

What's around the corner in EggTech?

AgTech has exploded globally in the last five years, attracting new types of innovators and investors all seeking to bring the power and potential of technology to agricultural value chains.

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The AgTech sector can help Australian egg farmers respond to the growing, changing demands of consumers. While not a silver bullet, new technologies have the potential to help farmers produce more with less, while also improving profitability, saving time and improving safety.

AgTech can be perceived as a fast-paced, potentially overwhelming space, with products being built that don't necessarily fit the needs of farmers. But there are real, robust, practical solutions already available or soon to hit market that can provide value. As many of these technologies are based overseas, Australian Eggs is undertaking a "technology scouting" project led by agtech advisory firm AgThentic. Here is a sneak preview into the findings of the project.

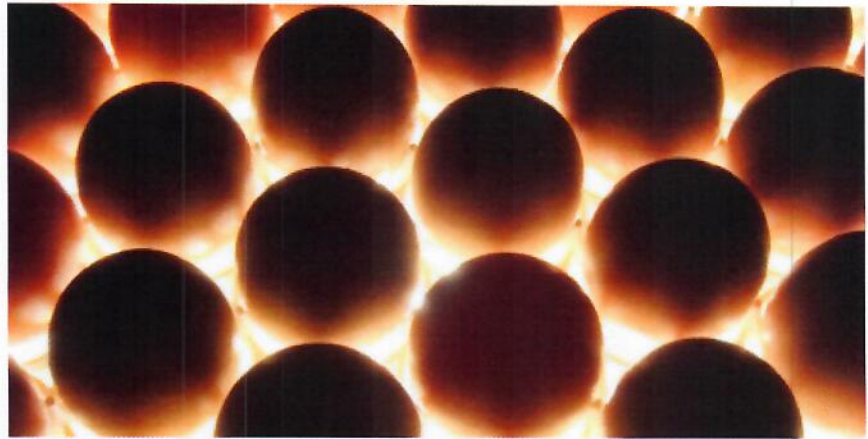
Egg sexing

What is it?

Egg sexing refers to a variety of methods that can determine the gender of eggs before they hatch ('in ovo'). By identifying gender early, the labour-intensive process of chicken sexing is eliminated and social license issues around euthanising male chicks are avoided.

State of the market globally

Internationally, the race is on to be first in market with an accurate, affordable solution for high throughput in ovo egg sexing.



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In the Netherlands, the company In Ovo has developed a technology that extracts a small sample of allantoic fluid from a tiny resealable hole and tests for biomarkers of gender. In Germany, Seleggt's endocrine testing process uses a machine to extract a minimal amount of allantois from eggs after nine days to test for estrone sulphate, a female hormone. Seleggt's Respeggt brand of eggs is already on shelves in Germany and the company is working to commercialise the technology for use by other hatcheries in 2020.

Other projects, such as Israel's eggXYT have looked to use gene editing technology to insert biomarkers on the DNA of chicks. However, gene editing techniques may face regulatory challenges.

Techniques that require extraction of fluid need to achieve extremely high throughput and accuracy, while minimising negative effects from sampling.

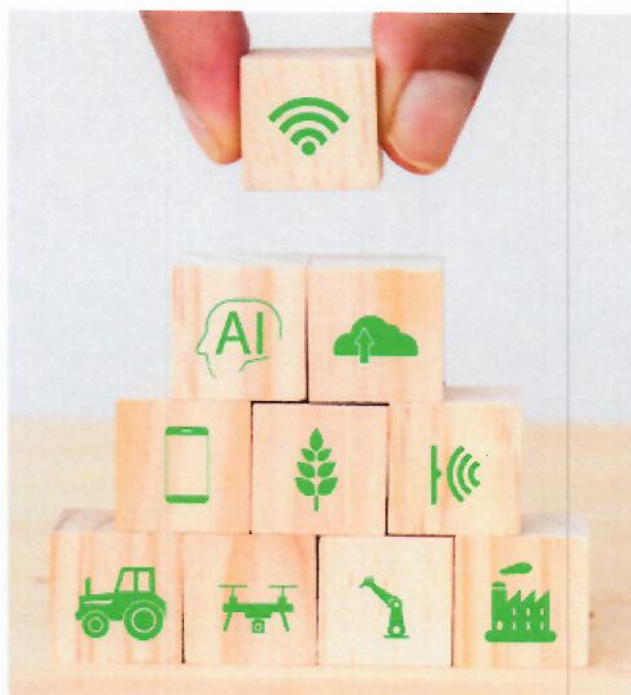
Why should farmers care?

