

A scenic landscape with rolling green hills, a distant mountain range, and a person standing in the foreground. The sky is blue with some clouds. The text is overlaid on the image.

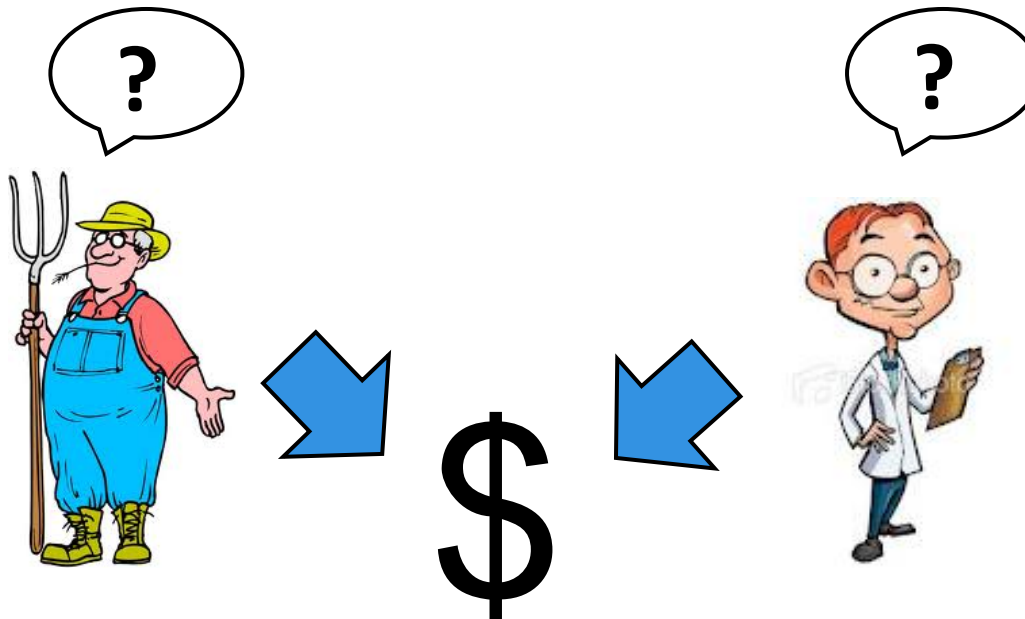
# **MAKING CHOICES: PREFERENCE-BASED APPROACHES TO DERIVING BREEDING GOALS**

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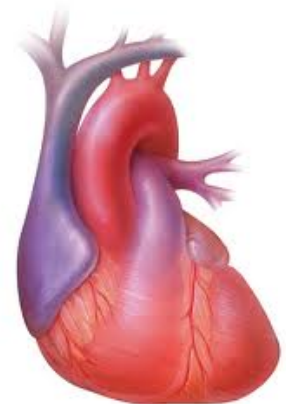
**Application to sheep, dairy cattle, and plant breeding**



- Scientists design breeding goals
- Not always the same as farmers breeding goals
- How can we better develop breeding goals that align the opinions of scientists and farmers?



- Software called *1000Minds*
- Allows surgeons to rank patient for heart surgery in a fair way
- Objective and transparent
- Very successful in the health system
- Used widely in all sorts of fields





- **Ranking the importance of traits**

- ... for wool sheep in Australia (Meat & Livestock Australia)
- ... for dairy cattle in New Zealand (DairyNZ)
- ... for meat sheep in Ireland (Sheep Ireland)
- ... for pasture plants in Australia (Dairy Futures CRC, Meat & Livestock Australia)



- For the Australian fine-wool industry we want to:
  - ▣ Rank the importance of traits
  - ▣ Assess whether breeding objectives align with industry expectations
  - ▣ Determine differences in trait ranking across the range of varying wool types within the industry
- **Understand the opinions of farmers**
- **Design better breeding goals**



# Wool sheep



- Surveyed breeders and farmers of fine-wool sheep
- General information survey:
  - ▣ Direction
    - Fine wool retaining wethers , dual purpose, or Merino wool selling wethers
  - ▣ Category
    - Registered or commercial breeder, or ram buyer
  - ▣ ...
- *1000Minds* survey





# The questionnaire



**Which of these 2 (hypothetical) flocks do you prefer?**  
(given they're identical in all other respects)

(Left)

**b Increase adult clean fleece weight by 0.5 kg**

or

(Right)

**c Increase hogget weight by 5 kg**

this one

they are equal

this one

this one is impossible

skip this question for now

this one is impossible

**Trade off**



# Results - General



- 350 breeders/ farmers completed the survey
- Largest respondent groups were:
  - ▣ Over 50 years-of-age
  - ▣ Registered breeders
  - ▣ Merino wool producers selling surplus animals





# Results - General



- Wool style percentages from survey:
  - ▣ 17% medium
  - ▣ 37% fine-medium
  - ▣ 27% fine
  - ▣ 16% super-fine
  - ▣ 4% ultra-fine
- Balanced industry representation



# Results – trait ranks



10

Trait	Rank (farmers)
Weaning percent	<b>1</b>
Fleece weight	<b>2</b>
Hogget weight	<b>3</b>
Worm egg count	<b>4</b>
Staple strength	<b>5</b>
Fibre diameter	<b>6</b>
Adult weight	<b>7</b>



