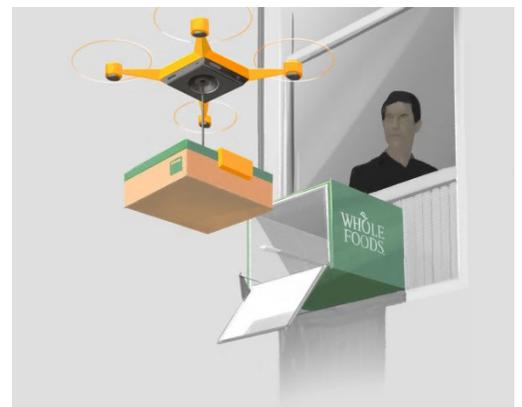
A [study](#) finds blocking the opening of a new fast-food restaurant, or subsidising a local supermarket, will do little to reduce obesity. Opening a supermarket in a ['food desert'](#) caused little improvement in the net availability of healthy foods.



A PhD student created milk-and-sugar capsules that dissolve completely when placed in hot liquid ([source](#).)



Food waste map ([source](#)) and an [article](#) what's working (i.e. Governmental Plans to Address Waste of Food)



A design firm looked at what [food retail](#) might look like in the future if run by Amazon / Whole Foods ... drones, shared refrigerators, hydroponic garages, and never setting foot in a grocery store again.

Science & technology

An Australian biologist and a computer scientist have [published a paper](#) outlining their study of climate change using neural network technology (big data and artificial intelligence) – their results show that the climate changes the world is now experiencing are almost completely natural. (Here is a related [Blog](#) post.)

This article analyses [online news reporting](#) of 3D printed food technology.

Finnish scientists have come up with a [synthetic food](#) that requires only carbon dioxide, water, microbes, and electricity to produce a food powder. It is not yet commercially viable – it can be produced independently of environmental factors necessary for agriculture.

For the first time, [researchers](#) have mapped the complete genome of two closely related pests potentially saving the international agricultural community billions of dollars a year (the Cotton Bollworm and Corn Earworm).

Specially designed plastic films can prevent bacterial contamination in the food and biomedical industries, according to this [research](#).

[Methane-soaked ice](#) is the newest, strangest resource competing to be in the list of exploitable fossil fuels.

A research team used high-resolution [geospatial modelling](#) to quantify the effects of land, energy, and water infrastructures on the nation's rivers and streams.

This [research](#) looked at soil as a biosecurity risk.

The WBCSD released a [report](#) on water smart agriculture in India.

This article discusses [nanotechnology](#) in agriculture. This article discusses the [sustainable intensification](#) of agriculture.

Forward 'looks'

The Royal Society's '[Future of oceans](#)' project considers how we might use the mineral and genetic wealth of the oceans, as well as the drivers and wider consequences of doing so.

Here is a [paper](#) on Scenario analysis to determine possible, plausible futures for the New Zealand dairy industry.

(In March) the Pardee Center for the Study of the Longer-Range Future published a research [report](#): The Risks of Multiple Breadbasket Failures in the 21st Century: A Science Research Agenda. Here is a [paper](#) on 'Future urban land expansion and implications for global croplands.'

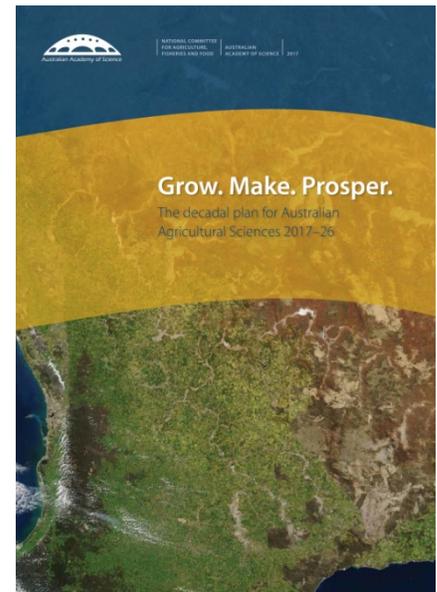
The USDA published an [international food security](#) assessment to 2027.

