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The Economics of Farm Animal Welfare and Consumer Choice – Evidence from Australia

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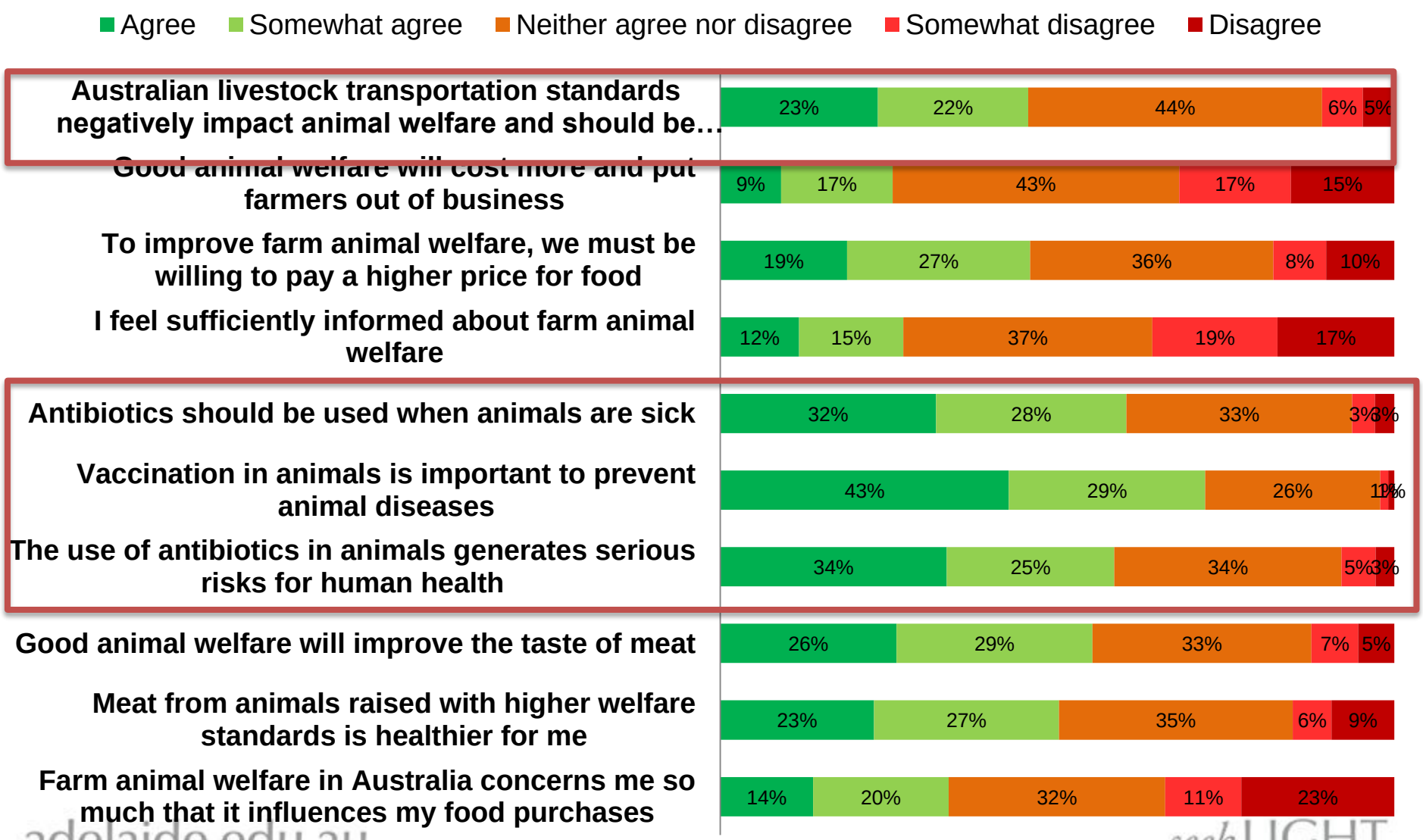
Background

- Public concerns over the welfare of farm animals have intensified globally
  - 2011 suspension of live cattle exports to Indonesia
  - cases of unethical treatment of farm animals
- Renewed societal interest in where our food comes from and how it is produced
- Need to quantify the extent of farm animal welfare concerns and value in the Australian consumer market

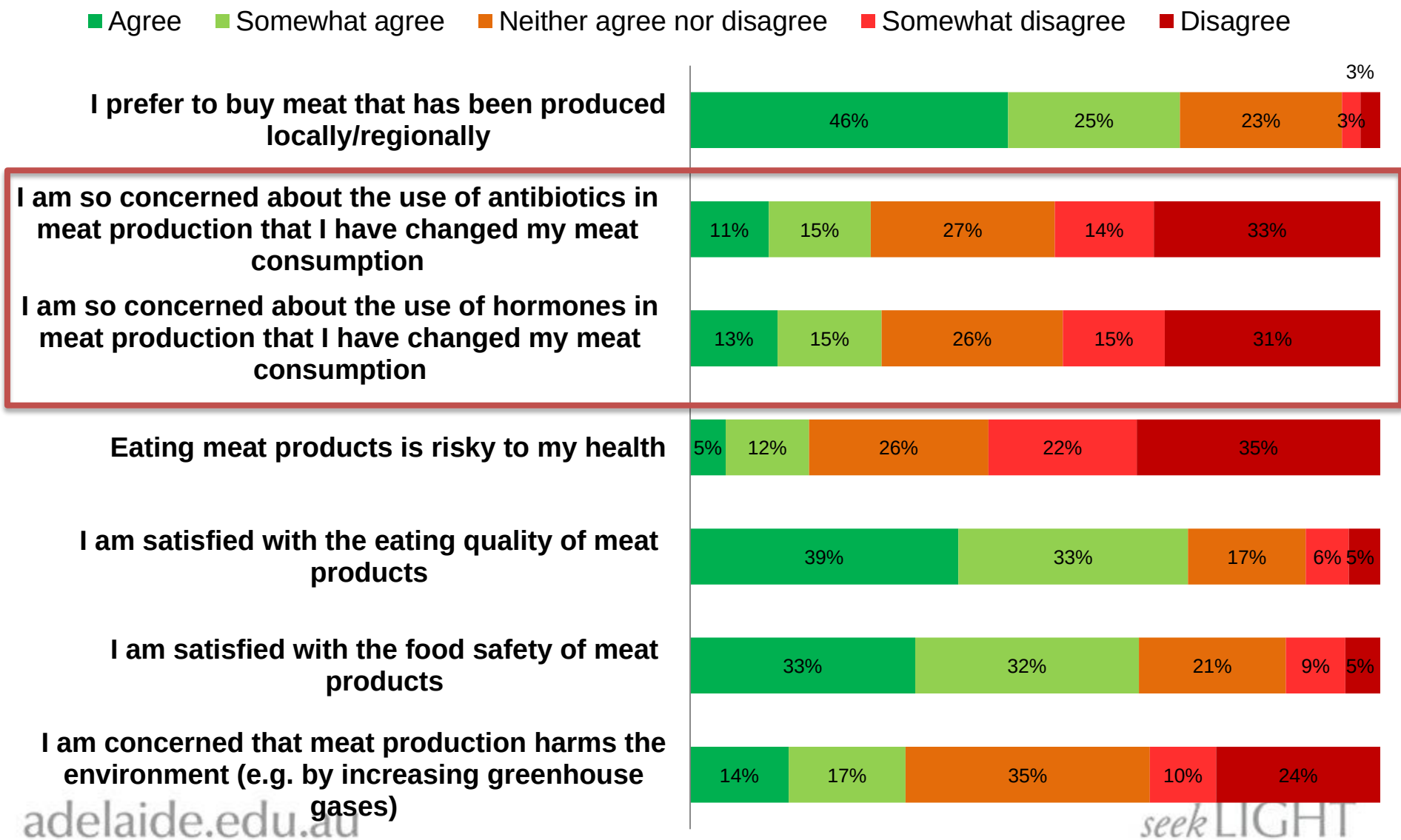
Study sample and data collection

- Nationally representative sample of 1009 Australian meat buyers
  - Surveyed Oct-Nov 2015
  - Recruited using online panel provider (Powerstats)
- Roy Morgan meat buyer data was used to set sample quotas for:
  - Age
  - Gender
  - Location (spread across states & city vs. country areas)
- Final sample matched Roy Morgan sample on above factors + education level, respondent income and employment.

Consumer attitudes about welfare issues



Consumer concerns



DCE Research Questions

1. Are there significant preferences for credence claims across meat types?
2. How does willingness to pay (WTP) for farm animal welfare (FAW) compare to the value placed on other credence attributes?
3. Do preferences for the credence claims differ across meat types?
4. Are preferences influenced by consumption frequency?
5. Are preferences influenced by socio-demographic variables?

DCE Elicitation Method

- DCE "Part 4" of Survey
- Bayesian D-efficient experimental design generated 24 choice sets per meat type – divided into 6 blocks of 4 choice sets
- Respondents randomly allocated to one of the four meat types (based on consumption frequency)
  - Completed 4 choice sets in total
  - Asked to select *most likely choice* out of 4 meat options and a 'no-choice' option

Choice scenario:

Imagine you are shopping for fresh LAMB to be prepared and consumed at home for a typical main meal.

Please consider the following 4 options which vary only by the factors shown in the table.

Select the option that you would be most likely to choose.

Meat cuts

Beef		Chicken		Pork		Lamb	
Mince	Your Preferred Beef Steak (Scotch or Porterhouse)	Breast Fillets	Thigh Fillets	Leg Roast	Loin Chops	Leg Roast	Loin Chops

Meat Attributes & Levels

Production method	Farm Animal welfare status	Organic status	Other claims	Other claims	Cost per kg
Beef & Lamb: Pasture-raised *Chicken & Pork:* Free Range	Certified Humane	Certified Organic	Antibiotic Free	No Added Hormones	4 levels per meat cut
Conventional	None (blank space)	None (blank space)	None (blank space)	None (blank space)	

Credence claims

	Option A	Option B	Option C	Option D	Option E
Cut	Lamb Leg Roast	Lamb Loin Chops	Lamb Leg Roast	Lamb Loin Chops	**I would not purchase any of these products**
Price	$7.99/kg	$23.99/kg	$9.59/kg	$17.99/kg	
Production Method	Pasture-raised	Pasture-raised	Conventional	Conventional	
Organic Status		Certified Organic	Certified Organic		
Farm Animal Welfare Status	Certified Humane		Certified Humane		
Other Claims	Antibiotic Free				
Other Claims	No Added Hormones			No Added Hormones	
I would choose	○	○	○	○	○

Overview of DCE Analysis

- Error Component Logit (ECL) models estimated for total sample and for each meat separately
  - ECL model is a variant of the mixed logit model
  - Accounts for panel nature of data and unobserved heterogeneity between respondents across the different attributes and alternatives (meat cuts)

- Marginal willingness-to-pay (WTP) estimates calculated using mean parameter coefficients
  - 95% confidence intervals estimated using Krinsky and Robb (1986) procedure
  - Statistically significant differences between WTP estimates identified using Poe et al. (2005) procedure

Q1. Are there significant preferences for credence claims across meat types?