The obvious benefit is the currently unavoidable practice of euthanising male chicks could be removed. This would be likely to have benefits from a social licence perspective and could help the egg industry increase public trust. Commercially, the technology would deliver flow-on reductions in costs from reduced chick hatchings.

MATURITY	Not yet commercially available. Predicted to be in market within 2 years.
PROJECTED COST	< 5 cents per egg
COMPANIES	<ul style="list-style-type: none"> - eggXYT (Israel) - Ovabrite (USA) - In Ovo (Netherlands) - Seleggt (Germany) - SelectEggz (Australia) - HyperEye (Canada)



Tibot Technologies' Spoutnic Rover is an autonomous, wheeled robot that patrols the shed.



Integrated sensor and software solutions combine a variety of sensors with data analytics so farmers can monitor key indicators in real-time.

Robots and floor eggs

What is it?

Robotic technology is being explored for its potential to autonomously navigate poultry sheds to reduce the incidence, and automate the collection, of floor eggs in cage-free operations and breeder houses.

State of the market globally

Both research and commercial projects are happening in this space internationally. In France, Tibot Technologies' Spoutnic Rover is an autonomous, wheeled robot that patrols the shed emitting lights and sounds to replace the need for walkthroughs and encourages chickens to nest in their coops. In one trial, a constantly-patrolling Spoutnic reduced the number of floor eggs by 23 percent.

Multiple universities are developing robots that go one step further and collect floor eggs. Georgia Tech's GOHbot, for example, is able to navigate around chickens using technology similar to that used in autonomous vehicles.

Why should farmers care?

Reducing labour-intensive tasks such as walkthroughs and collection can deliver improved margins for farmers.

MATURITY	Robots targeting reduction of floor eggs are already available. Robots able to collect floor eggs are not yet in market.
PROJECTED COST	\$10,000 AUD
COMPANIES	- PoultryBot (Netherlands) - GOHBot (USA) - Tibot Technologies (France)

Sensors, algorithms and data

What is it?

Integrated sensor and software solutions are another relevant area of technology development. Solutions being developed for use in broiler farms have application and potential utility for the egg industry. These products combine a variety of sensors with data analytics so farmers can monitor key indicators in real-time, such as ammonia levels in the shed, feed levels, and hen welfare.

State of the market globally

In the US, Little Bird System has created Feedcast - a wireless feed inventory control system that tells farmers how much feed is remaining in livestock feed bins and thereby eliminates the risk of running out of feed or over-ordering. Australian company Feedworks' Feedmeter measures the feed flow through a feed line using patented mass flow sensing technology, reducing feed outages

and allowing farmers to track feed intake.

Applied Group in the UK has created OptiFarm, a full service offering able to gather all types of farm data, from water consumption to activity levels, feed availability, environmental CO₂ and RH%, and disturbance rates.

In Spain, Faromatics' ChickenBoy is a world-first, roof-suspended robot that observes chickens autonomously 24/7, reporting on air quality, health and welfare.

Why should farmers care?

The technologies available in market today can help farmers monitor their flocks in real-time, including notifications of flock needs, such as feed, water, or environmental conditions. This reduces the labour costs of checking sheds manually, while preserving precise environmental conditions and flock health and welfare.

MATURITY	Many of these technologies are already in use in broiler farming but few tools have been specifically developed for layers at this time.
PROJECTED COST	Varies by systems and operation size
COMPANIES	- Achmea (Netherlands) - Little Bird Systems (USA) - Feedworks (Aus) - Applied Group (UK) - Faromatics (Spain)