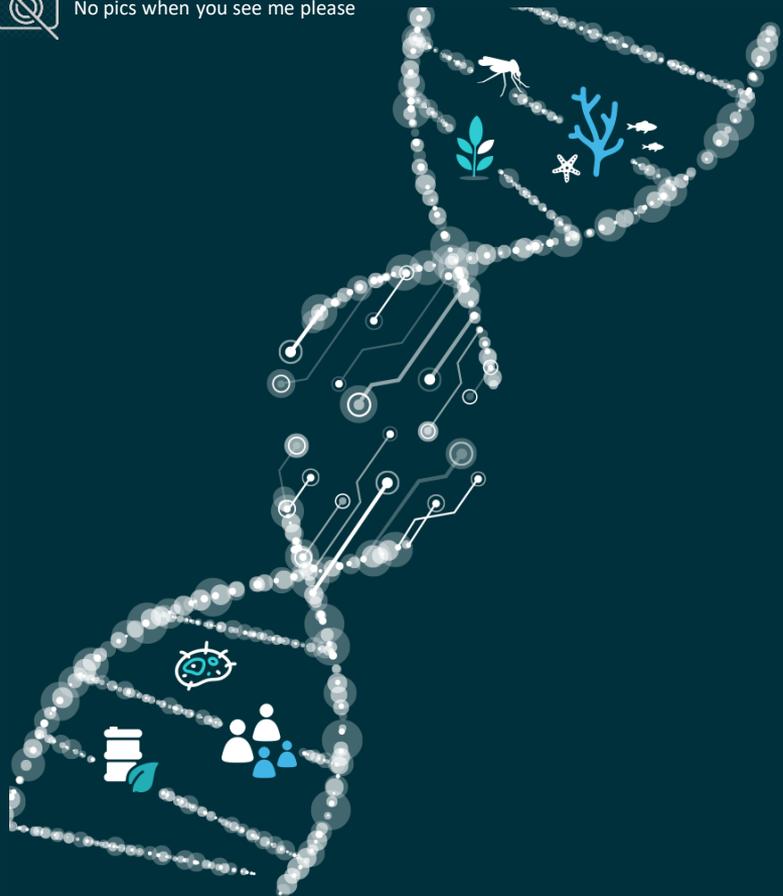




No pics when you see me please



# Public perceptions of using synthetic biology to prevent the culling of male chicks

Dr Aditi Mankad  
Dr Lucy Carter  
Dr Elizabeth Hobman





# Survey Purpose

To obtain a baseline understanding of national attitudes

- Inform science planning and direction
- Inform a public engagement process
- Improve our understanding of human decision-making, risk perception and values



Australia's National  
Science Agency

## Public perceptions of using synthetic biology to prevent the culling of male chicks

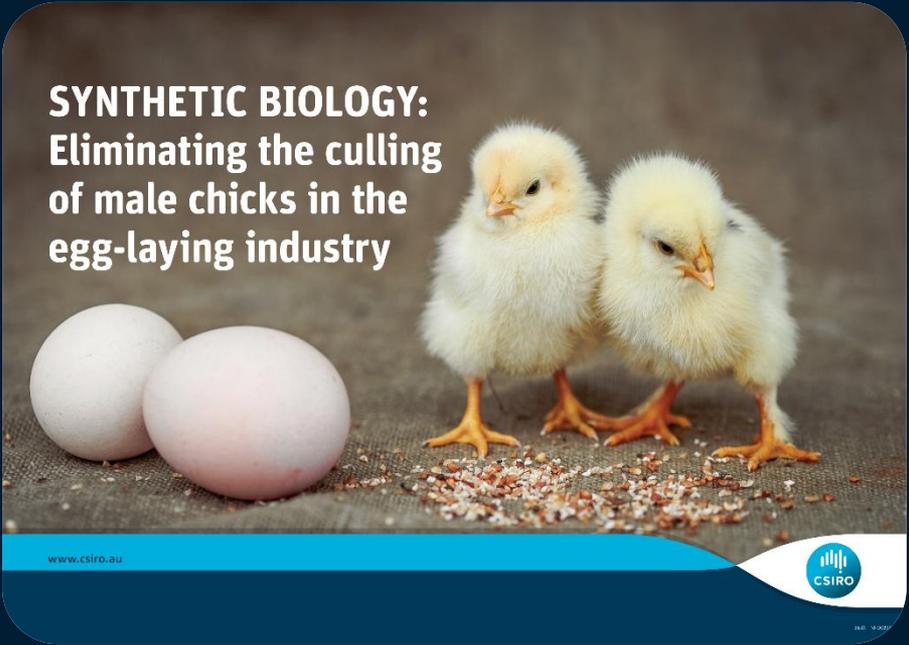
Synthetic biology technologies, such as gene marking, could eliminate the need for culling male chicks in the egg-laying industry