	Coefficient	St error
Randomised variables		
Price	-0.307***	0.0150
Meat Cut	0.418***	0.1152
Production Method	0.490***	0.0482
Certified Organic	0.439***	0.0548
Certified Humane	0.525***	0.0525
Antibiotic Free	0.412***	0.0536
No Added Hormones	0.802***	0.0553
Distribution of randomised variables		
Price	0.530***	0.033
Meat Cut	2.623***	0.126
Production Method	0.425***	0.127
Certified Organic	0.704***	0.095
Certified Humane	0.378***	0.152
Antibiotic Free	0.472***	0.141
No Added Hormones	0.510***	0.122
Non randomised variables		
ASC	-13.200***	1.388
Chicken	3.753***	1.192
Pork	0.291	1.067
Lamb	1.248	1.080
SigmaE01	8.091***	0.801

Model statistics	
Observations (n)	4032 (1008)
Log Likelihood	-4572
Pseudo R-sqrd	0.295
AIC	2.277
Chi Sqrd	3834

Q2. Does WTP vary between farm animal welfare (FAW) and food safety attributes?

	WTP (95%CI)
Production Method	**$1.59** (1.17 - 2.10)
Certified Organic	**$1.43** (0.99 - 1.97)
Certified Humane	**$1.71** (1.25 - 2.26)
Antibiotic Free	**$1.34** (0.91 - 1.86)
No Added Hormones	**$2.61** (2.06 - 3.27)

WTP differences

- **No Added Hormones** > all other claims (P<0.01)
- **Certified Humane** > **Antibiotic Free** (P<0.01)
- **Production method** not significantly different to other claims
- **Certified Organic** not significantly different to other claims apart from **No Added Hormones**

Q3. Do preferences for the five credence claims differ across meat types?

Mean WTP (95% CI)

	Beef	Chicken	Pork	Lamb
Production method	$1.49 ($0.70 - $2.54)	**$1.45** ($0.88 - $2.28)	$1.12 ($0.32 - $2.40)	$0.80 ($0.22 - $1.70)
Organic	**$1.76** ($0.96 - $2.84)	$1.03 ($0.45 - $1.86)	$0.75 ($0.10 - $1.80)	$0.52 (-$0.13 - $1.51)
Humane	$1.53 ($0.68 - $2.66)	$0.98 ($0.44 - $1.77)	**$2.01** ($1.03 - $3.58)	$1.09 ($0.39 - $2.16)
Antibiotic Free	**$1.49** ($0.68 - $2.57)	$0.99 ($0.44 - $1.79)	$1.35 ($0.54 - $2.64)	$0.52 (-$0.10 - $1.48)
No Added Hormones	$2.47 ($1.46 - $3.83)	$1.79 ($1.10 - $2.81)	$2.52 ($1.46 - $4.23)	$1.72 ($0.96 - $2.91)

WTP differences (P<0.05)

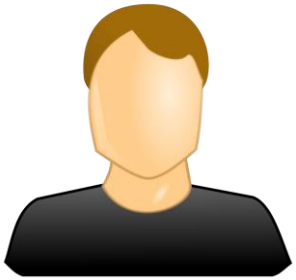
- Organic Beef > Organic Chicken, Pork or Lamb
- Free Range Chicken > Pasture Fed Lamb
- Humane Pork > Humane Chicken
- Antibiotic Free Beef > Antibiotic Free Lamb

Q5. Are preferences influenced by consumption frequency?

- Coding: 0 = cheaper cut, 1 = more expensive cut
- Consumption frequency categories:
  - Daily, At least once per week, Fortnightly, Monthly, < Once per month, Never
  - Converted to continuous variable for analysis
- **No significant interactions in full sample model or beef model**

	Chicken		Pork		Lamb	
Cut	0	1	0	1	0	1
	Breast	**Thigh**	**Roast**	**Chop**	**Roast**	**Chop**
Production method	-	+ve**	–ve*	–ve**	-	-
Certified Organic	-	-	-	-	–ve**	–ve*
Certified Humane	-	-	-	-	–ve***	-
Antibiotic Free	-	-	-	-	-	-
No Added Hormones	-	-	-	-	-	-

Q6. Are preferences for the credence claims influenced by socio-demographic variables?



Certified Humane

Less likely to select than females

No Added Hormones

Less likely to select than younger respondents

Certified Organic

More likely to select than respondents with lower than average income

Higher than average income

Not significant (P>0.10)

Retired, university education, age < 30 and < 50, metropolitan or urban area, primary shopper

Summary

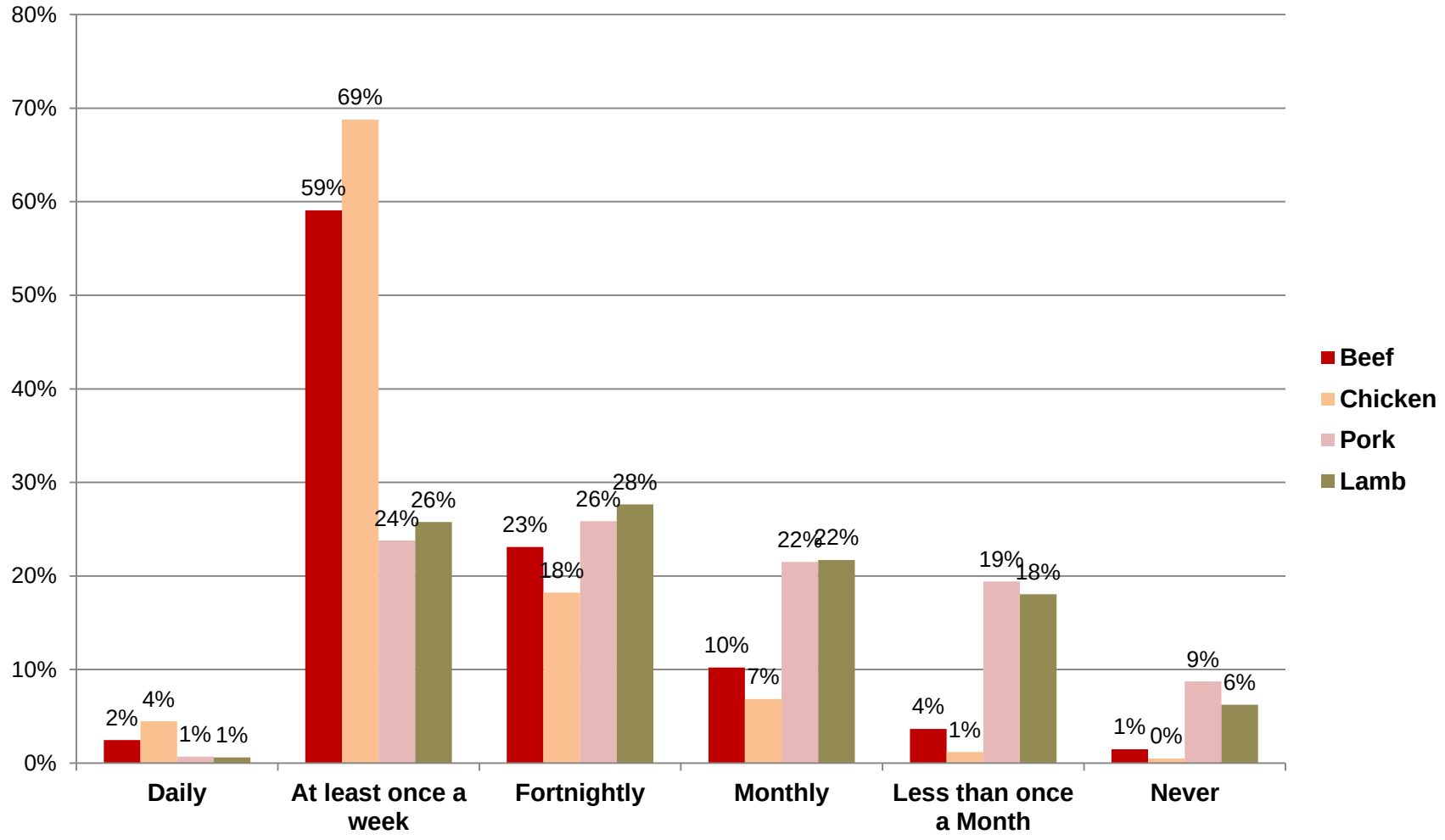
- Presence of credence claims has a positive impact on choice
- Highest value for “No Added Hormones”
- “Certified Humane” is valued more than “Antibiotic Free”
- Values for credence attributes vary across species of meat
- Further work needed to understand implications

Thank you!

