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

Wendy Umberger, Ph.D.

Director and Professor, Global Food Studies, University of Adelaide

Jill Windle and John Rolfe (UQ), Lenka Malek (Uni Adelaide), Sven Anders (Uni Alberta)

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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

■ Agree
 ■ Somewhat agree
 ■ Neither agree nor disagree
 ■ Somewhat disagree
 ■ Disagree

Australian livestock transportation standards negatively impact animal welfare and should be...

23% 22% 44% 6% 5%

Good animal welfare will cost more and put farmers out of business

9% 17% 43% 17% 15%

To improve farm animal welfare, we must be willing to pay a higher price for food

19% 27% 36% 8% 10%

I feel sufficiently informed about farm animal welfare

12% 15% 37% 19% 17%

Antibiotics should be used when animals are sick

32% 28% 33% 3% 3%

Vaccination in animals is important to prevent animal diseases

43% 29% 26% 1%

The use of antibiotics in animals generates serious risks for human health

34% 25% 34% 5% 3%

Good animal welfare will improve the taste of meat

26% 29% 33% 7% 5%

Meat from animals raised with higher welfare standards is healthier for me

23% 27% 35% 6% 9%

Farm animal welfare in Australia concerns me so much that it influences my food purchases

14% 20% 32% 11% 23%

Consumer concerns

■ Agree
 ■ Somewhat agree
 ■ Neither agree nor disagree
 ■ Somewhat disagree
 ■ Disagree

I prefer to buy meat that has been produced locally/regionally



I am so concerned about the use of antibiotics in meat production that I have changed my meat consumption



I am so concerned about the use of hormones in meat production that I have changed my meat consumption



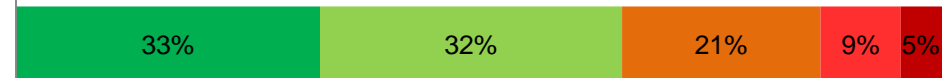
Eating meat products is risky to my health



I am satisfied with the eating quality of meat products



I am satisfied with the food safety of meat products



I am concerned that meat production harms the environment (e.g. by increasing greenhouse gases)



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
<i>Beef & Lamb:</i> Pasture-raised <i>Chicken & Pork:</i> 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	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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	Model statistics	
Randomised variables			Observations (n)	4032 (1008)
Price	-0.307***	0.0150	Log Likelihood	-4572
Meat Cut	0.418***	0.1152	Pseudo R-sqrd	0.295
Production Method	0.490***	0.0482	AIC	2.277
Certified Organic	0.439***	0.0548	Chi Sqrd	3834
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		

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)

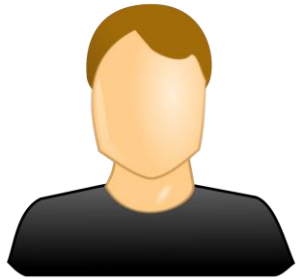
- Organic Beef > Organic Chicken, Pork or Lamb
- Humane Pork > Humane Chicken
- Free Range Chicken > Pasture Fed Lamb
- Antibiotic Free Beef > Antibiotic Free Lamb