# Background narrative

- Co-developed with biotechnical scientists (Tizard, Doran, Cooper, Woodcock, Jenkins)
- Iterative process
- Validated via public focus groups





# Storyboard

- Male chicks not sustainable for meat production; humanely culled
  
- Synbio techniques enable scientists to place marker gene on male chromosome; produces special protein visible when illuminated



## Storyboard (cont...)

- Males are removed from production; females incubated, hatched as usual
  
- Gene marking could remove need for culling male chicks, potentially reducing industry costs and improving industry sustainability



**This technology would likely be approved and/or regulated by:**

The Office of the Gene Technology Regulator

The RSPCA

Food Standards Australia New Zealand

- Together these regulatory bodies and standards would ensure that:
- The research and development occurs under controlled laboratory conditions, and
  - Any environmental and health risks or concerns are properly reviewed and addressed.

## Regulation

## Engagement



**Australian residents like you may have the opportunity to ...**

Take part in public events where scientists share their research on the technology

Participate in online or face-to-face discussions to ask questions and share your thoughts about the technology

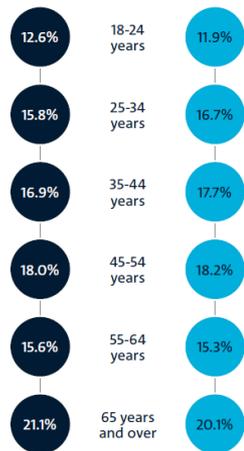
Sign up to receive regular updates on the technology development



# Sample

## Australian demographic data

All surveys and this specific survey

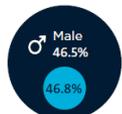


● Overall data ● Study specific data



8037  
Australians

1148  
in gene marking  
of chickens study



# SYNTHETIC BIOLOGY: Eliminating the culling of male chicks in the egg-laying industry



Thank you for taking part in this online survey - it will take approximately 15 minutes to complete.

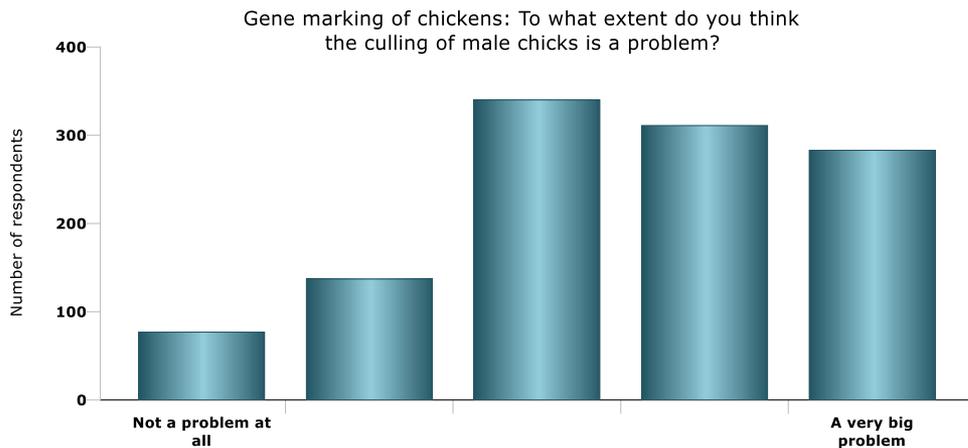
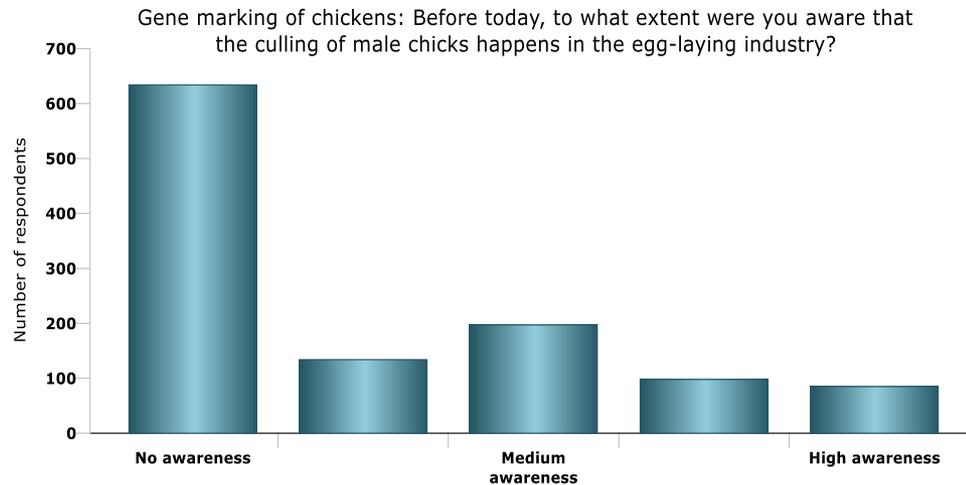
The Commonwealth Scientific and Industrial Research Organisation (CSIRO) is conducting this survey to better understand what the public thinks about new biotechnology, specifically, synthetic biology. You do not need to know anything about synthetic biology to participate. The survey you receive will be based on one of seven different hypothetical technologies, assigned randomly to all participants. The findings of this study will be used to inform scientists, policy-makers and other Australians about general public perspectives regarding the development and application of possible new biotechnologies in Australia.