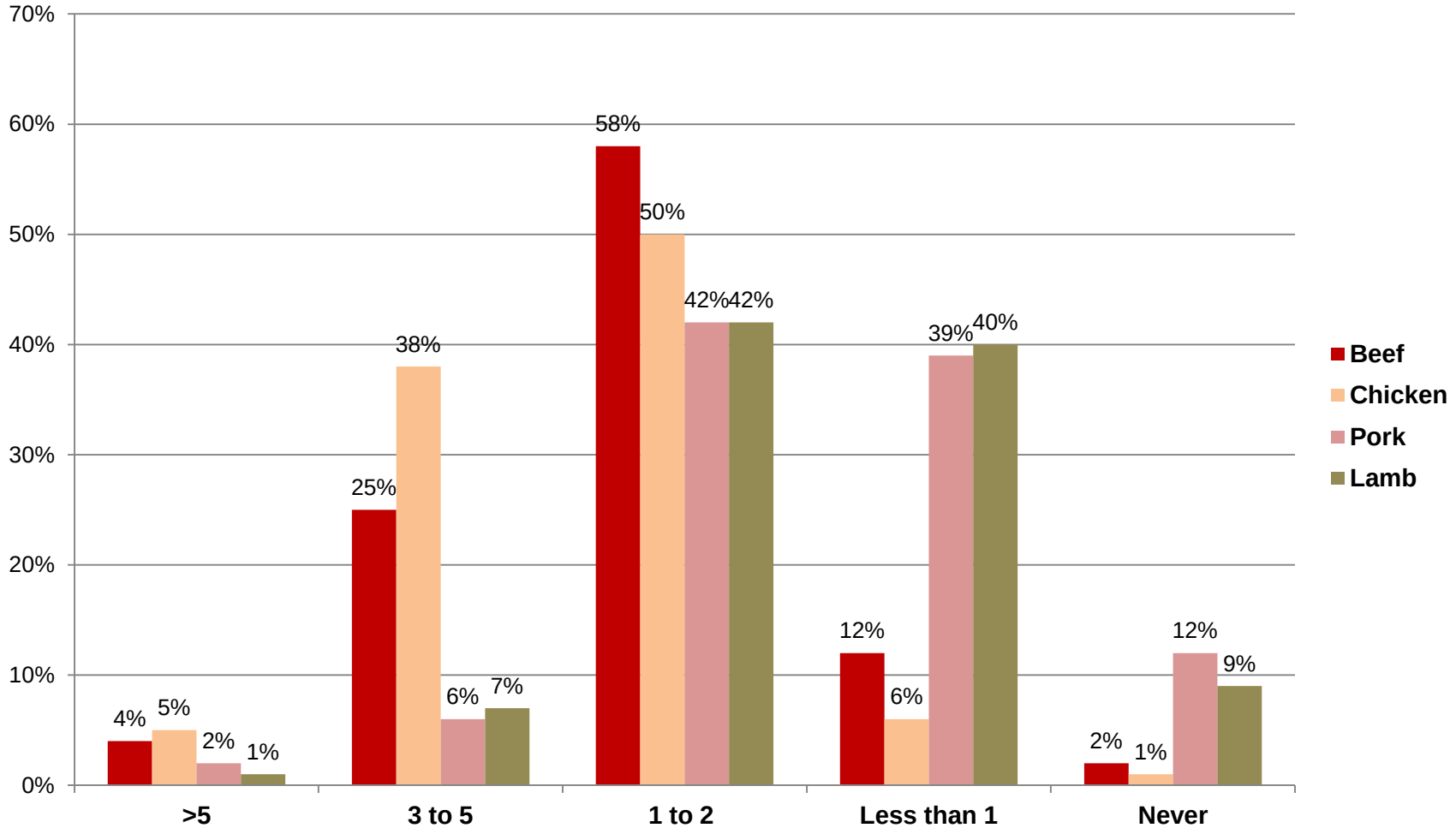
http://www.adelaide.edu.au/global-food

http://www.adelaide.edu.au/global-food/blog/wendy.umberger@adelaide.edu.au

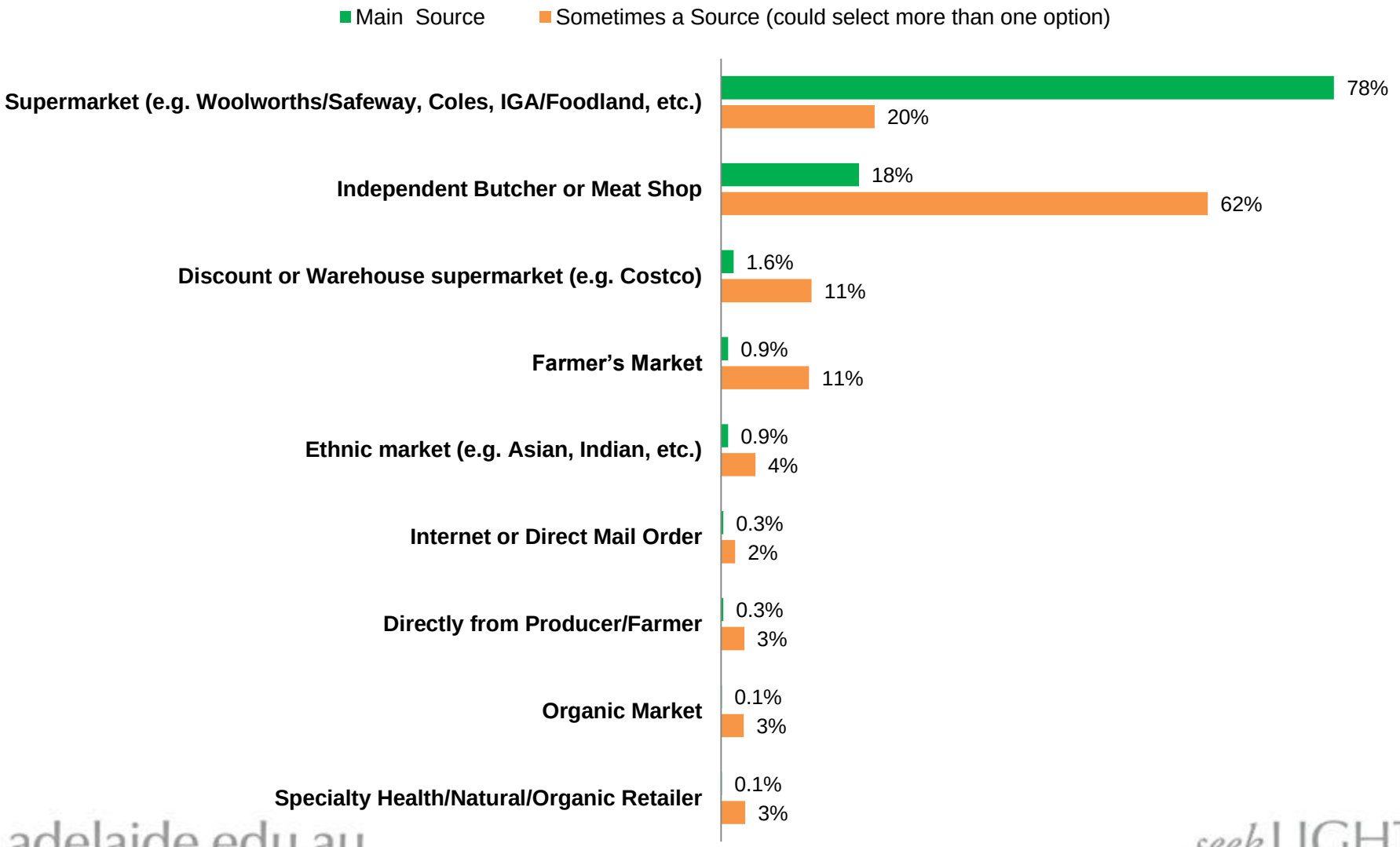
Frequency of meat **purchase**



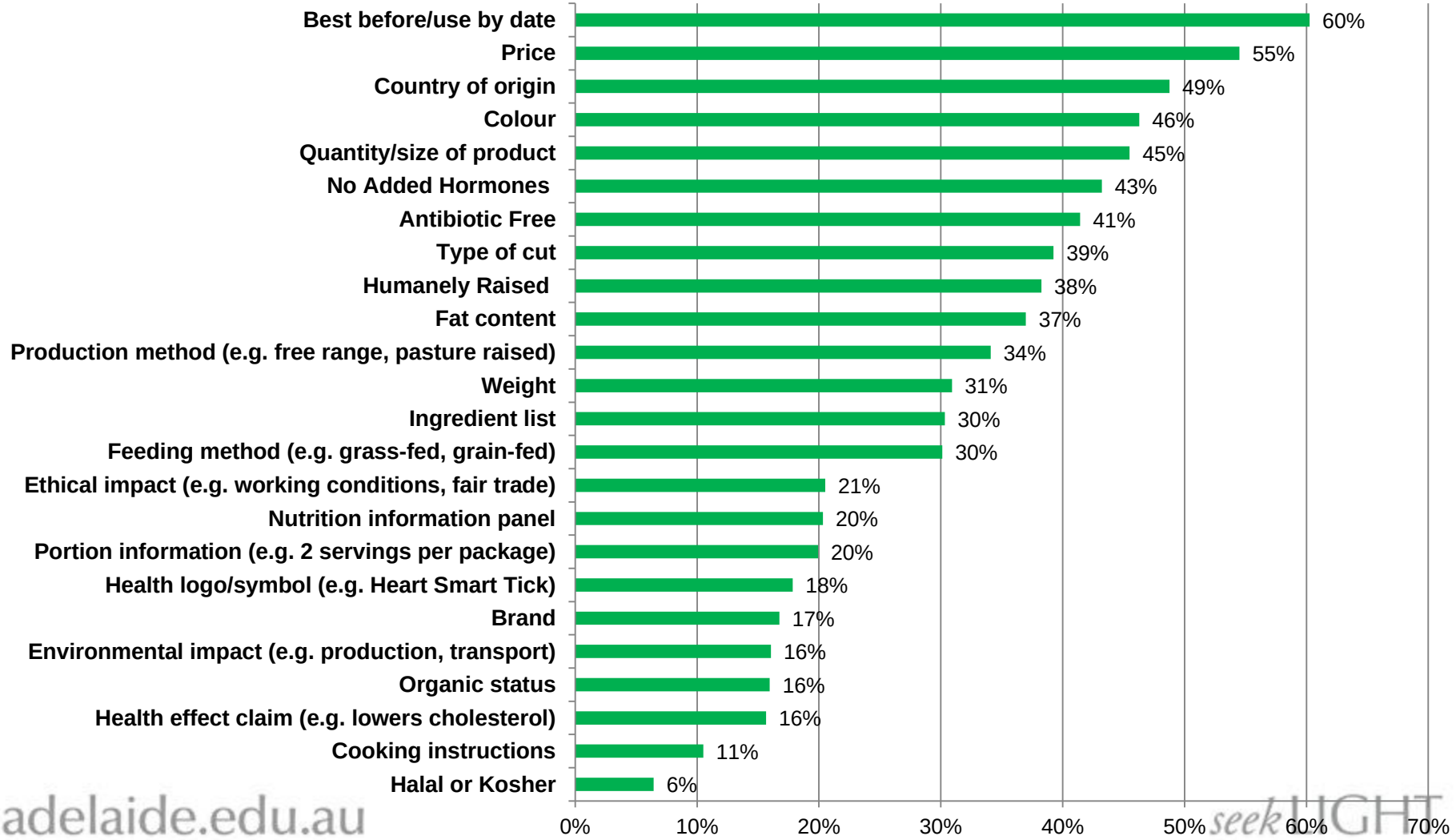
Frequency of at home meat **preparation/consumption**