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

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

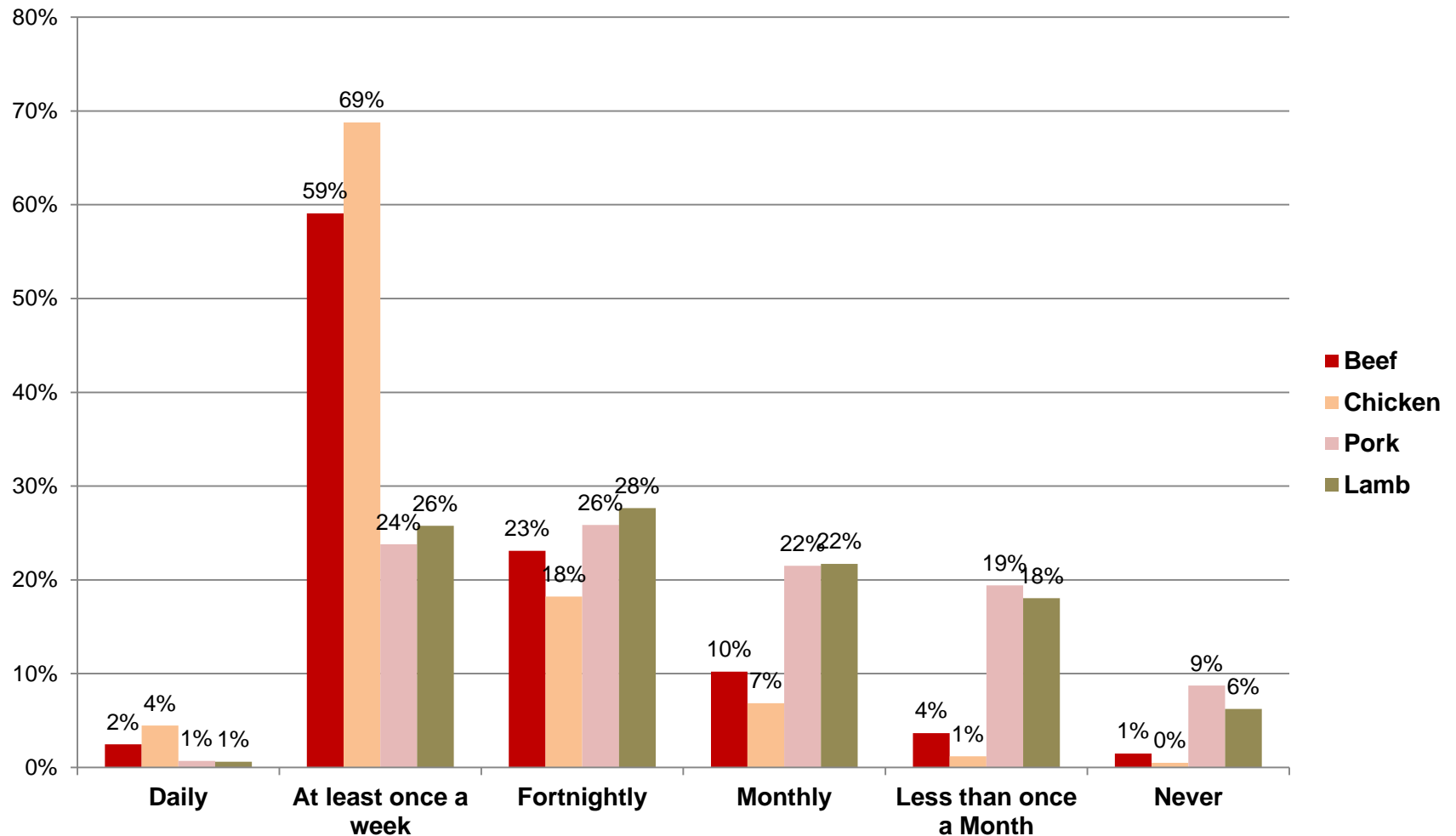


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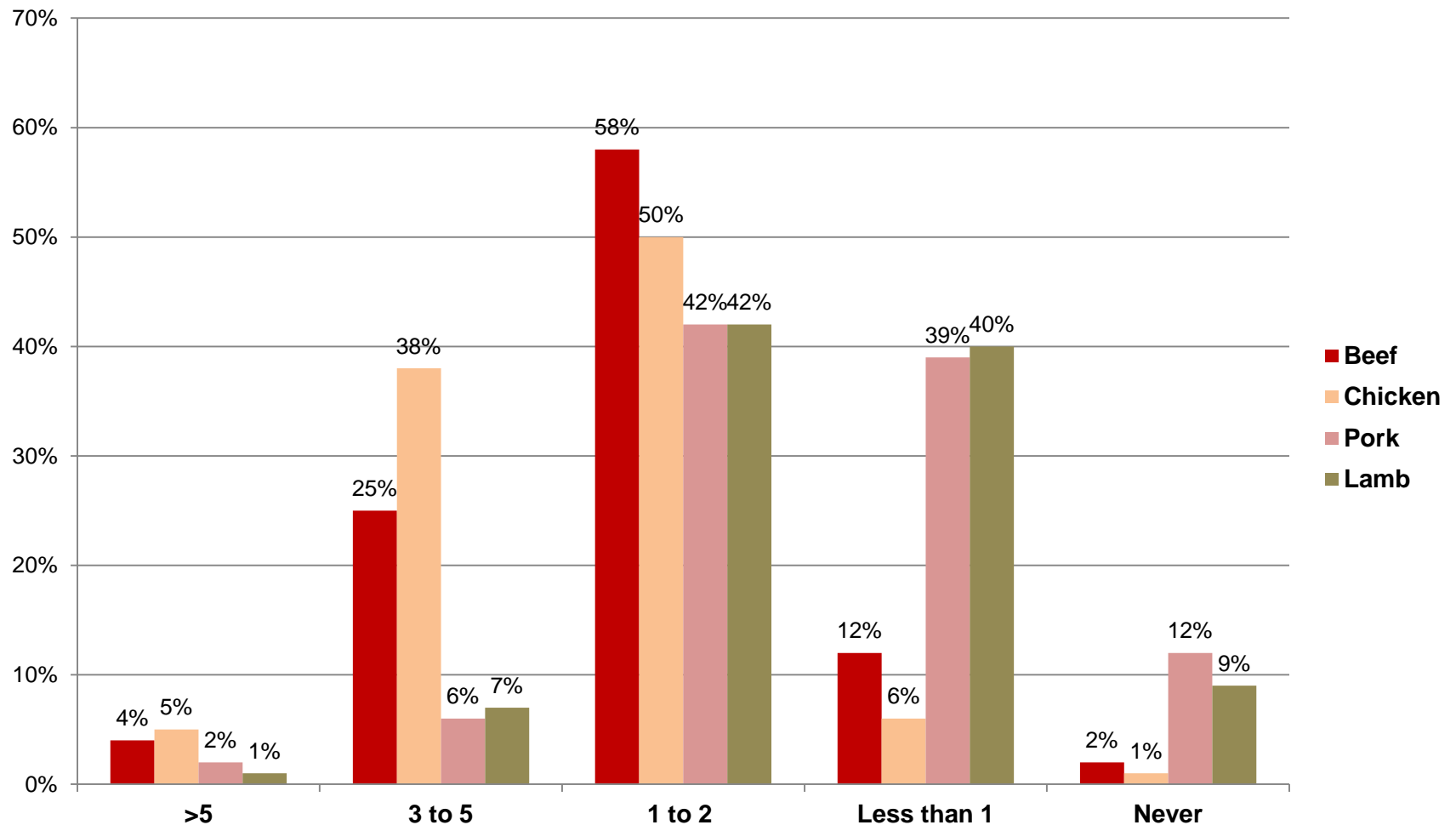
<http://www.adelaide.edu.au/global-food>

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

Frequency of meat purchase

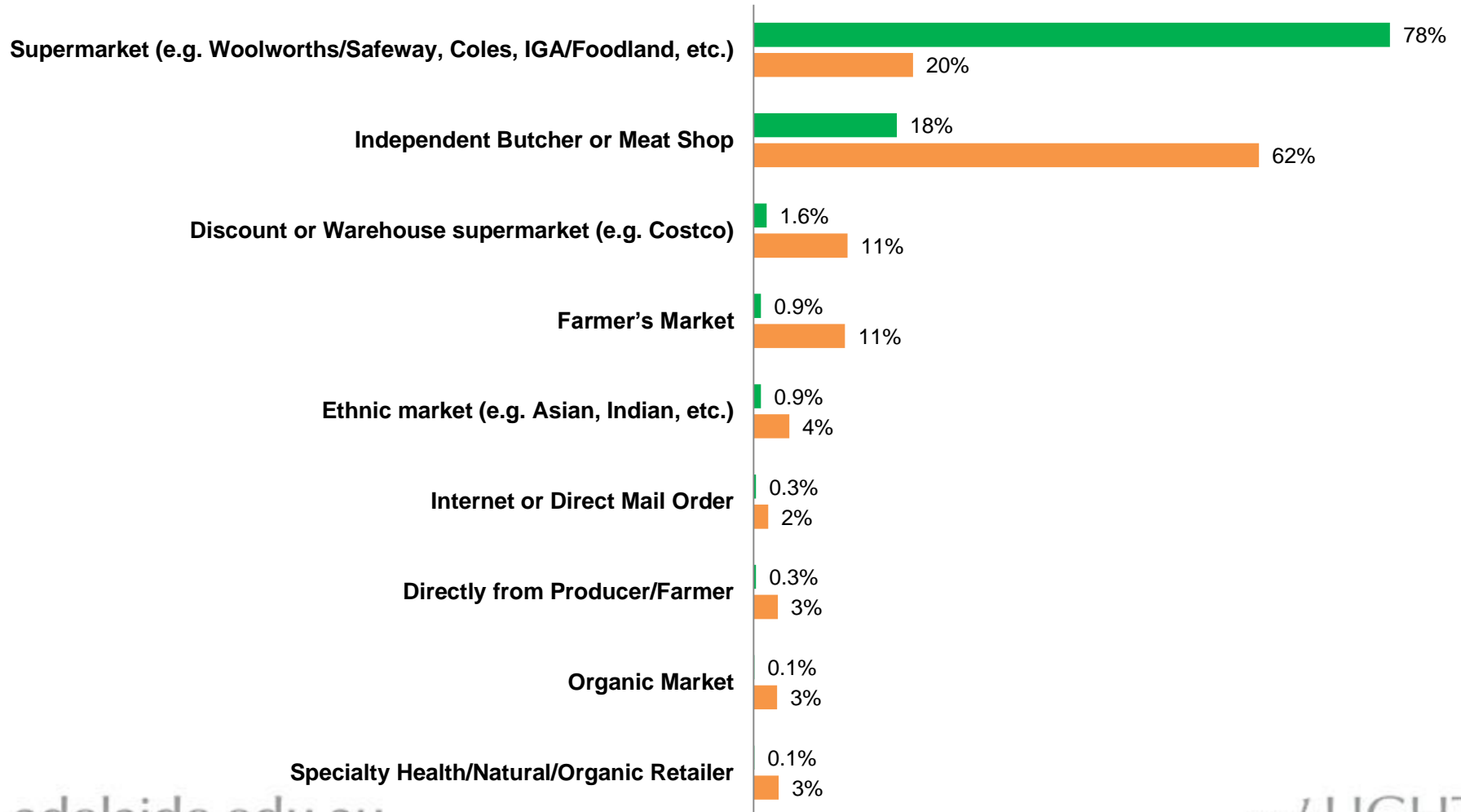


Frequency of at home meat preparation/consumption

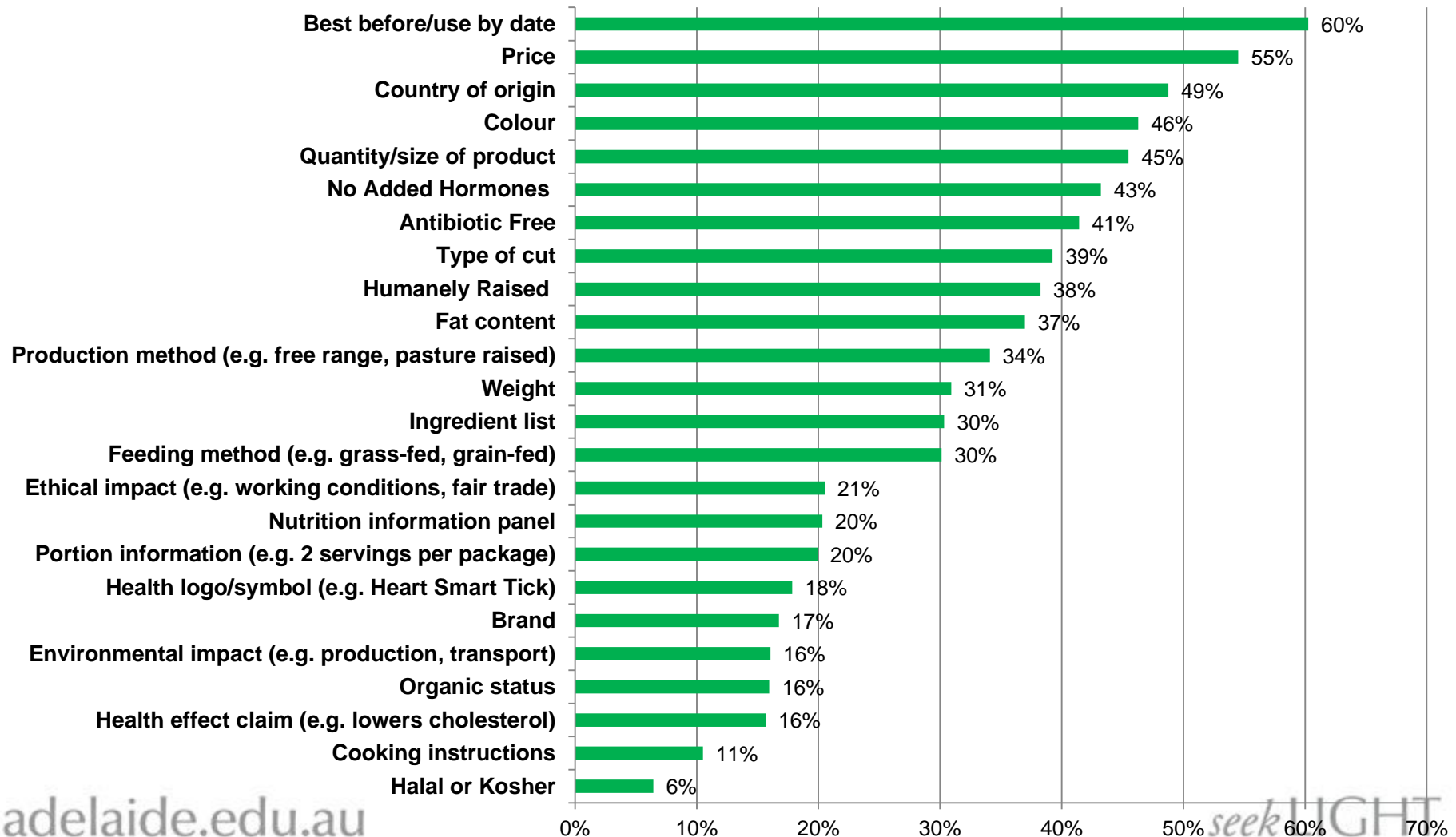


Meat purchase locations

■ Main Source ■ Sometimes a Source (could select more than one option)