The research is being funded by the CSIRO Synthetic Biology Future Science Platform.

Your participation is completely voluntary and you are free to withdraw at any time by closing the browser window prior to submitting your survey; your data will subsequently be deleted. The survey findings may be presented at industry and academic conferences, and in research articles and reports. Your responses will be combined with those of many other participants, and you will not be personally identified in any reporting.

This study has been cleared in accordance with the ethical review processes of CSIRO, within the guidelines of the National Statement on Ethical Conduct in Human Research. If you'd like to find out more about the research, please contact the research team via email at [SynBio\\_MI@csiro.au](mailto:SynBio_MI@csiro.au) or phone [07 3833 5611](tel:0738335611). Any concerns or complaints about

# Problem awareness and perception



↑ Low awareness of problem

← Culling viewed as problematic

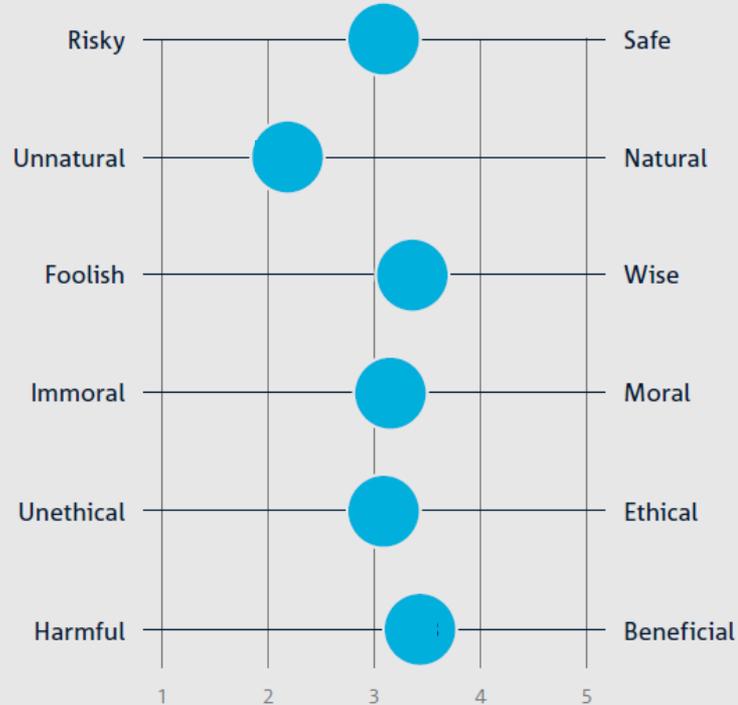