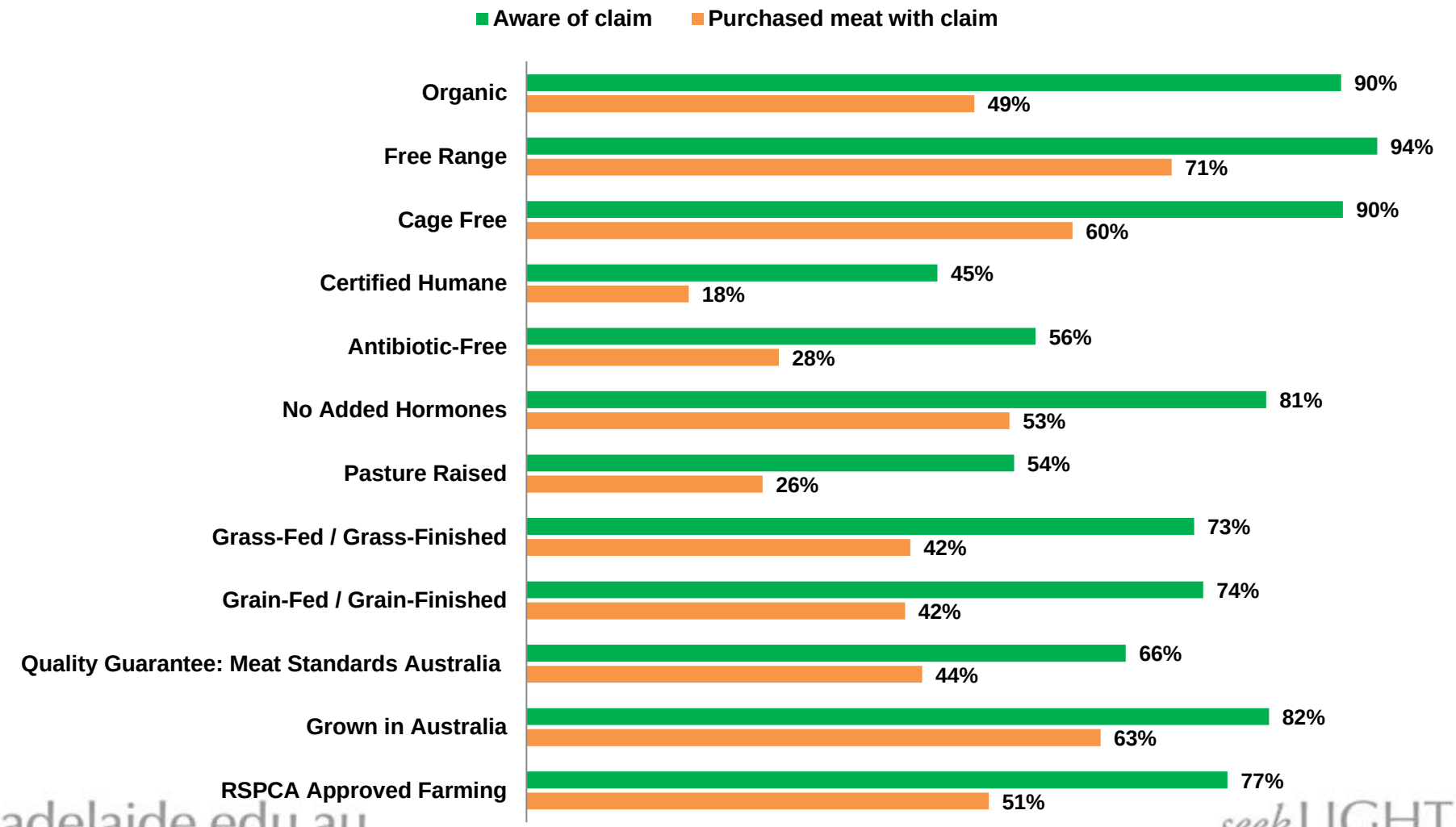
Meat purchase locations



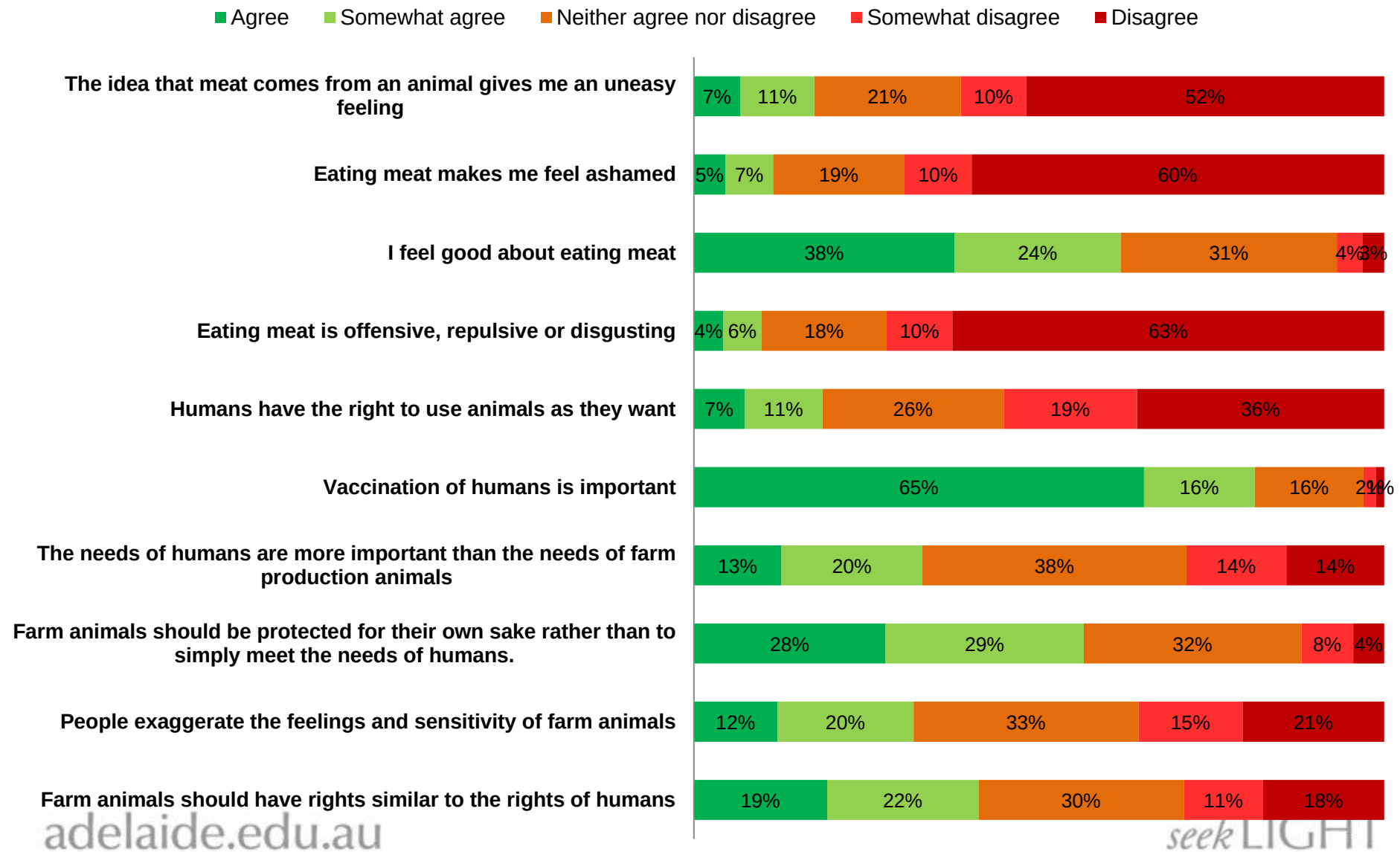
Meat labelling information considered very/extremely important



Previous awareness and purchase of meat with credence claims



Consumer attitudes (moral value based Qs)