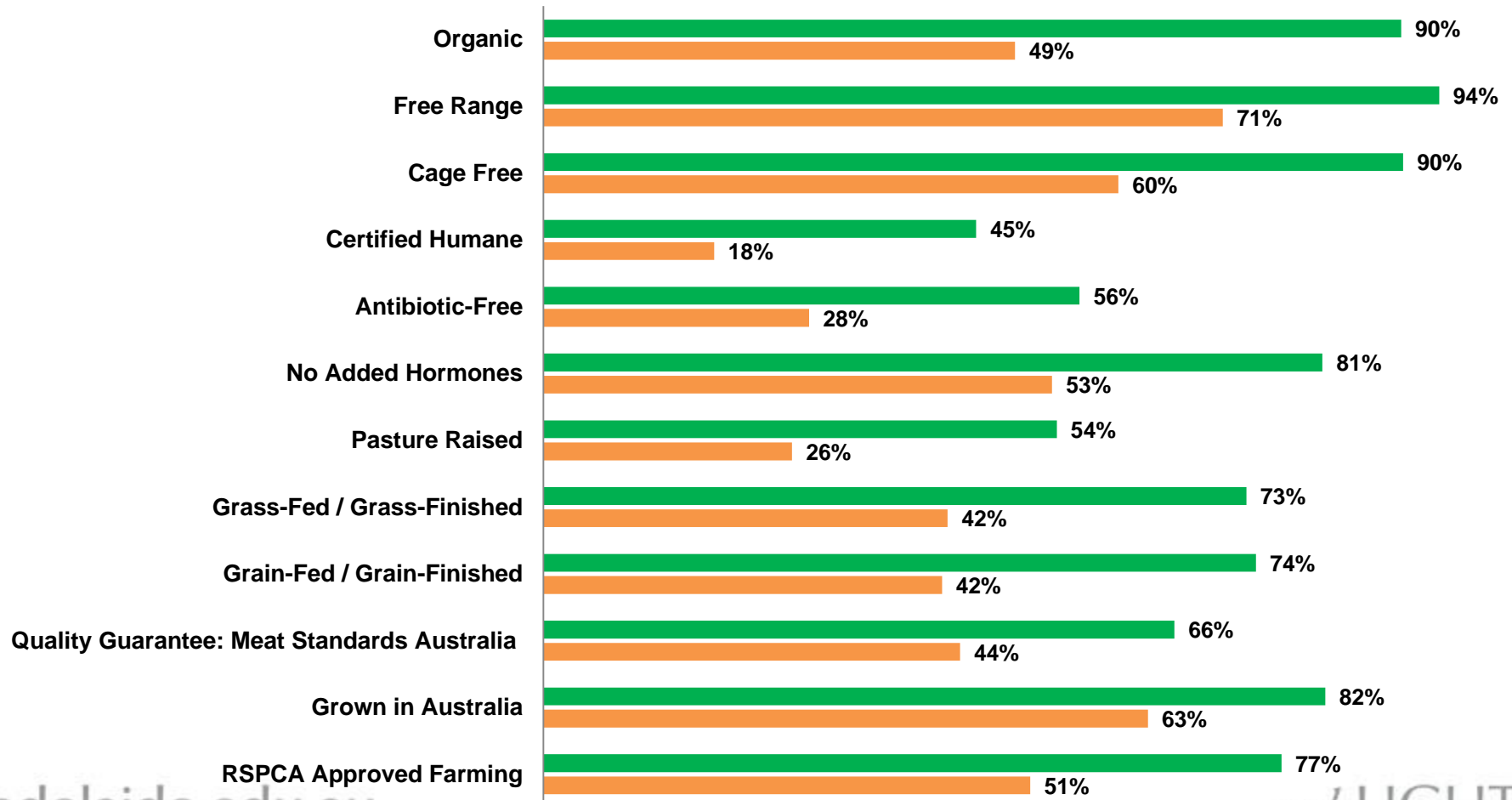


Meat labelling information considered very/extremely important



Previous awareness and purchase of meat with credence claims

■ Aware of claim ■ Purchased meat with claim



Consumer attitudes (moral value based Qs)

■ Agree
 ■ Somewhat agree
 ■ Neither agree nor disagree
 ■ Somewhat disagree
 ■ Disagree

The idea that meat comes from an animal gives me an uneasy feeling



Eating meat makes me feel ashamed



I feel good about eating meat



Eating meat is offensive, repulsive or disgusting



Humans have the right to use animals as they want



Vaccination of humans is important



The needs of humans are more important than the needs of farm production animals



Farm animals should be protected for their own sake rather than to simply meet the needs of humans.