Emotions indicated by Australians\*



Emotion

Attitudinal pairs\*



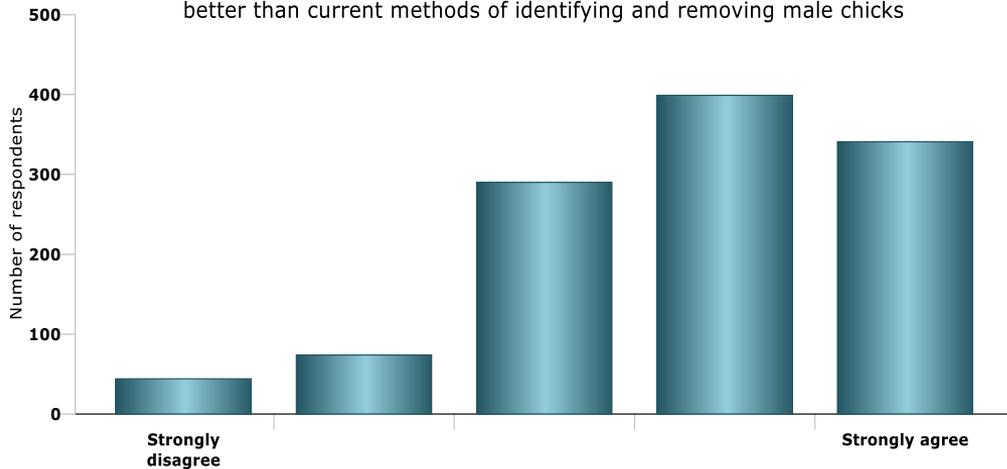
Attitudinal affect

\*Data range: 1 – 5

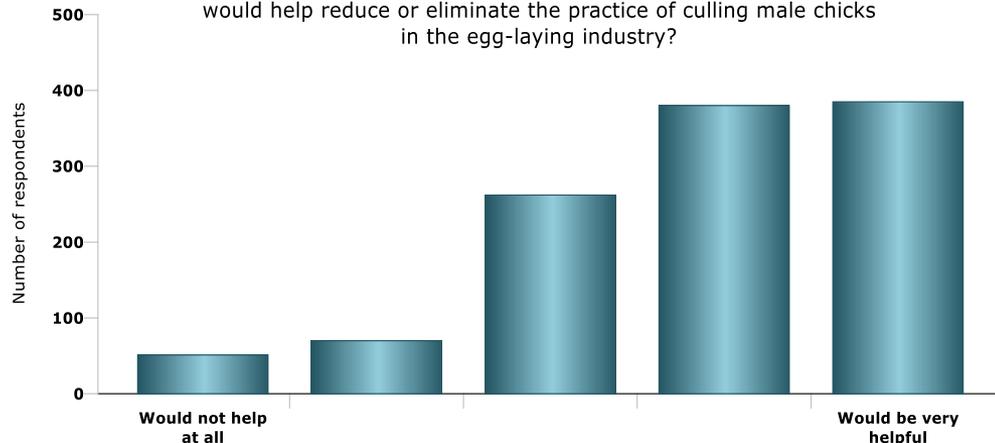


# Expected benefits

Gene marking of chickens: I think that this new technology would be better than current methods of identifying and removing male chicks



Gene marking of chickens: To what extent do you believe that this new technology would help reduce or eliminate the practice of culling male chicks in the egg-laying industry?



↑  
Strong belief that new tech would help reduce/eliminate culling male chicks

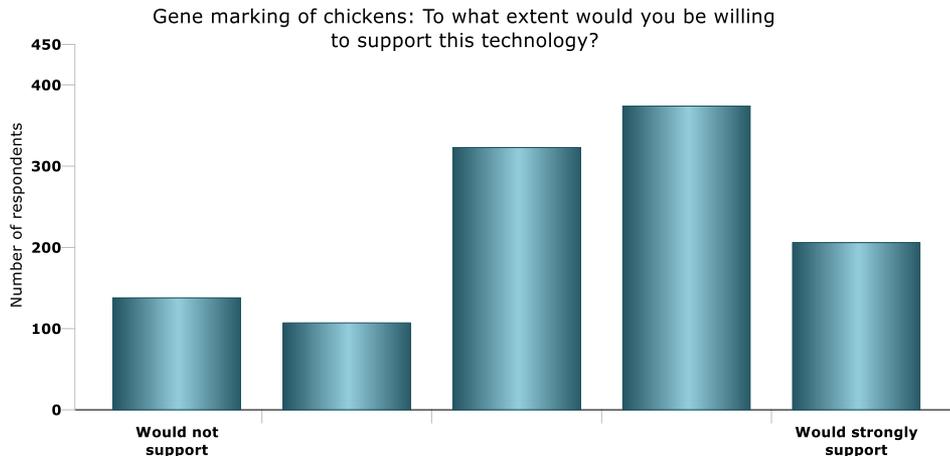
← Relative advantage of synbio solution over current practices



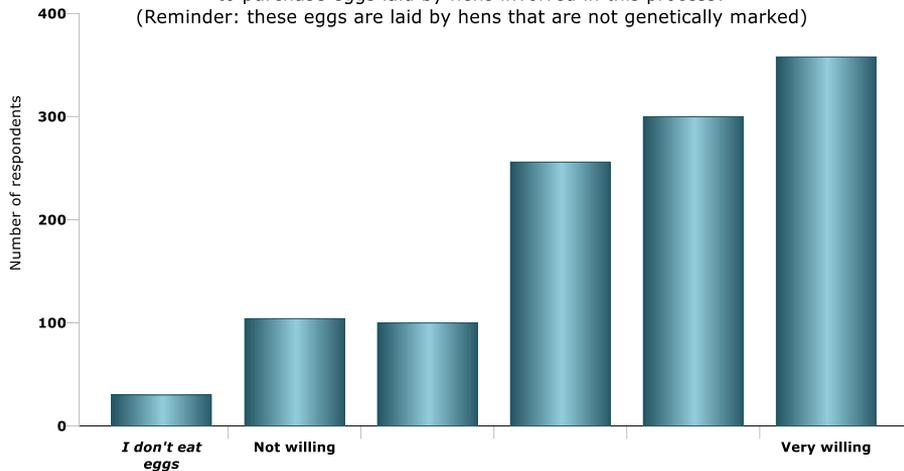
# Support



Moderate to high support  
for development of this  
technology



Gene marking of chickens: To what extent would you be willing to purchase eggs laid by hens involved in this process?  
(Reminder: these eggs are laid by hens that are not genetically marked)