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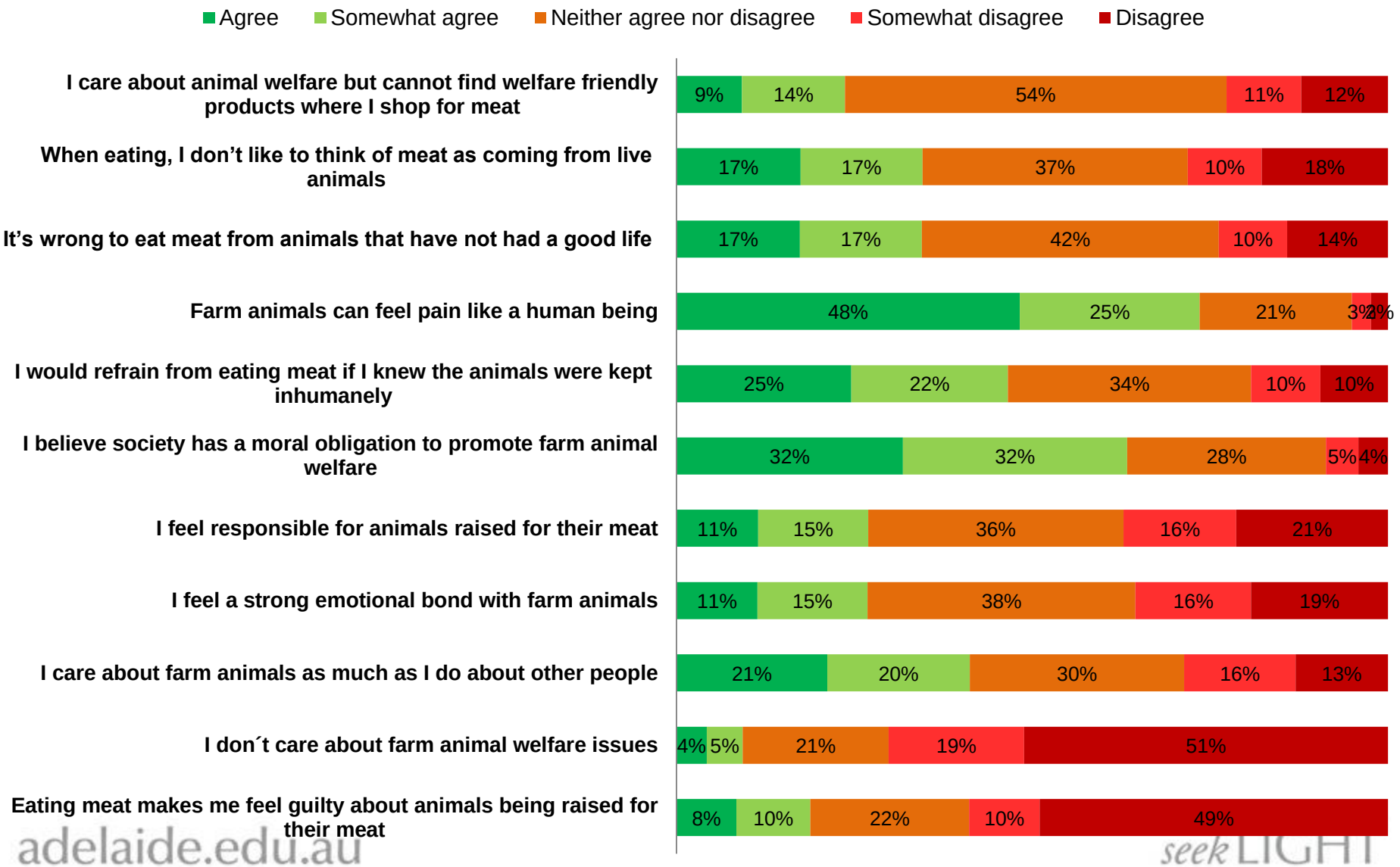
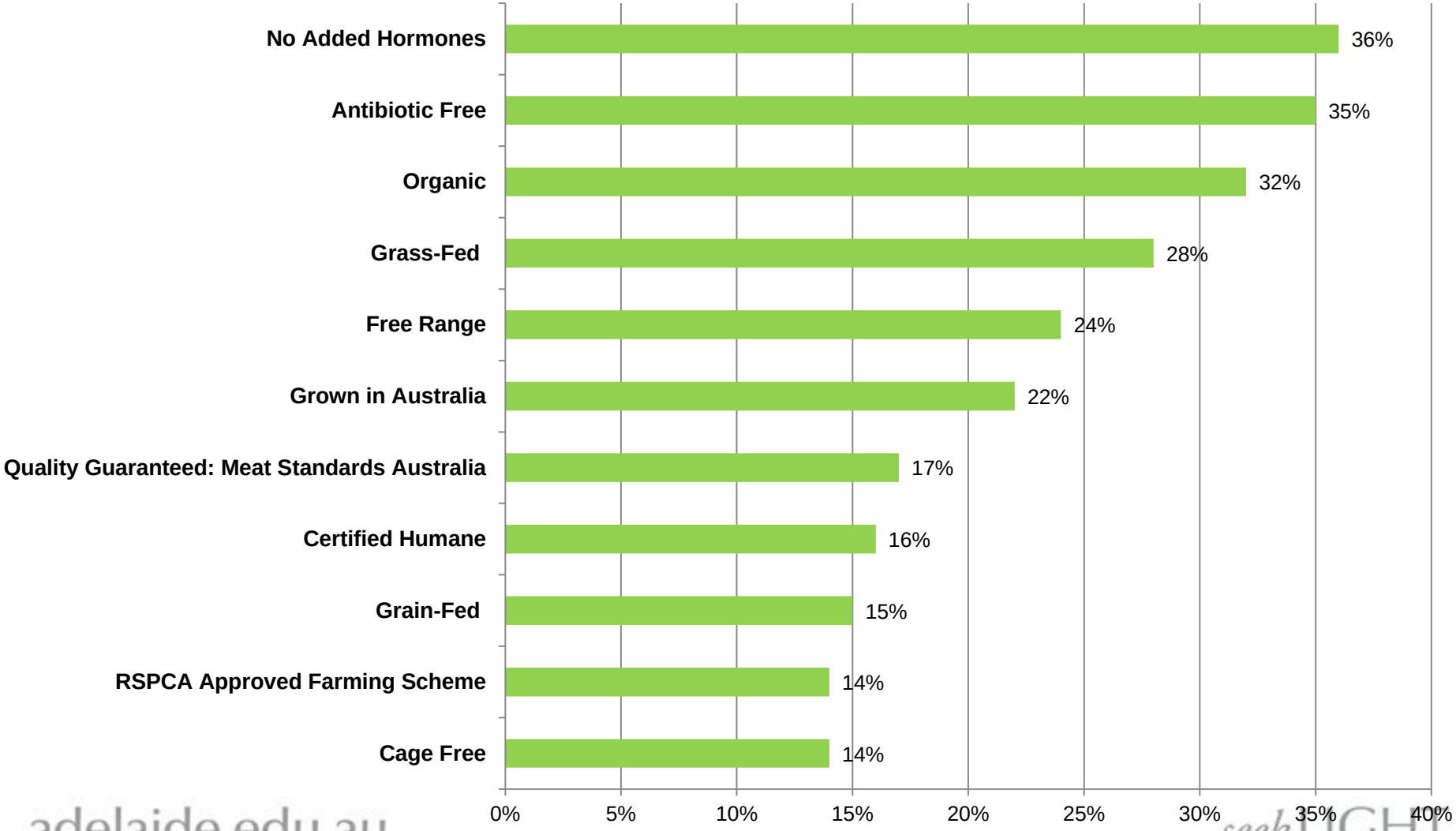
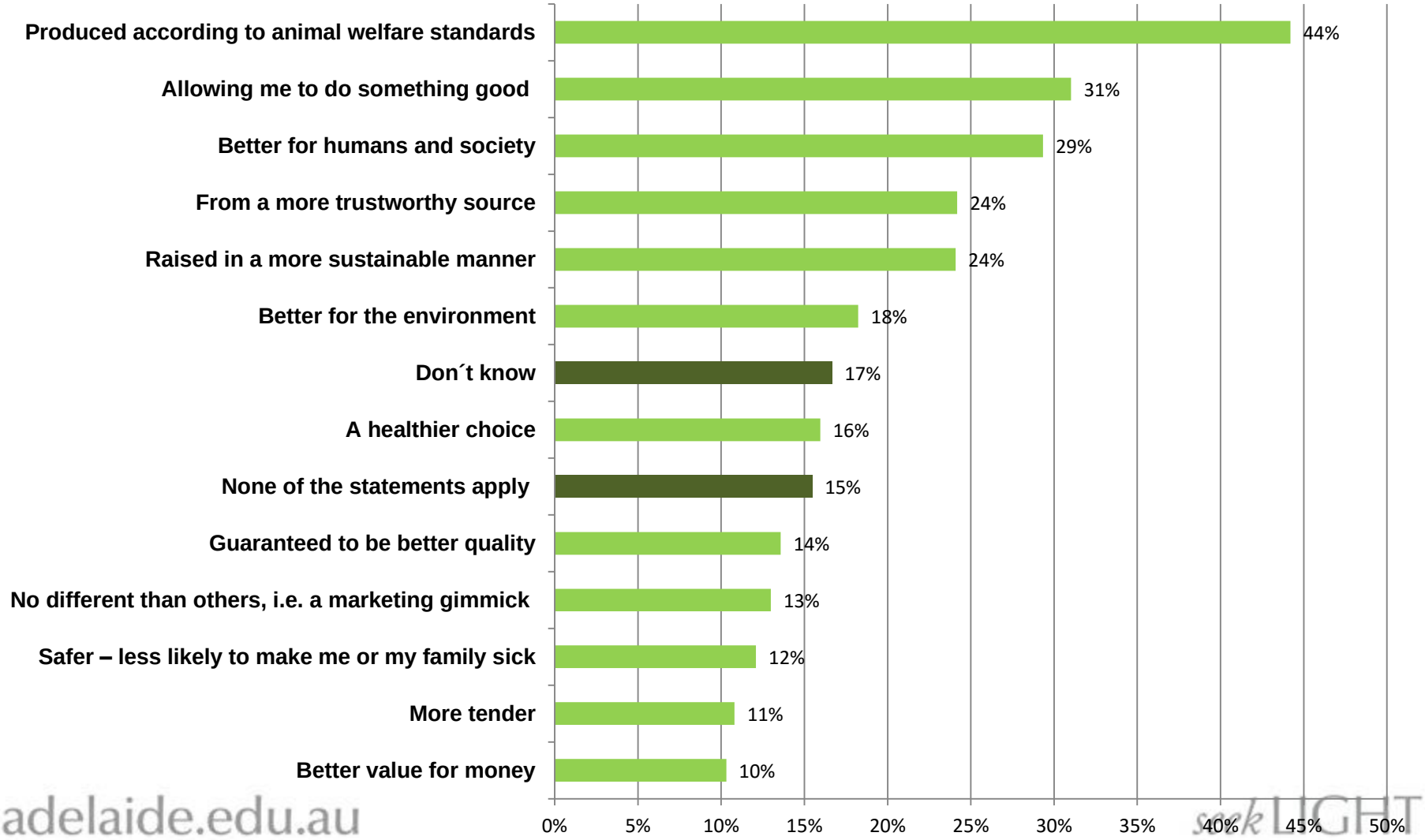


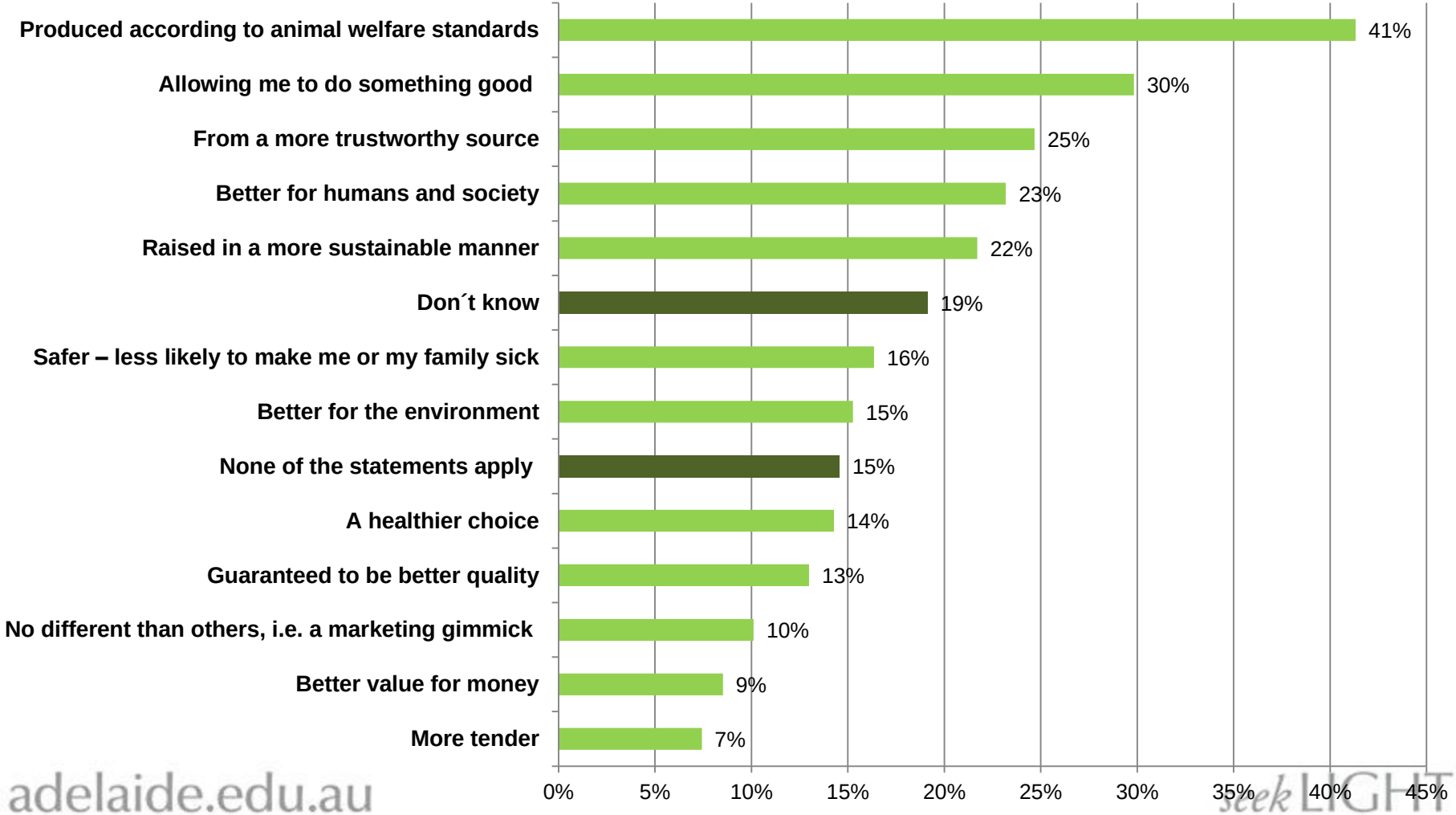
Believed to be ‘a healthier choice’