People exaggerate the feelings and sensitivity of farm animals

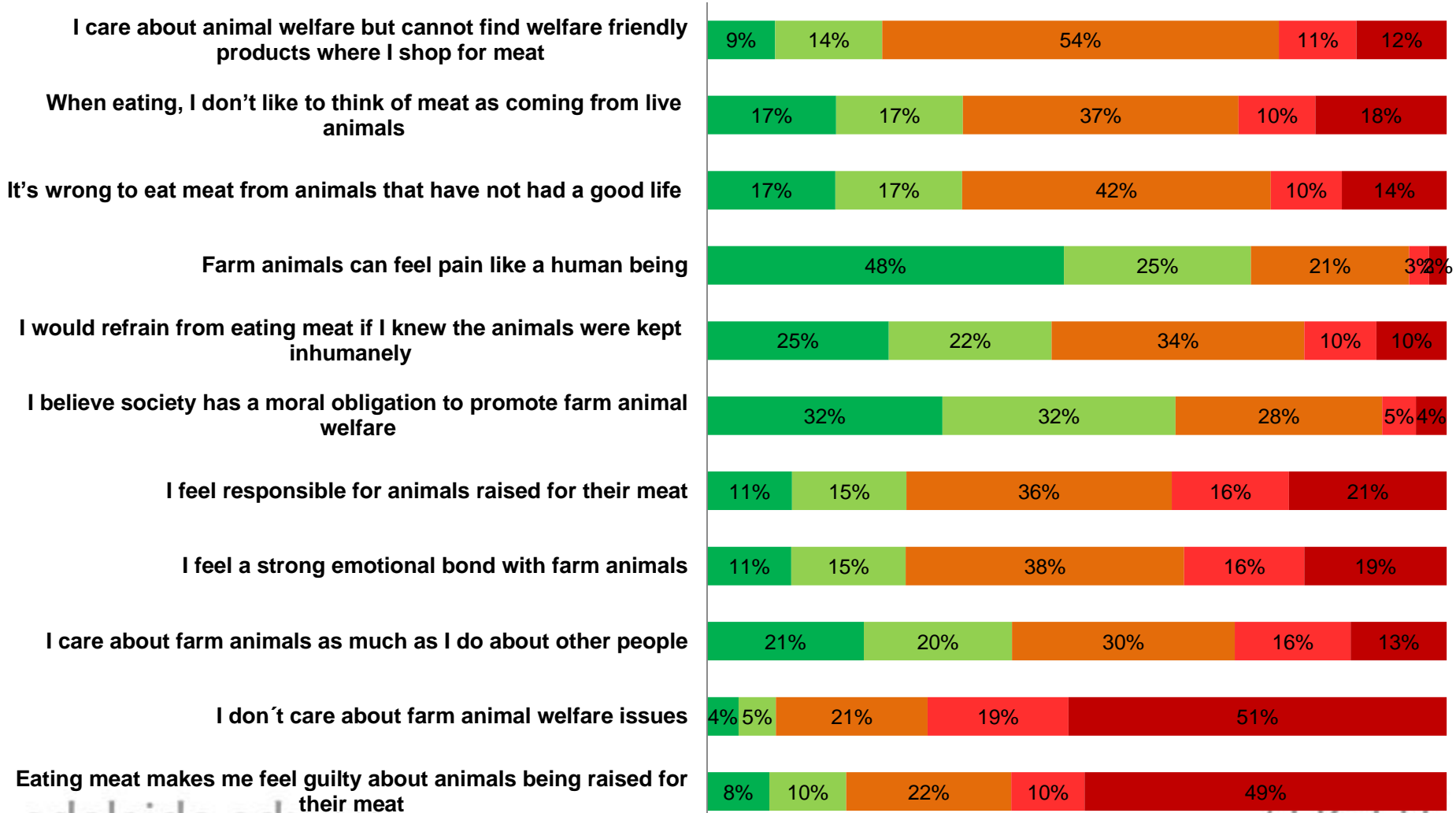


Farm animals should have rights similar to the rights of humans

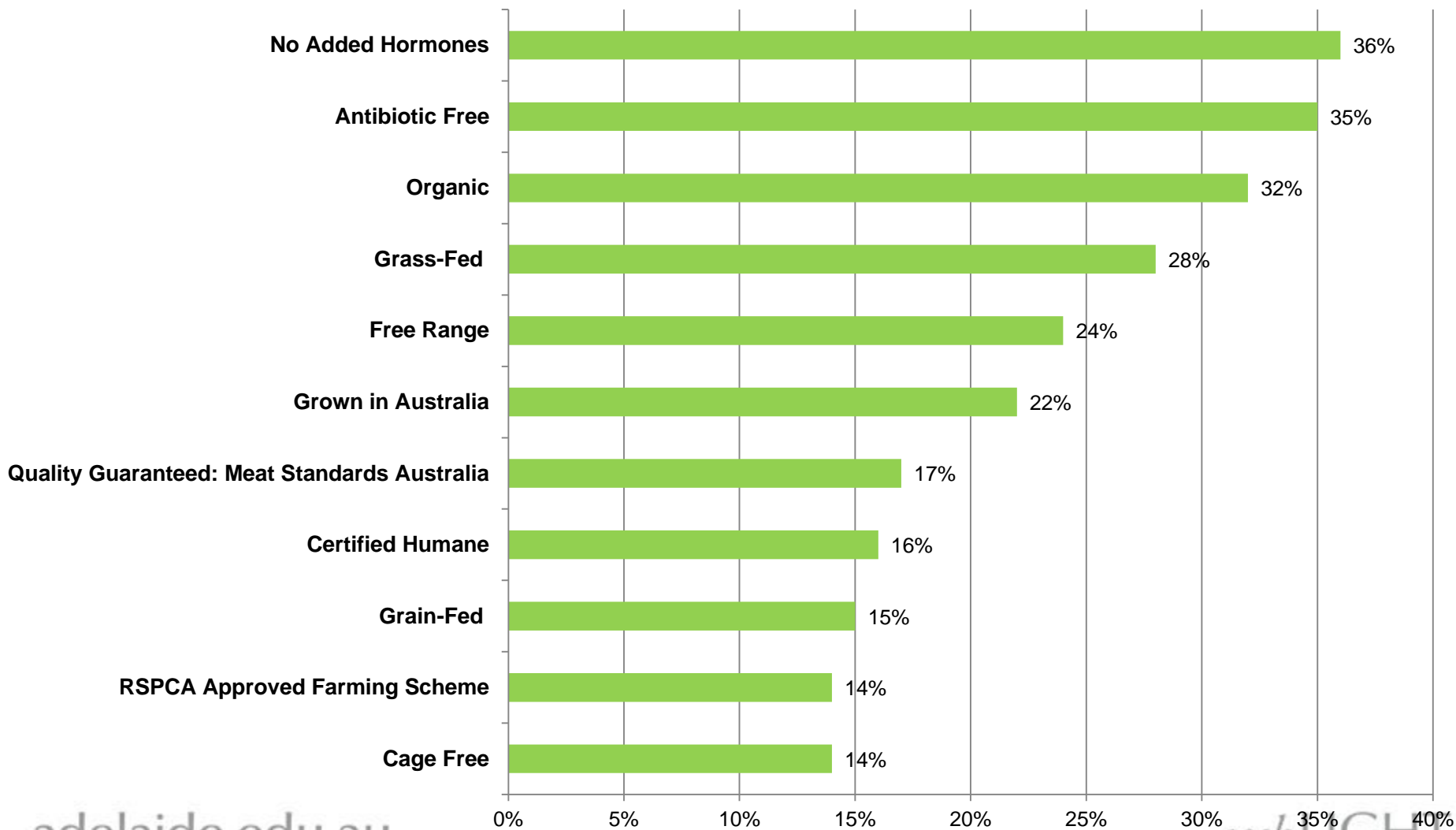


Consumer attitudes (moral value based Qs)

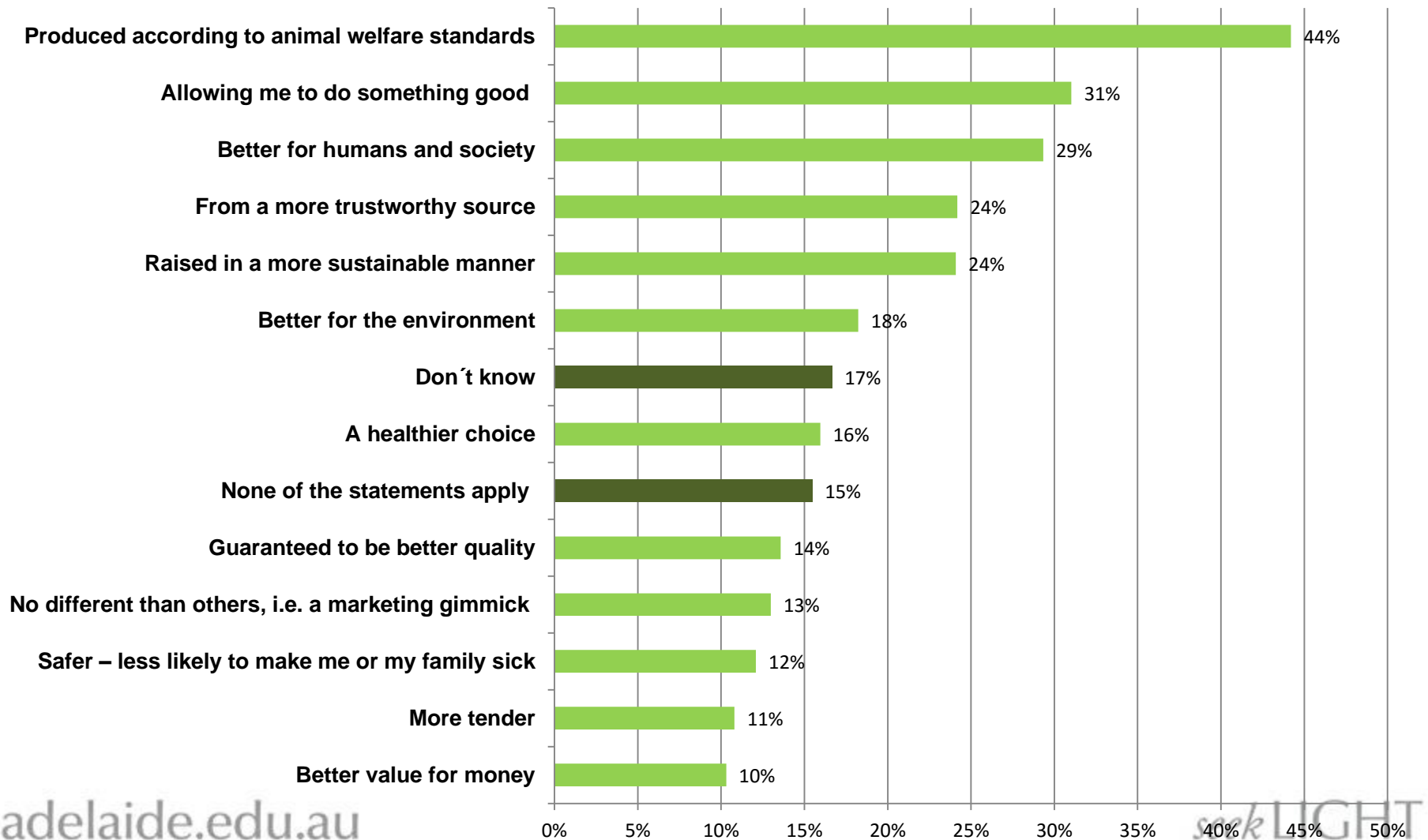
■ Agree
 ■ Somewhat agree
 ■ Neither agree nor disagree
 ■ Somewhat disagree
 ■ Disagree