Strong willingness to purchase  
eggs laid by hens involved in this  
process



# Perceived risks/concerns

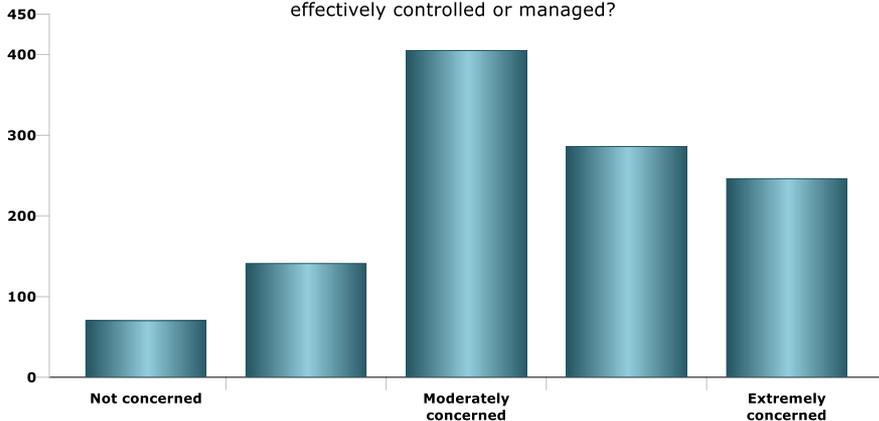
Most are at least moderately concerned about the long-term effects on environment, humans and animals



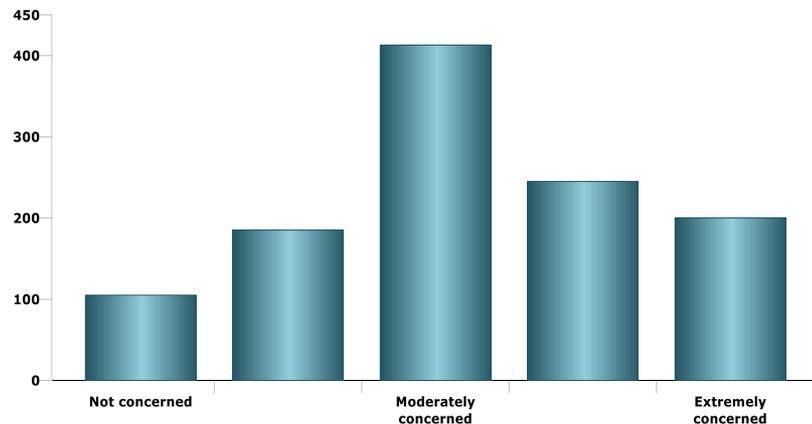
Moderate-high concern that consequences can be controlled



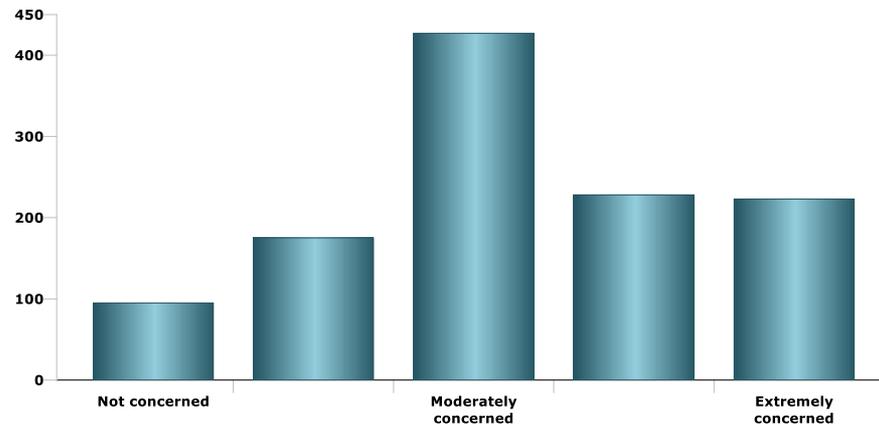
Gene marking of chickens: To what extent would you be concerned about whether the consequences of the technology can be effectively controlled or managed?



Gene marking of chickens: To what extent would you be concerned about the long-term effects on the natural environment?