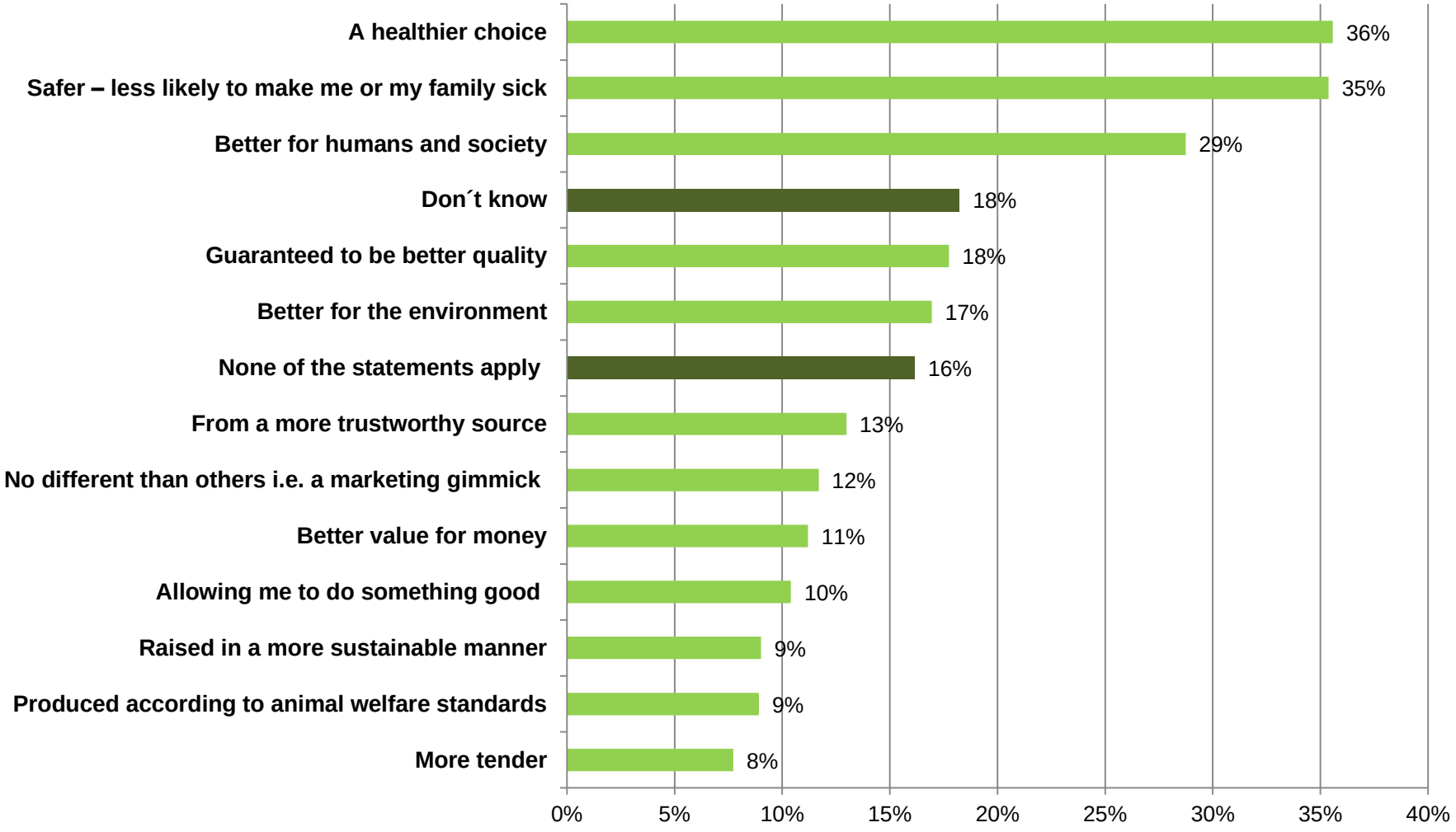
‘Certified Humane’ Perceptions



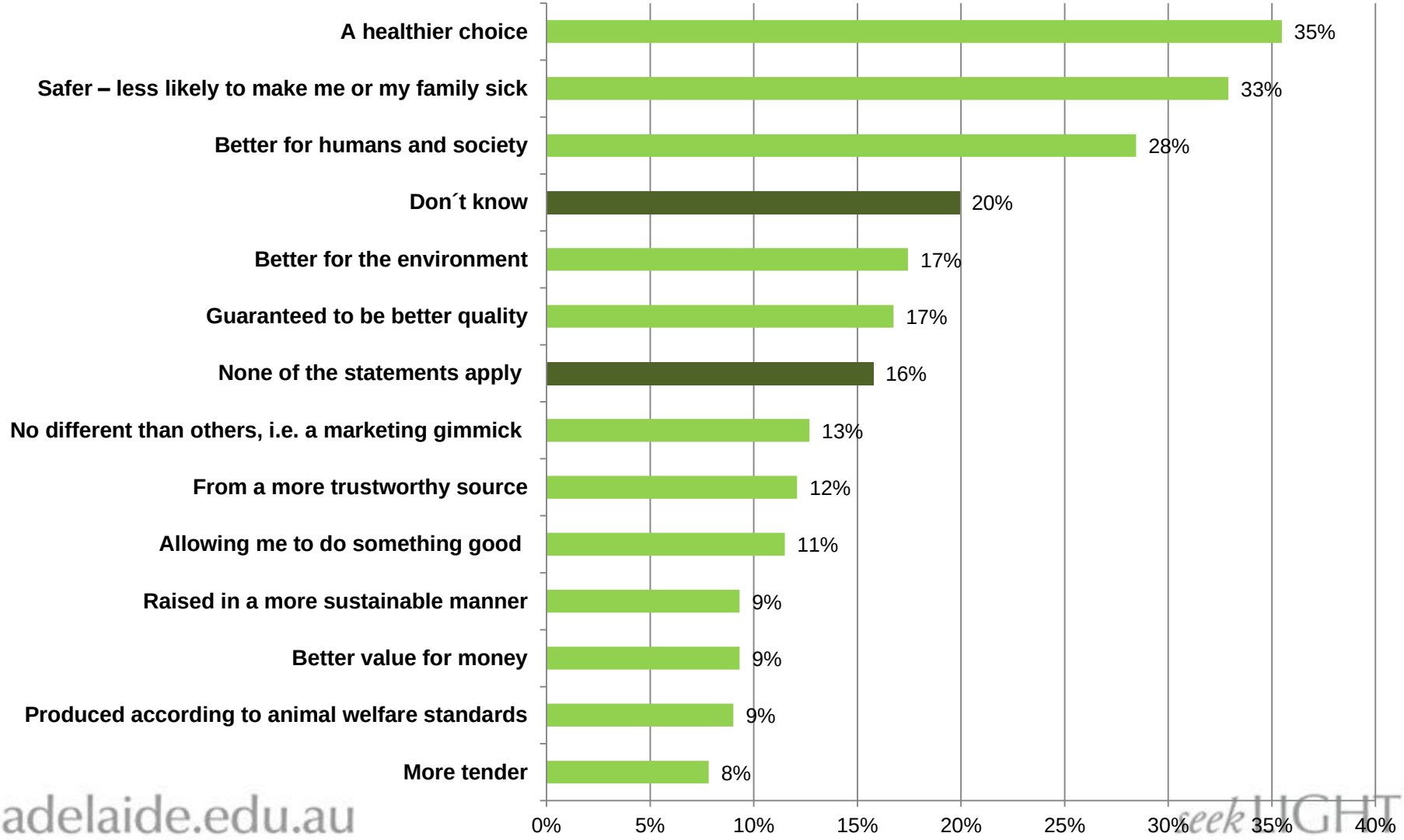
‘RSPCA Approved Farming Scheme’ Perceptions