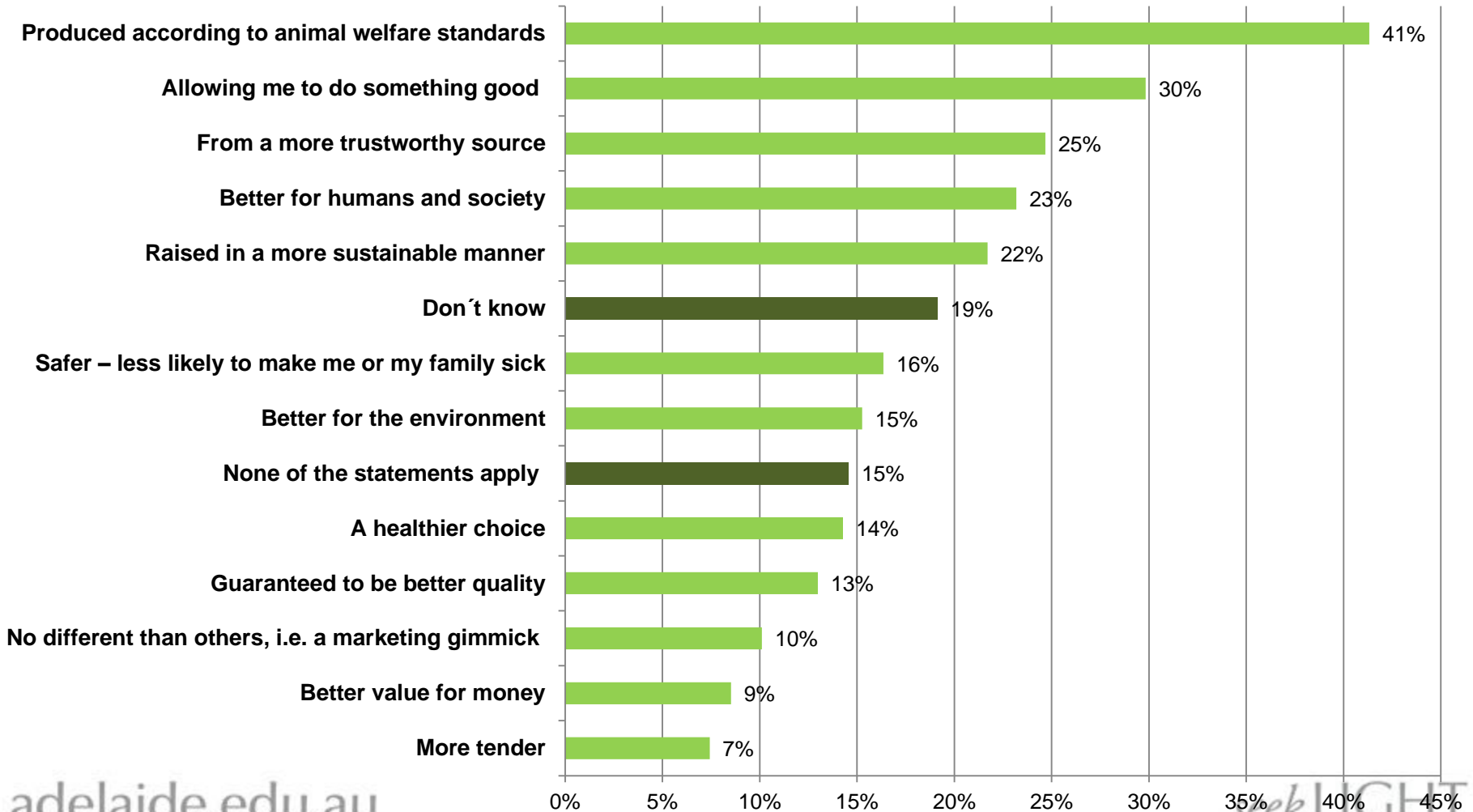
Believed to be 'a healthier choice'