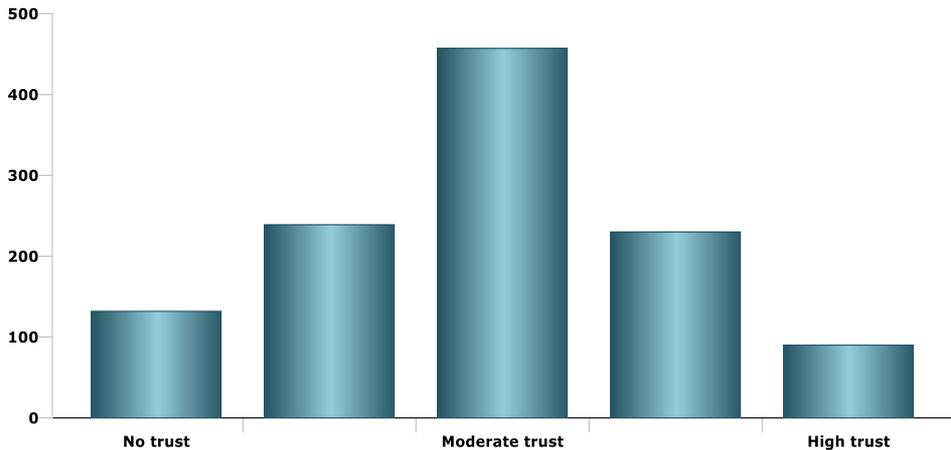
Gene marking of chickens: To what extent would you be concerned about the long-term effects on humans and animals?



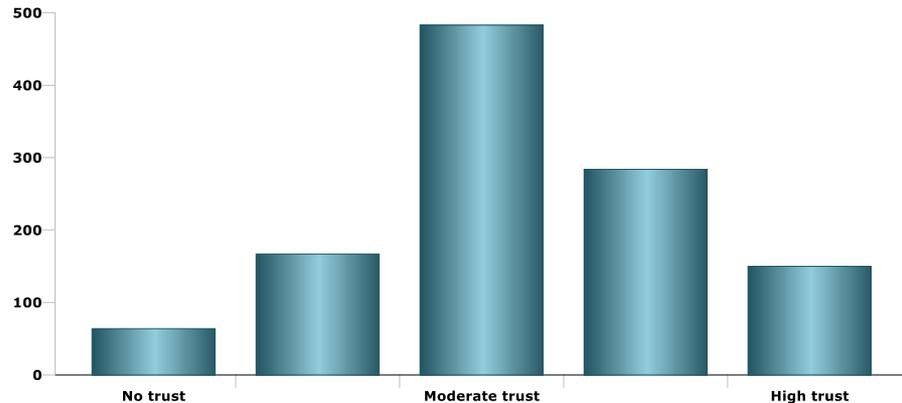


# Trust

Gene marking of chickens: How much do you trust the government agency that would be responsible for approving/regulating the technology?



Gene marking of chickens: How much do you trust that scientists working on this technology would develop it responsibly?