Assumptions

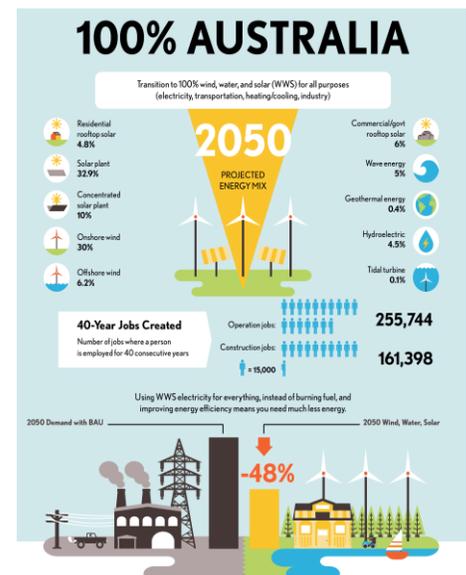
Citizens, consumers and farm animal welfare: A meta-analysis of willingness-to-pay studies – [here](#).

Here is an article on the 'new' [science of domestication](#).

People's [beliefs about scientific topics](#) that are associated with their political or religious identities actually become increasingly polarised with education, as measured by years in school, science classes, and science literacy.



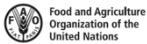
Click [here](#)



Click [for infographic](#). Click for forthcoming journal [article](#).



The Little Free Pantry [movement](#) has made it to Australia and New Zealand.



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AFRICA SUSTAINABLE
LIVESTOCK 2050

Technical Meeting and Regional Launch
Addis Ababa, Ethiopia
21-23 February 2017

Click [here](#)

News

China [temporarily banned](#) beef exports from six Australian meat works; for labelling problems. At the same time it is importing U.S. beef for the first time in 13 years.

Data61 (CSIRO) has [partnered](#) with agribusiness network Ruralco to develop data and emerging technologies solutions to improve efficiency and sustainability in the agriculture sector.

South Korea is planning to build an [agricultural city](#) worth \$10bn in Egypt.

The Western Australian Planning Commission published [guidelines](#) for planning in bushfire prone areas.

The earliest Earth Overshoot Day ever, on August 2, was big news in France this year, making the front page of [Le Monde](#) and prompting a 3-minute [video](#) from Nicolas Hulot the French Minister of Ecological Transition.

A university spin-off has set up a company (an online platform) to tackle [invasive plants](#) in Switzerland. The business model is interesting.

The EU launched an Anomaly Hot Spots of Agricultural Production ([ASAP](#)) early warning system.

UK Food minister George Eustice [said](#) there were "no potential scenarios" where the UK's food supplies would be affected, including if Britain was forced to rely on World Trade Organisation rules.

Nestle, Unilever, Tyson Foods and other large food and retail companies have joined IBM's project to explore how [blockchain](#) technology can help track food supply chains and improve safety.

Australia's funding for all 12 sites in Australia's Long Term Ecological Research Network ([LTERN](#)) will stop in 2017.

NSW issued a report on stock theft and trespass ([review.](#))

The Australian Senate issued a [report](#) - Australia's dairy industry: rebuilding trust and a fair market for farmers.

A [peer reviewed](#) article says Exxon misled the public when communicating about climate change.

The Natural Capital Coalition launched the [Natural Capital Protocol Toolkit](#).

Web

Check out the 90 second [video](#) stories on climate change. Here is another [newsletter](#) to explore. This is an online [course](#) on antimicrobial resistance in the food chain.

12 September 2017 Oxford [free webinar](#): Using scenario planning to reshape strategy and a related [paper](#).

Upcoming meetings

Next meeting 6 December 2017