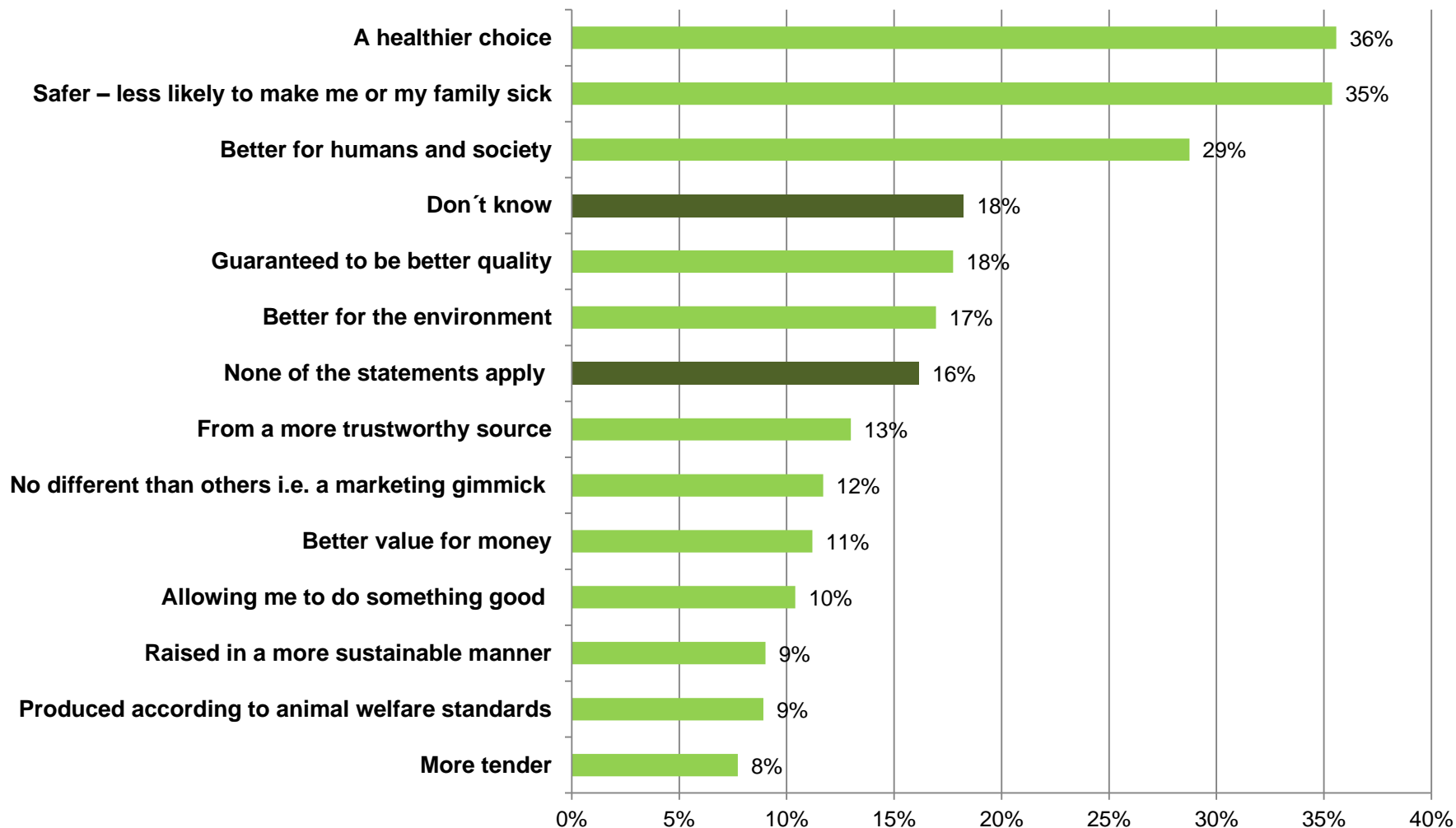
'Certified Humane' Perceptions



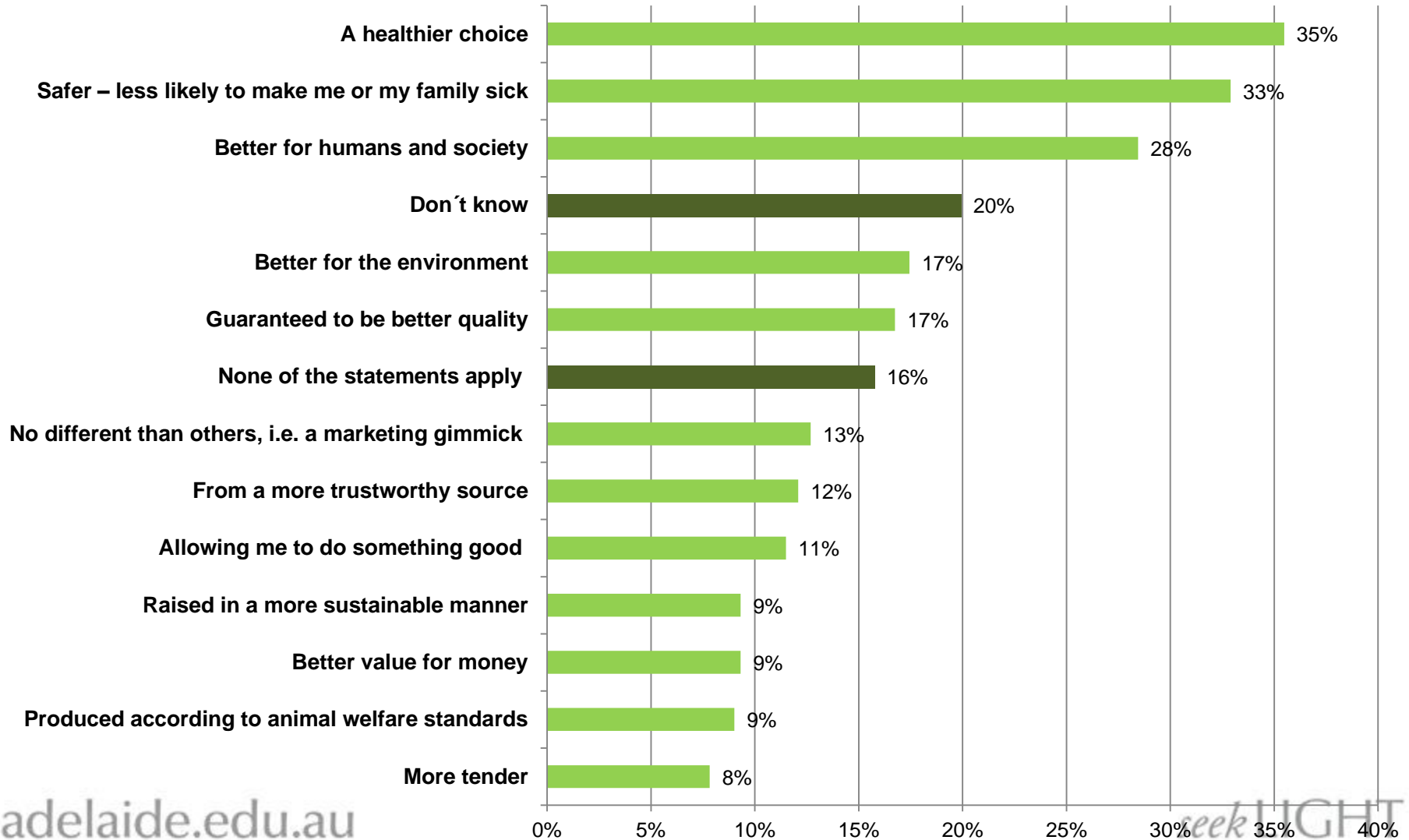
'RSPCA Approved Farming Scheme' Perceptions