Most are moderately trusting of scientists

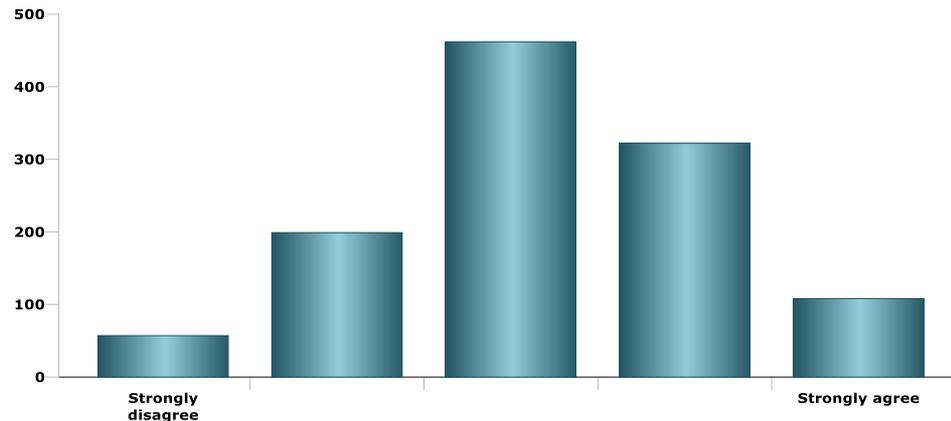


Slightly less trust in the governing agency

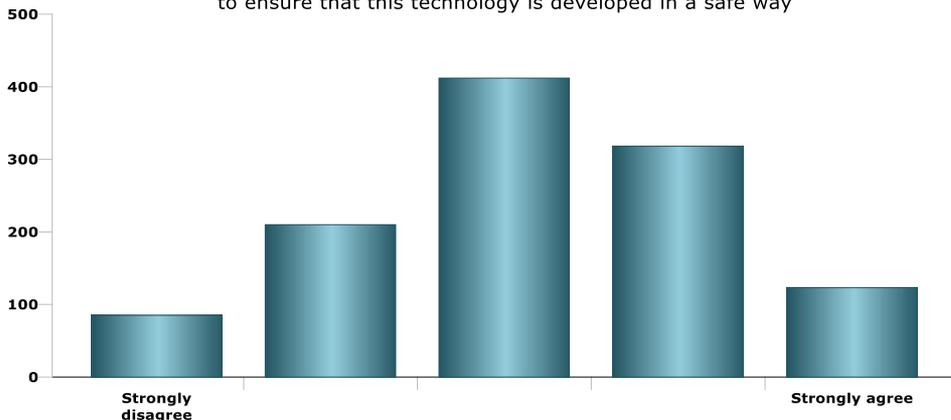


# Confidence in governance

Gene marking of chickens: I think that this technology will be well regulated



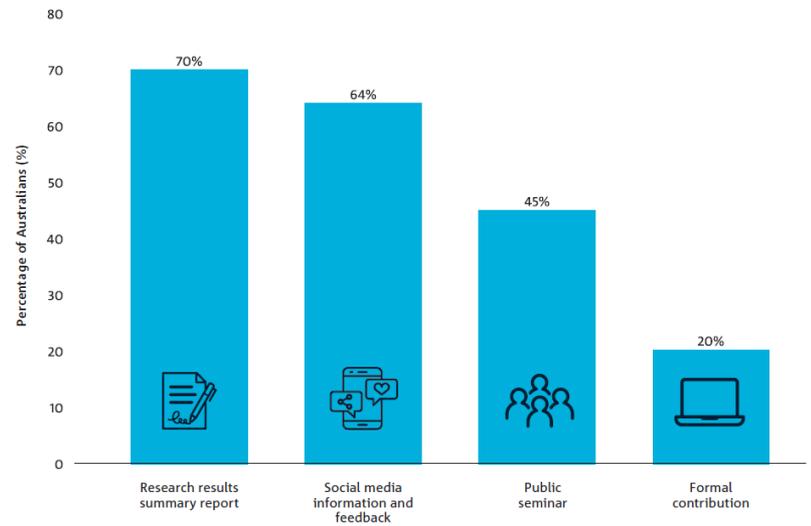
Gene marking of chickens: I think legislation and regulation can be counted on to ensure that this technology is developed in a safe way



- ❖ Many middle-ground responses
- ❖ Generally, more confident in governance than not – might be a product of national experience on other matters



# Public involvement



Which of the following most accurately reflects your feelings about the appropriate level of public involvement when it comes to making decisions about this technology?

N

%

**The public should be consulted with, and their opinions considered, when making decisions about this technology**

472

41.1%

**The public should be kept informed of decisions made about this technology**

405

35.3%

**The public should be directly involved in making decisions about this technology**

144

12.5%

**The public does not need to be involved in decisions about this technology**

52

4.5%

**Don't know**

75

6.5%

# Public information needs

- ❖ Information about risks, the regulation/control aspects, and what is being done to deal with the social and ethical issues all featured strongly

Please select the top three issues you would like to hear more about related to this technology:	Rated as #1	Rated as #2	Rated as #3	TOTAL
<b>What the possible risks are</b>	283	189	155	627
<b>What is being done to regulate and control the technology</b>	177	222	192	591
<b>What is being done to deal with the social and ethical issues involved</b>	108	142	142	392
<b>Who will benefit and who will bear the risks</b>	71	106	138	315
<b>Who is funding the research and why</b>	110	93	111	314
<b>What the scientific processes and techniques are</b>	89	90	101	280
<b>What the claimed benefits are</b>	67	63	66	166



# Insights from the qualitative data...

*In deciding whether you'd support this technology, what influenced your decision? What is your main reason for supporting it, or not supporting it?*