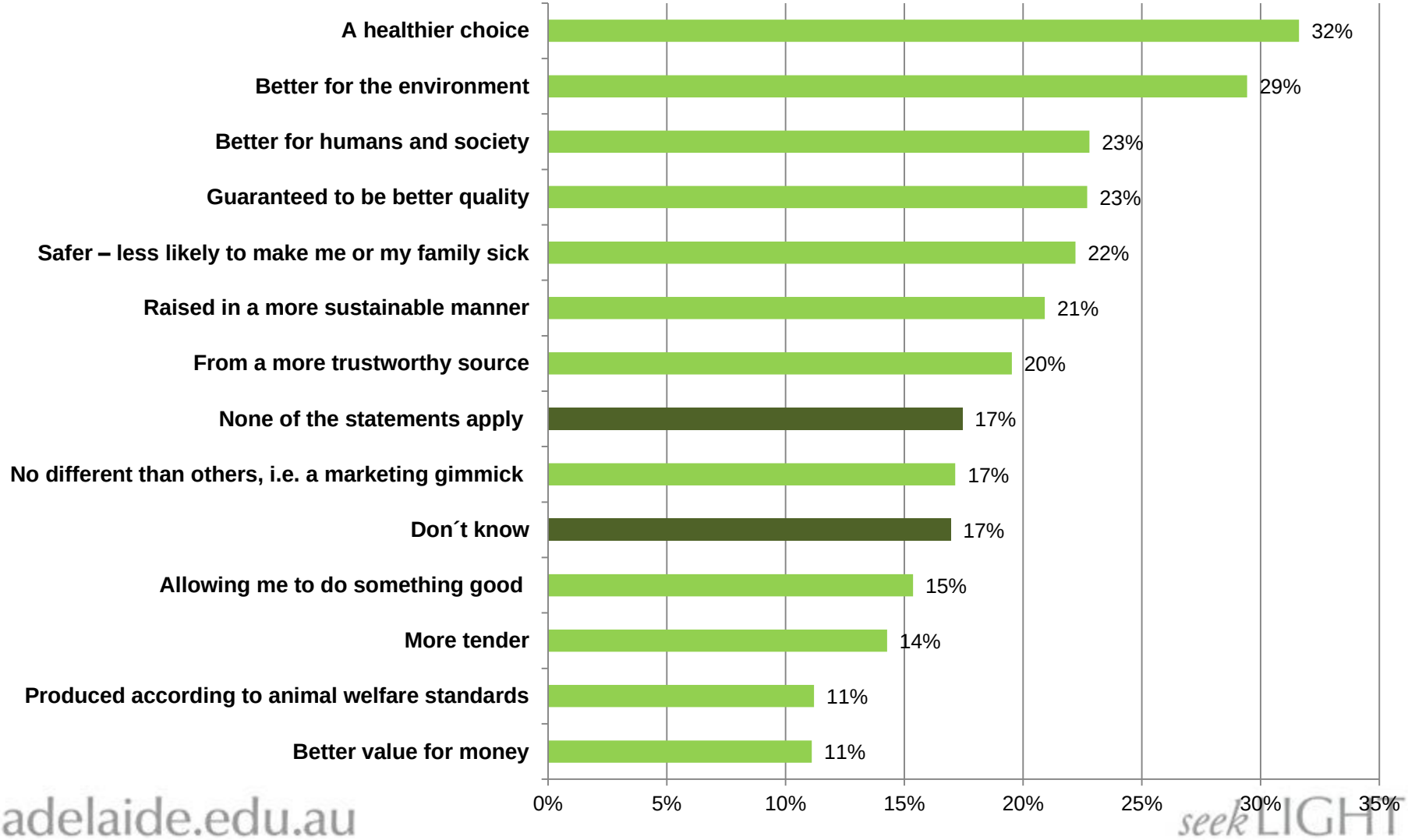
‘No Added Hormones’ Perceptions



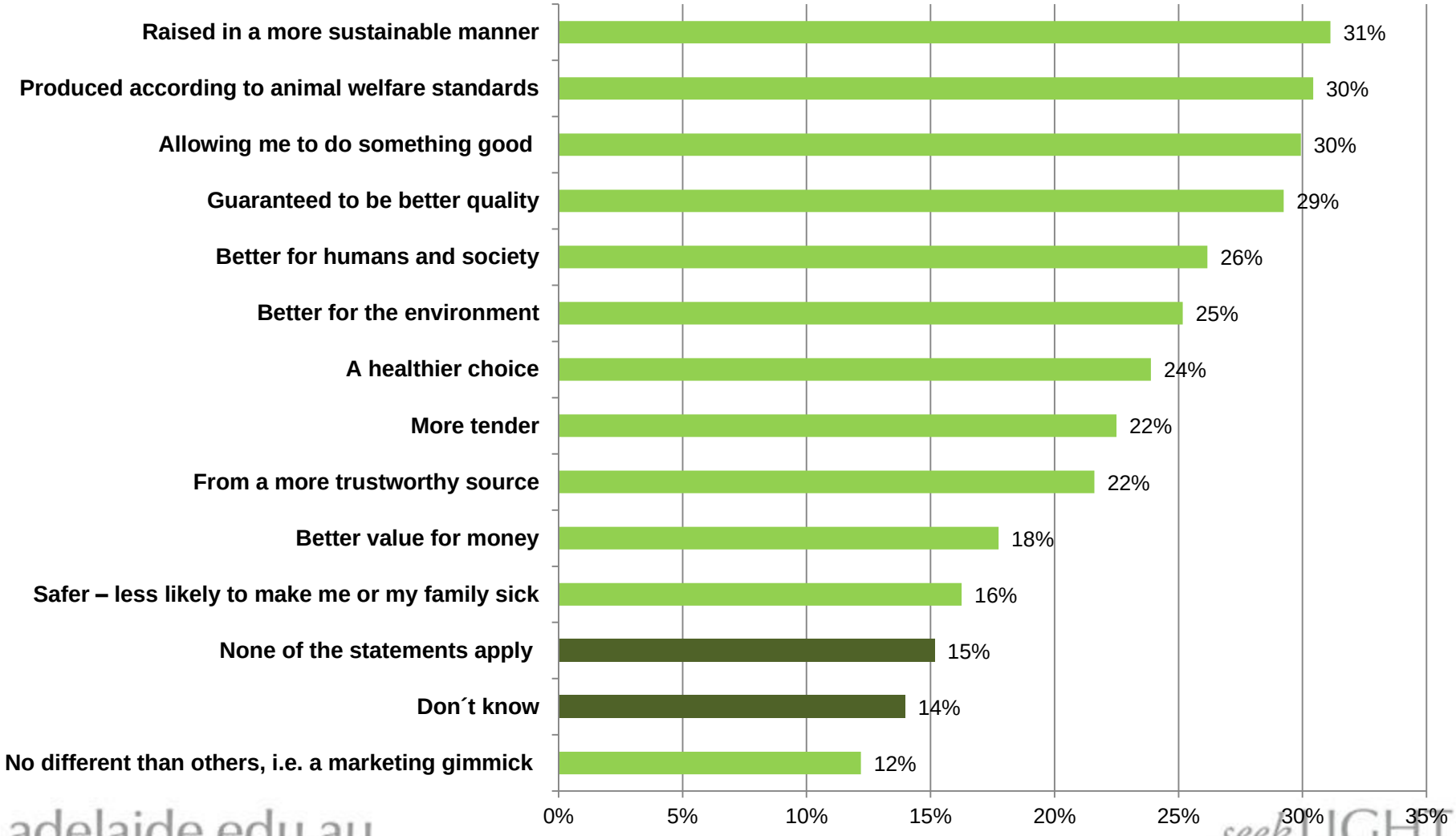
‘Antibiotic Free’ Perceptions



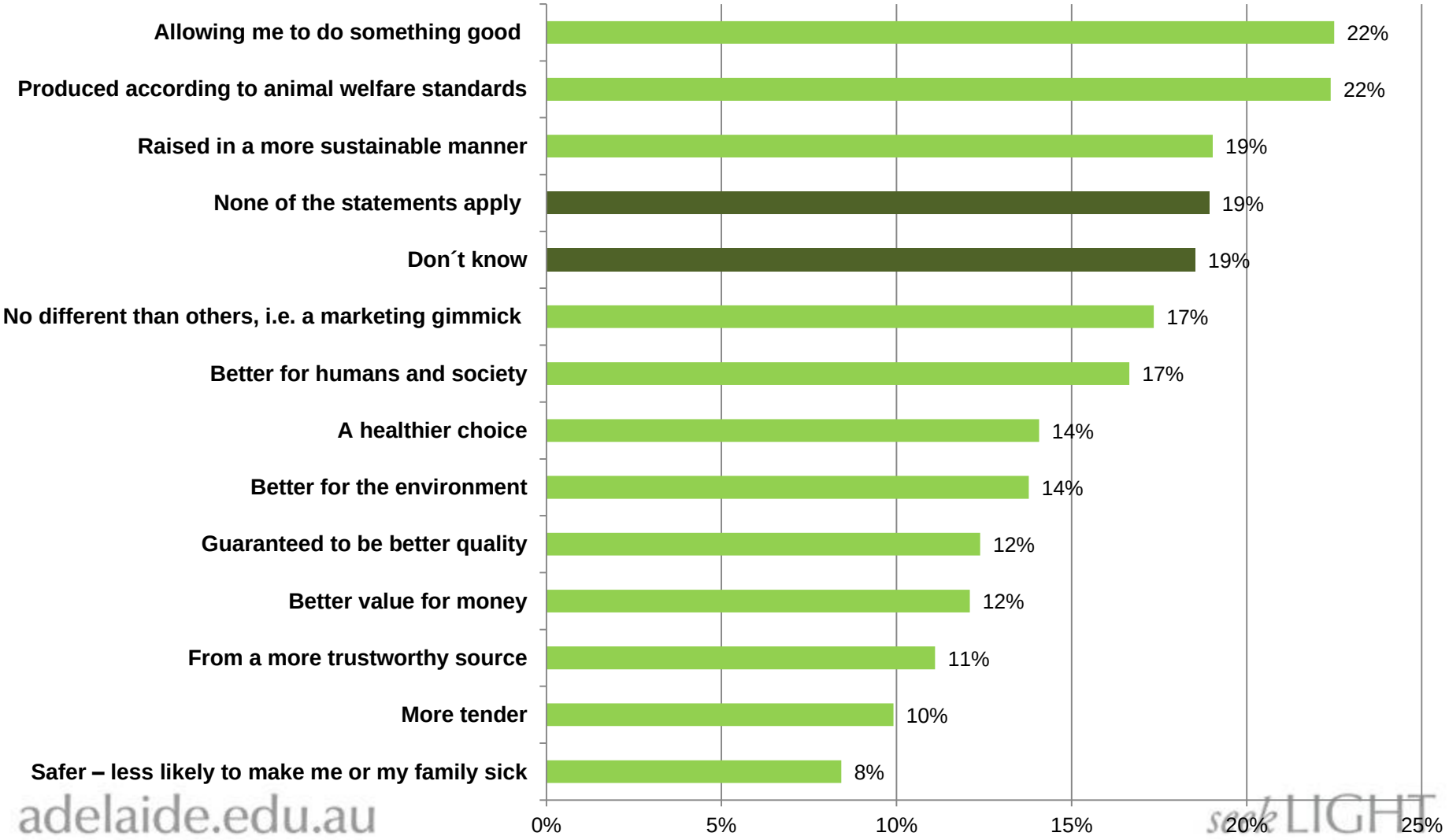
‘Organic’ Perceptions



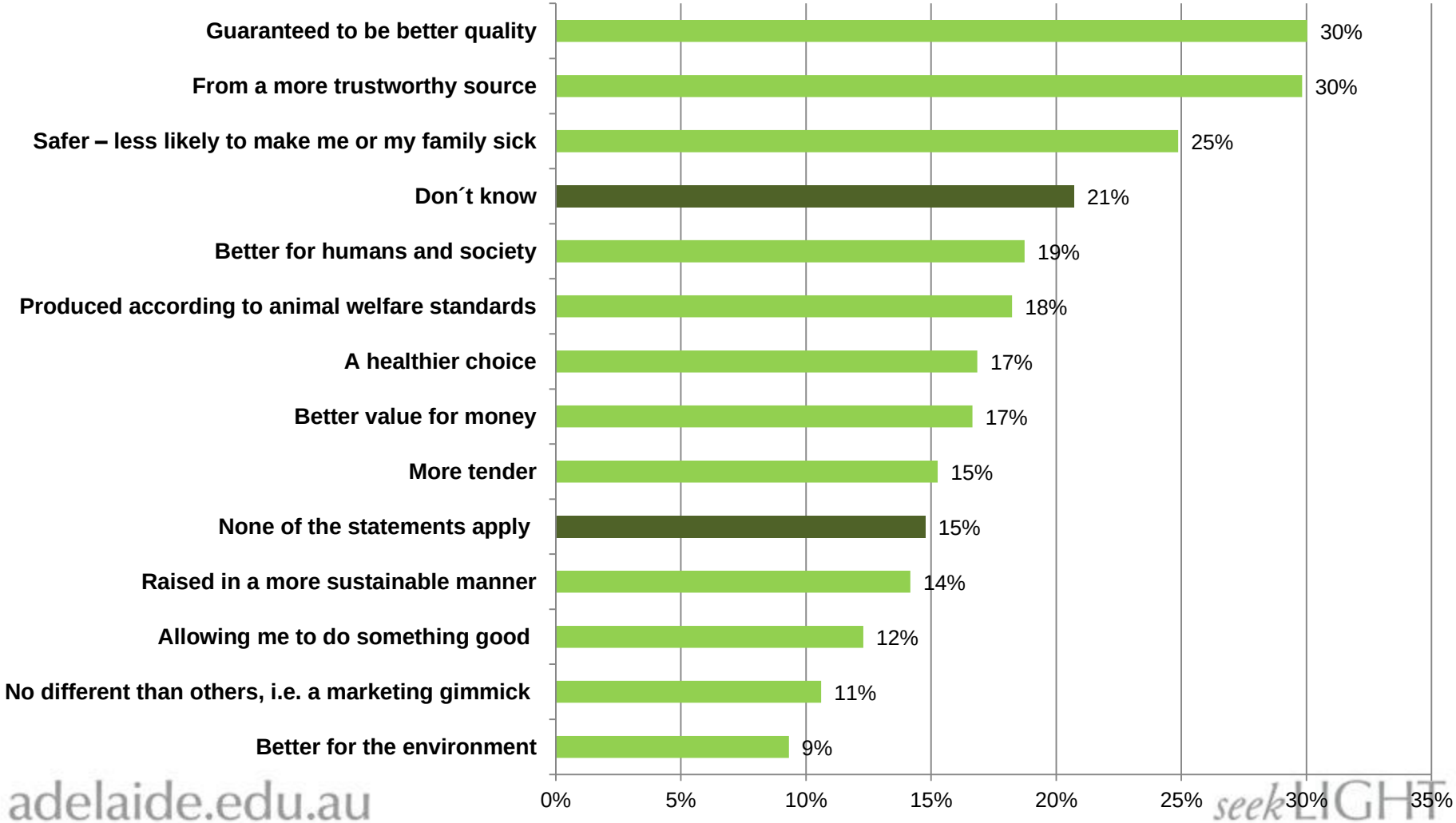
‘Free Range’ Perceptions