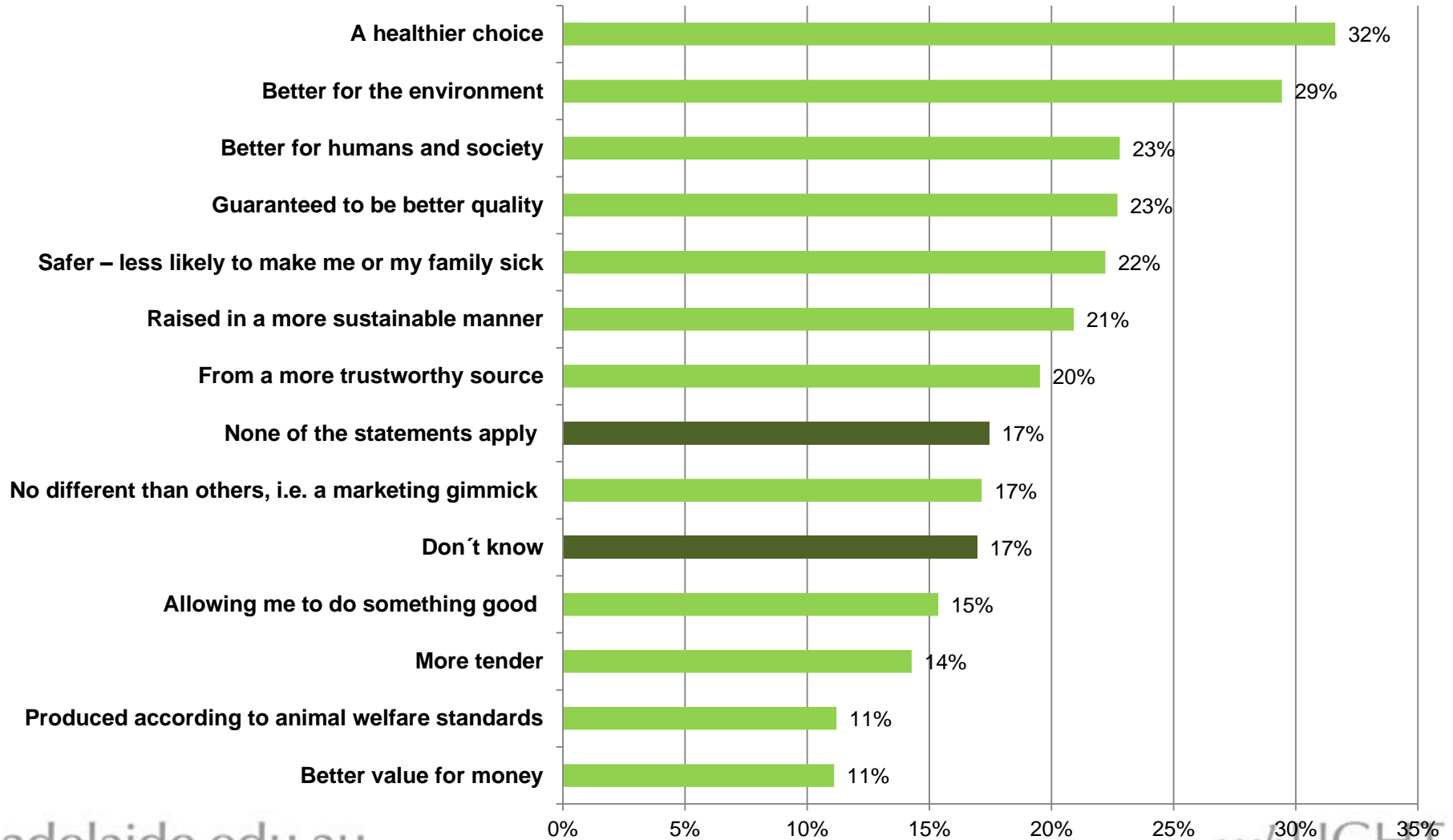
'No Added Hormones' Perceptions



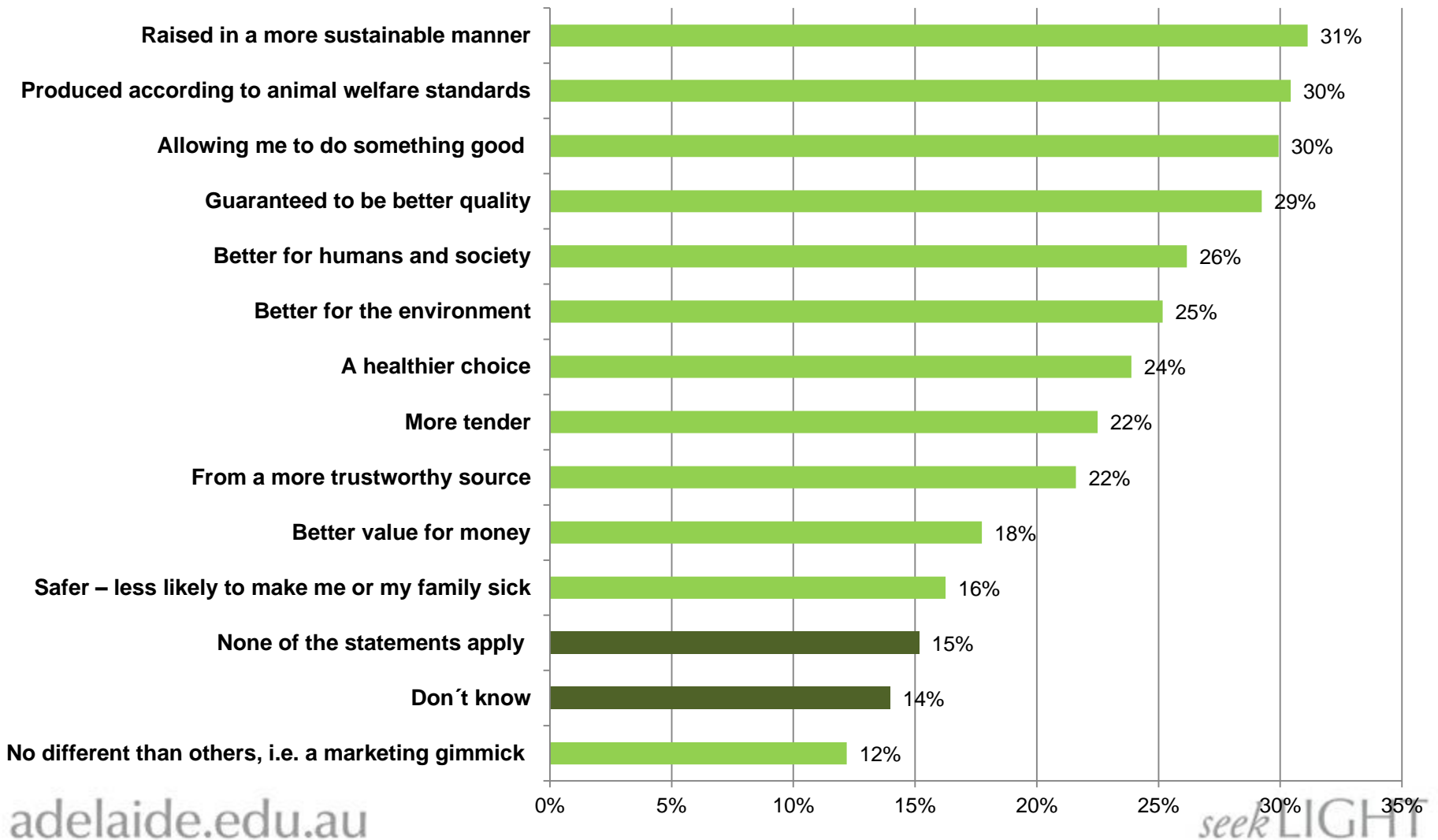
'Antibiotic Free' Perceptions



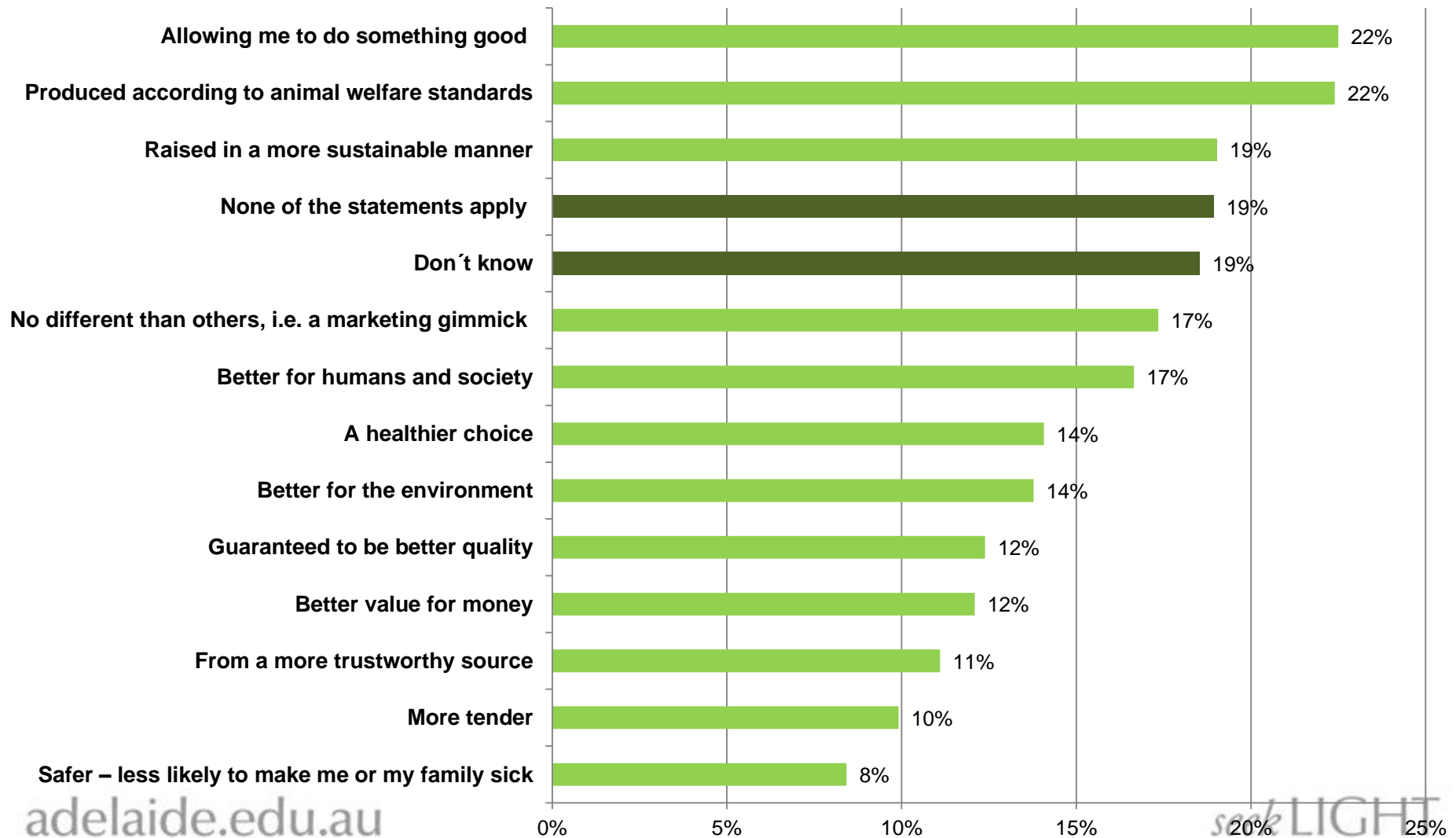
'Organic' Perceptions



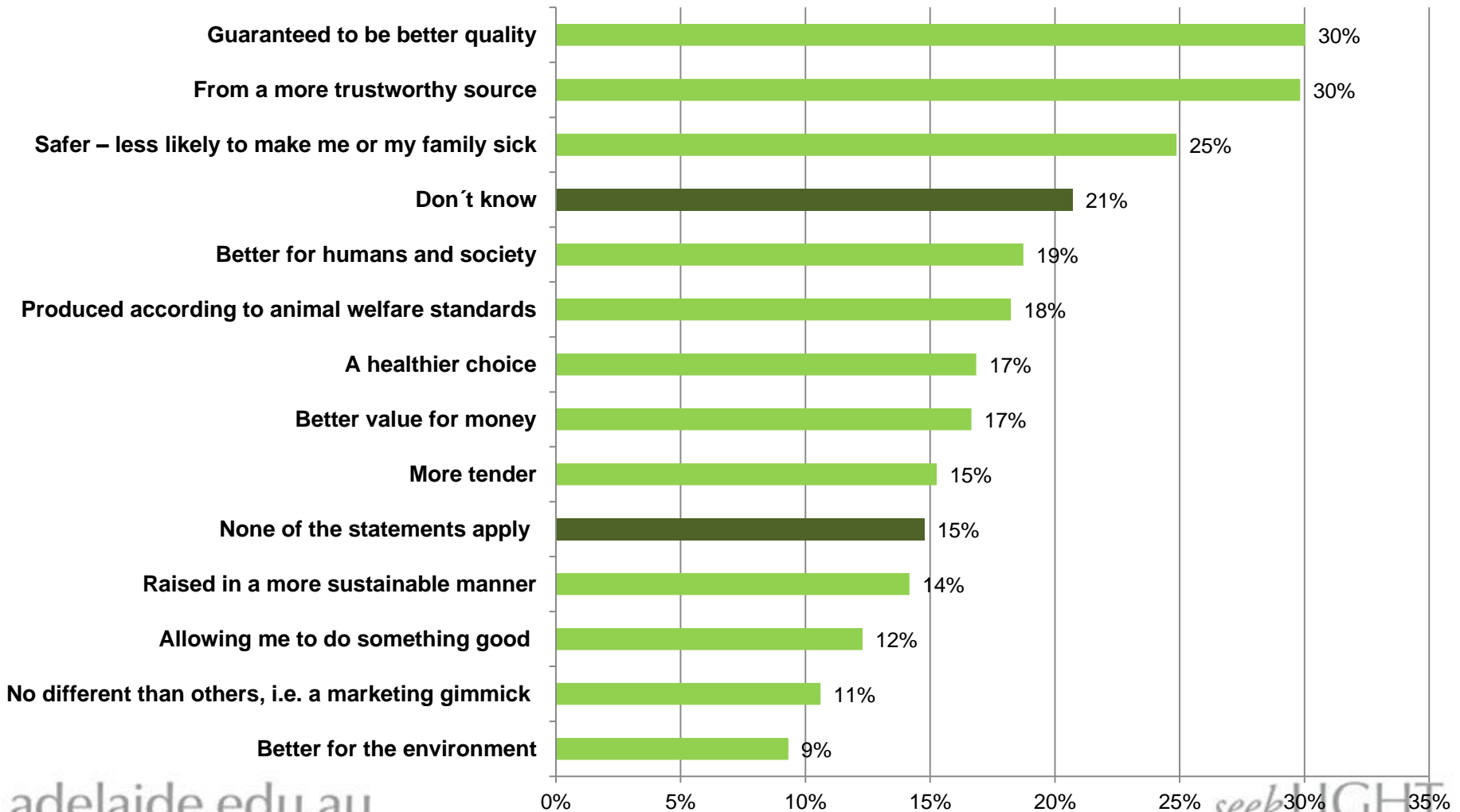
'Free Range' Perceptions