# Results – trait ranks



11

Trait	Rank (farmers)	Current rank	Correct rank?
Weaning percent	<b>1</b>	<b>1</b>	
Fleece weight	<b>2</b>	<b>3</b>	
Hogget weight	<b>3</b>	<b>4</b>	
Worm egg count	<b>4</b>	<b>7</b>	
Staple strength	<b>5</b>	<b>5</b>	
Fibre diameter	<b>6</b>	<b>2</b>	
Adult weight	<b>7</b>	<b>6</b>	



- Lower preference for improvements in fibre diameter
- Higher preference for improvements in worm egg count
- Customised indexes & ram rankings for specific farming circumstances



- By direction
  - ▣ Fleece weight most important fine wool breeders  
least important dual purpose breeders
  - ▣ Strength most important fine wool breeders least  
important dual purpose breeders

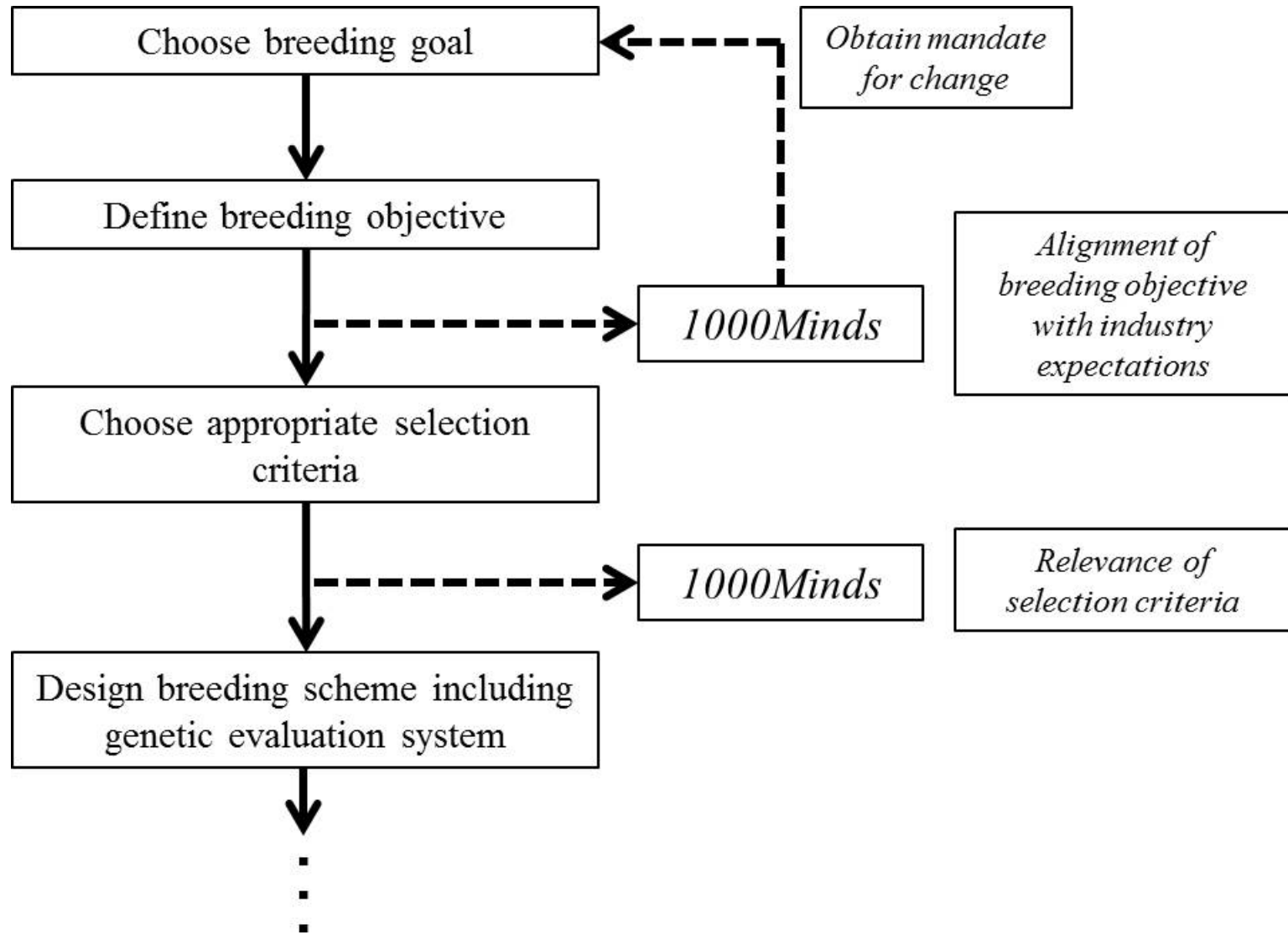




- By category
  - ▣ Hogget weight most important for commercial breeders, least important for ram buyers
  - ▣ Breech wrinkle most important for ram buyers, least important for registered breeders
  - ▣ Length most important for registered breeders, least important for ram buyers



# Programme design





# Key points



- *1000Minds* method:
  - ▣ Objective and fair
  - ▣ Farmer input
  - ▣ Informative
  - ▣ Develop breeding goals which align to the opinions of scientists **and** farmers