# Higher level themes arising...

## INTRINSIC CONCERNS

Tampering with nature

Playing God

Interfering with the natural order

Slippery slope references

## EXTRINSIC CONCERNS

Unforeseen consequences

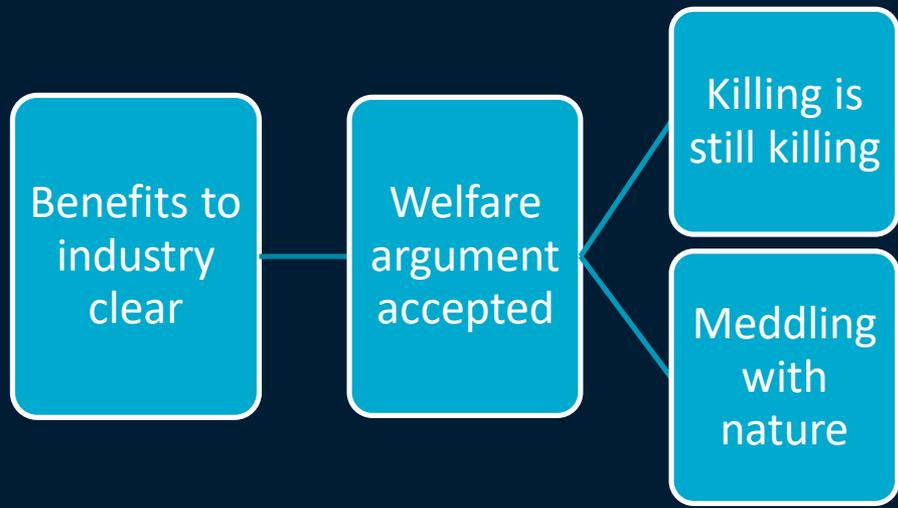
Uncertainty about future impacts

Initial shock of learning about  
existence of culling



## Theme 1 – Internal tension

*“Its really hard. It seems good that they aren't culled, and no doubt cheaper for producers. I just hate meddling with nature.” [C0421]*





## Theme 2 – ‘Tampering with nature’ sentiment

*“Because it is tampering with nature.” [C203]*

- ~20% of data set contained intrinsic objection of some type
- In other synthetic biology scenarios we’ve explored, this type of intrinsic objection readily comes with an explanation.
- For chicks scenario, an explanation was uncommon.

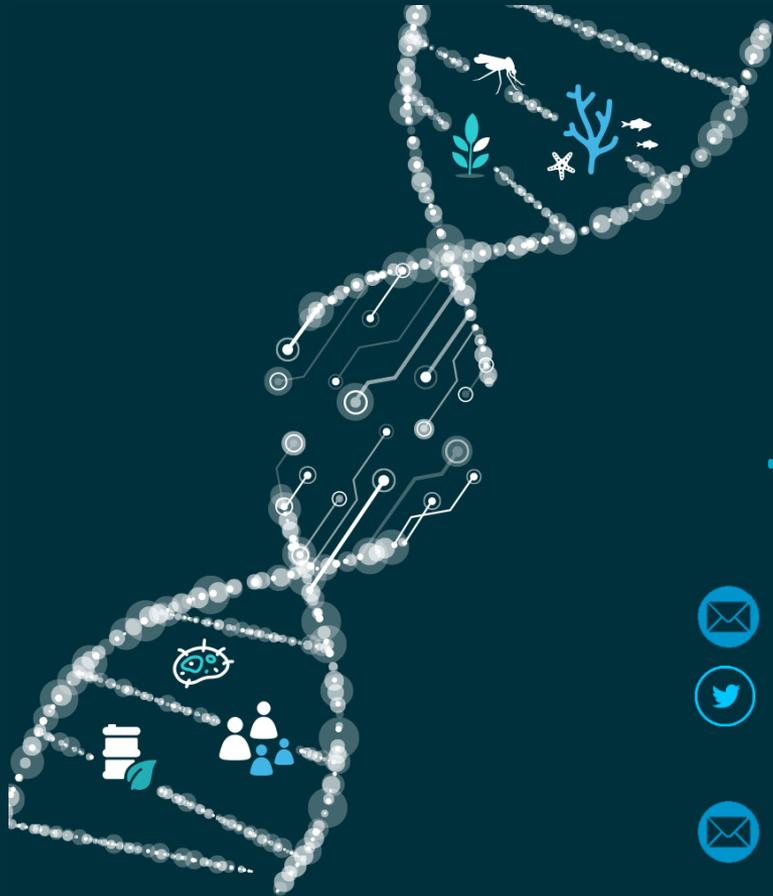
# How should the science community engage?

- As transparently and respectfully as possible
- Resist carrying across myths - not all moral objections are nonsensical
- Engage with those who want to be engaged – focus on problem-solution, not biotech push.



# Summary

- Low awareness of problem, but most view culling as a moderate to very big problem
- Technology is generally viewed as beneficial by most, however, uncertainties regarding long-term consequences and management of risks remain
- Majority support the technology, around 20% less supportive
- Moderate degree of trust in the scientists and governing agency, but still room for improvement
- Many favour a passive information exchange model
  - People want some level of involvement in the future (consulted with, to have some say over tech development and implementation, to be kept informed, to know more about risks)



# Thank you



[aditi.mankad@csiro.au](mailto:aditi.mankad@csiro.au)



@dr\_deets



[lucy.carter@csiro.au](mailto:lucy.carter@csiro.au)