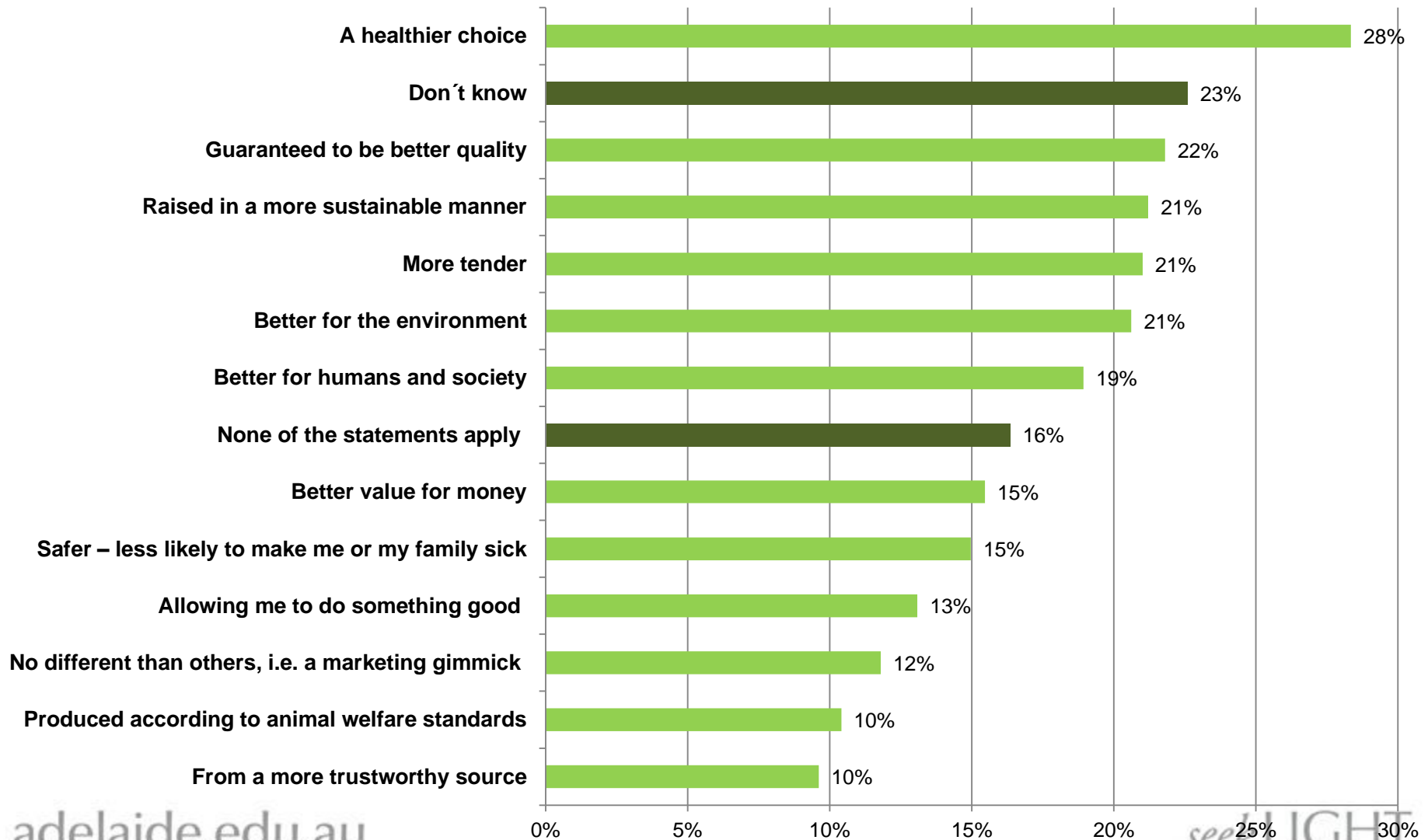
'Cage Free' Perceptions



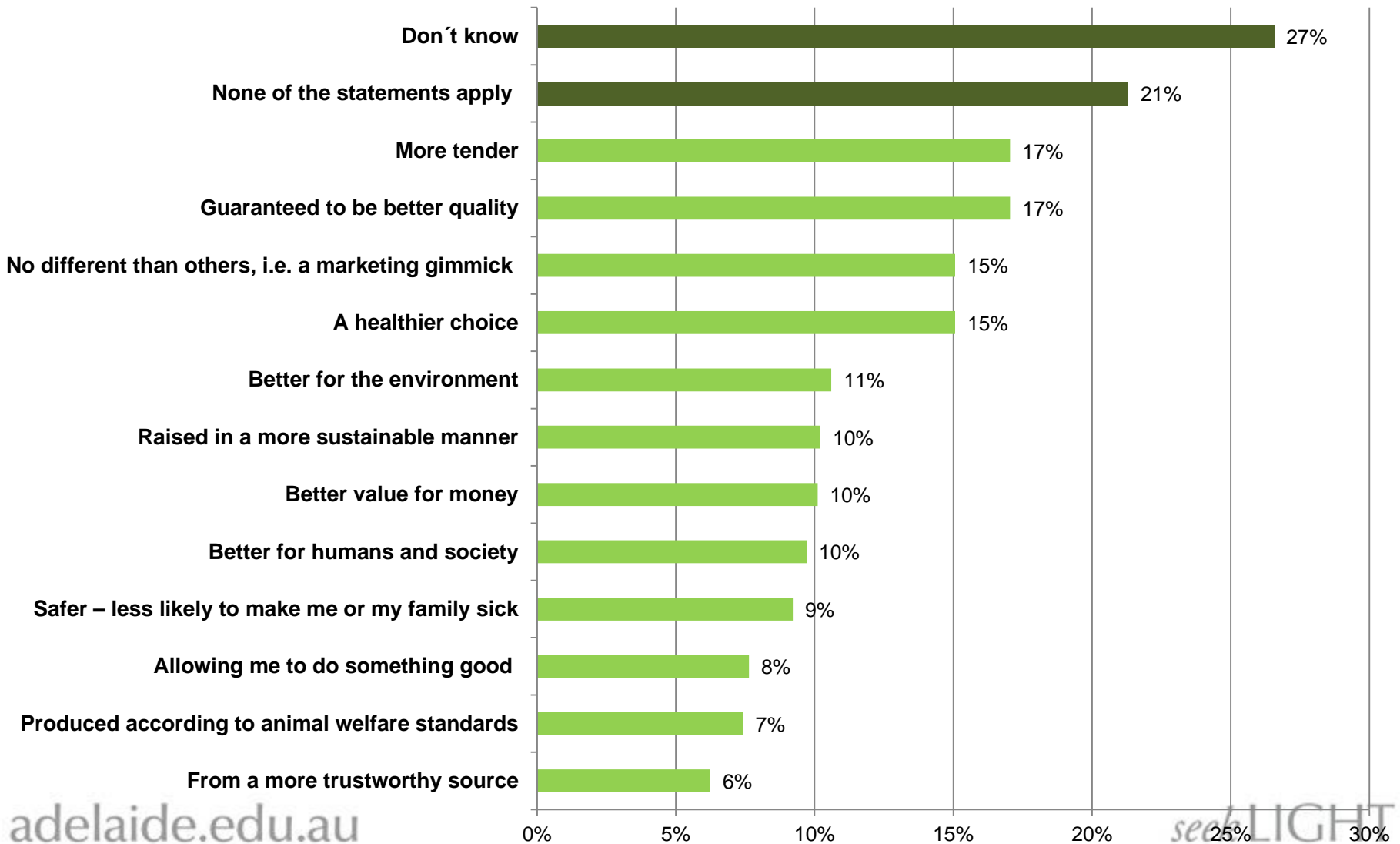
'Quality Guaranteed: Meat Standards Australia' Perceptions



'Grass-Fed' Perceptions



'Grain-Fed' Perceptions



'Grown in Australia' Perceptions