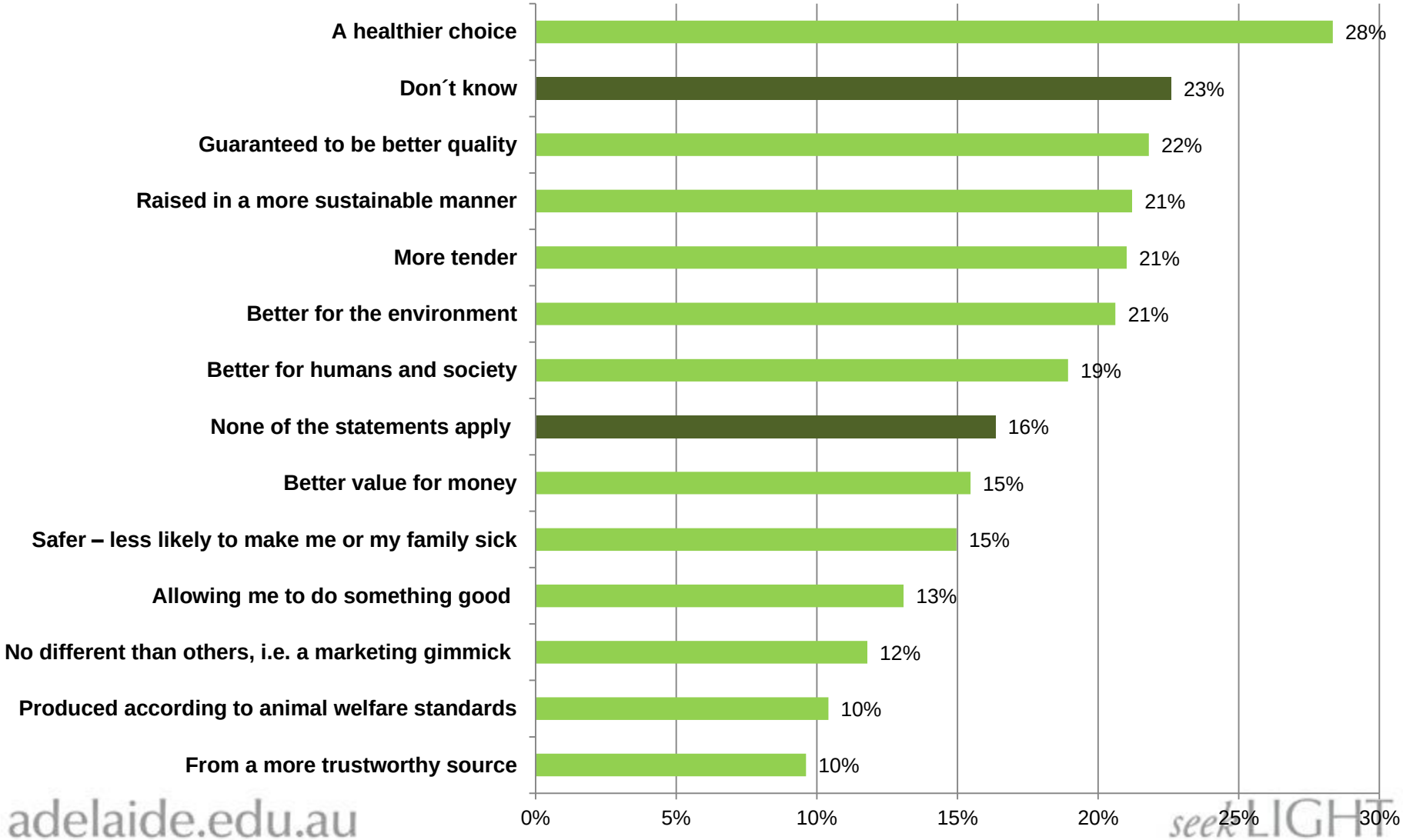
‘Cage Free’ Perceptions



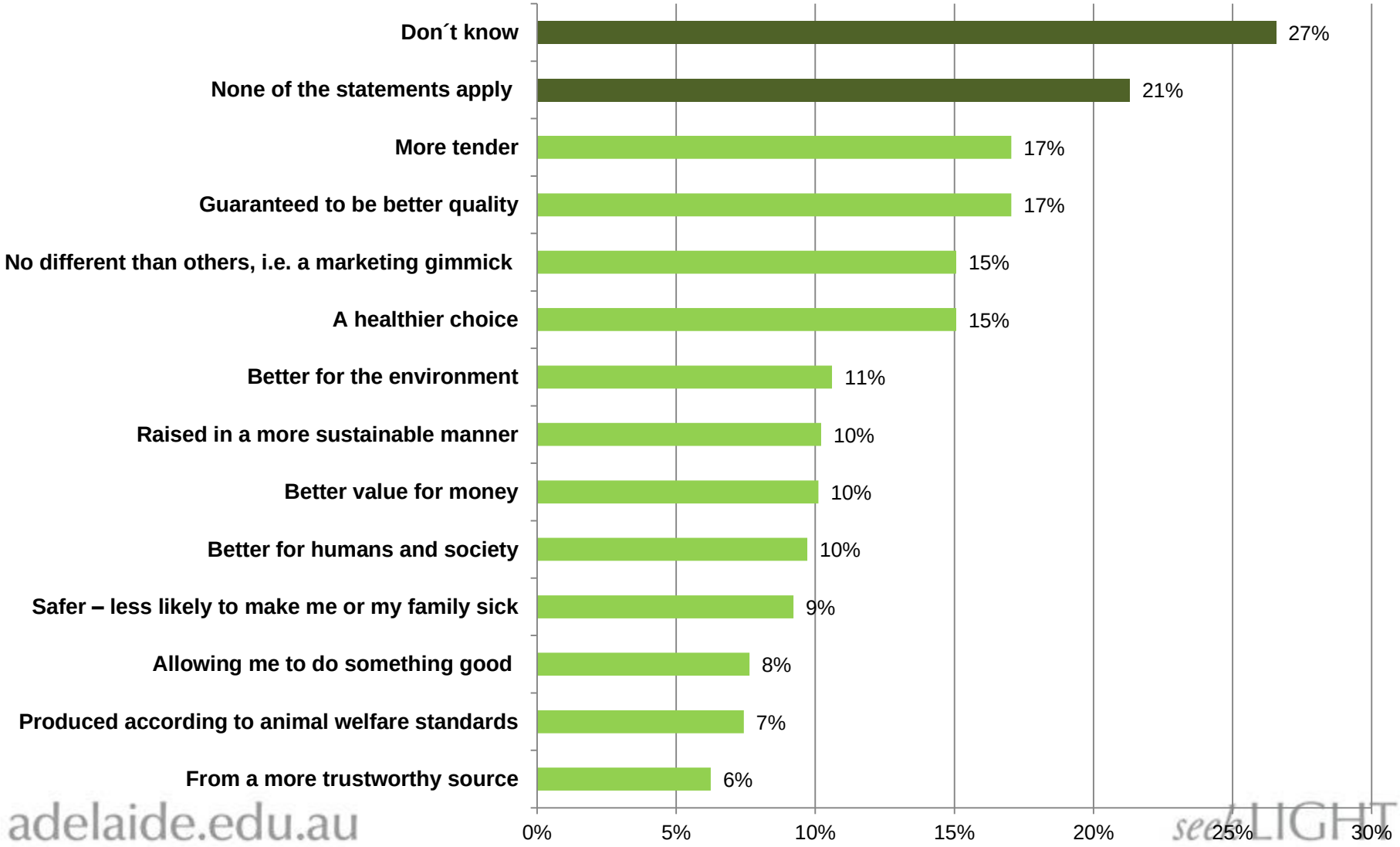
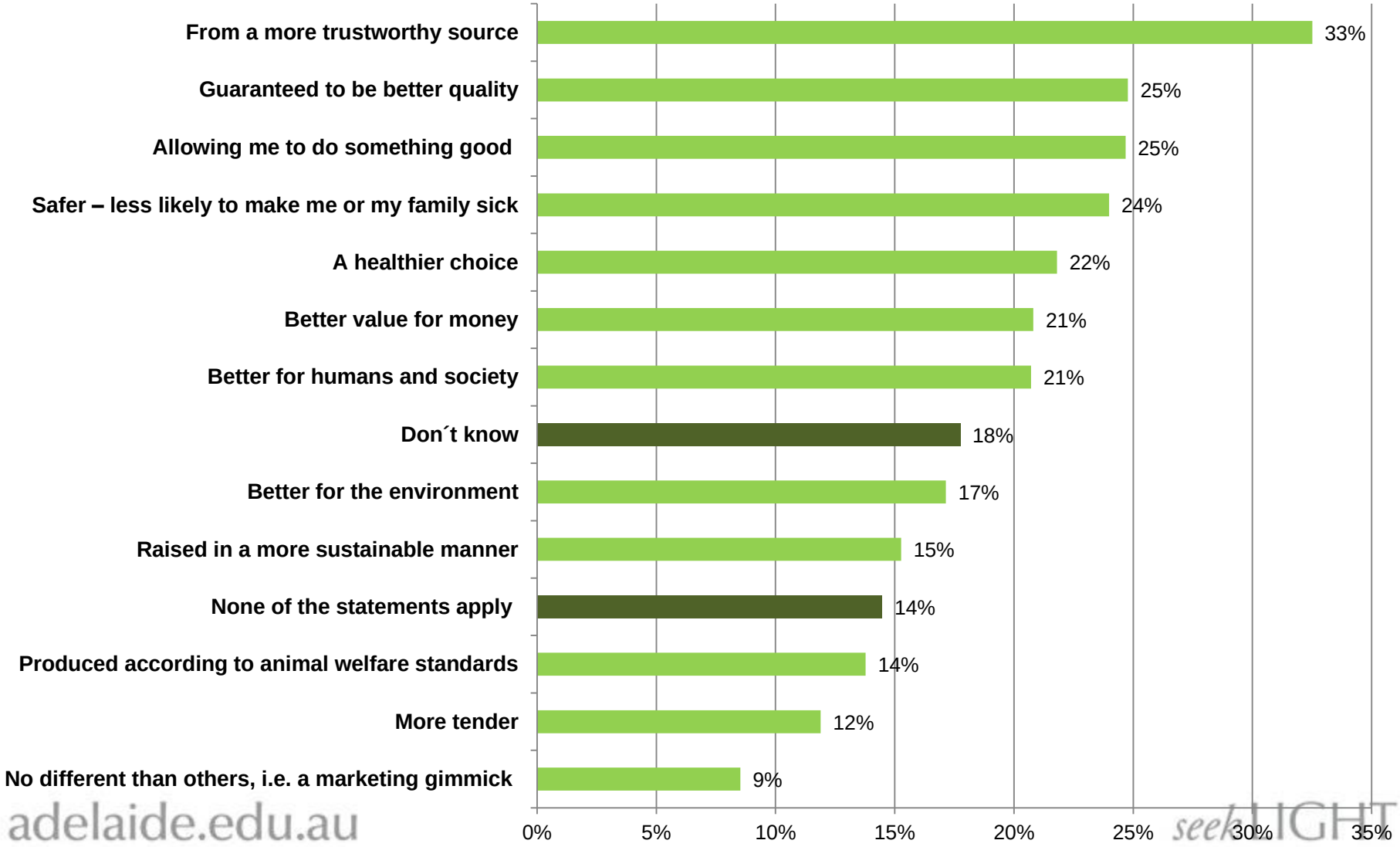
‘Quality Guaranteed: Meat Standards Australia’ Perceptions



‘Grass-Fed’ Perceptions



‘Grain-Fed’ Perceptions



‘Grown in Australia’ Perceptions