Report on "Contains Animal-Derived Ingredients" Studies 1 and 2

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Executive Summary

In two studies, we found that people were moderately caring about knowing whether animal-derived ingredients were in products they bought, although they strongly cared about knowing what ingredients were in the products they bought. The dominant reason why they wanted to know what ingredients were in food was for health reasons. There was also a strong majority of people who thought that the ingredients list was where they would look to see a product's ingredients. In both studies, people were much more accurate identifying ingredients as plant-based compared to animal based. In Study 1, people were much better at correctly identifying products with only plant-derived ingredients compared to products with some animal-derived ingredients for both principal display panels and ingredients lists. Study 2 demonstrated that providing disclosures on principal display panels and nutrition labels made people much more accurate at identifying products with some animal-derived ingredients as containing some animal-derived ingredients.

Background

In general, there is a substantial literature on consumers' use of food product labels. Consumers are especially likely to use product labels in buying decisions if those labels present information on the front of the package, use minimal numerical information, include graphs and symbols, and use simple adjective or other descriptors (for a review, see (Campos, Doxey, & Hammond, 2011)). While consumers often accurately interpret and use product labels, consumers do not always use product information on labels or interpret that information correctly. Generally, as the computational complexity of the task increases (e.g., conversions, comparisons, calories per 100g to calories per gram), consumer confusion increases (Cowburn & Stockley, 2005; Hall & Osses, 2013; Hess, Visschers, & Siegrist, 2012).

We are aware of no studies that directly test whether consumers can accurately identify if a product contains animal-derived ingredients. There is some evidence that suggests that people can identify products as being animal-based or plant-based based on labeling (e.g., identifying 'almond milk' as being plant-based) (Baptista & Schifferstein, 2023; Feltz & Feltz, 2019; Gleckel, forthcoming). Other evidence suggests that plant-based products that are naturally plant based (i.e., not being designed to mimic traditionally animal-based products. E.g., hummus) are also correctly identified to be plant-based by consumers when they are labeled as such (Stremmel, Elshiewy, Boztug, & Carneiro-Otto, 2022).

Study 1

Survey

In Study 1, we set out to research consumers' interest in and understanding of animal-derived ingredients in food products. Specifically, we had the following research questions:

1. Do people care about knowing what ingredients their food has?
2. Why do people care about knowing what ingredients their food has?
3. Where would participants expect to see disclosures about animal-derived ingredients?
4. Can people accurately identify products as plant-based or having some animal-derived ingredients from the principal display panels alone?
5. Can people accurately identify products as plant-based or having some animal-derived ingredients from ingredient panels alone?
6. Can people identify individual ingredients as plant-based or animal-based?

We created an online survey hosted on Qualtrics and recruited 200 participants from CloudResearch (demographics in Table 1). CloudResearch is an online participant recruitment service. Evidence suggests samples taken from that service are acceptable and often as good as other samples (Douglas, Ewell, & Brauer, 2023).

Basic demographics are reported in Table 1.

Table 1. Demographics for Study 1. Politics was measured on a 1-7 scale where 1 = strongly liberal and 7 = strongly conservative.

	Age	**% Male**	**Politics**
Mean	39.345	49	3.320
SD	11.764		1.730
Minimum	18.000		1.000
Maximum	72.000		7.000

Values Results

Study 1 began by asking participants four questions about how much they value knowing food ingredients, how upset they would be to learn about surprise animal-derived ingredients, and how confident they feel about current ingredient labeling. Participants could respond on a scale from 1-6 with 1 = not at all and 6 = very much (or very upset/very confident).

Table 2: Responses to value questions in Study 1.

Values Question	Mean	SD	% > 3.5
How much do you value knowing what ingredients are in your food?	4.870	1.067	91%
How much do you value knowing whether a product contains animal-derived ingredients?	3.770	1.587	61%
How upset would you be to learn that a food you did not expect to contain animal-derived ingredients does, in fact, contain animal-derived ingredients?	3.425	1.667	47%
How confident are you that current ingredient lists contain all the information needed to determine whether a product has animal-derived ingredients?	3.770	1.267	64%

We then asked participants to select all reasons (from seven possible answers and participants could select more than 1 option) why they would be interested in a product's ingredients. Participants overwhelmingly selected "Health Concerns" as the motivating reason for wanting to know ingredients (87%), followed by "Food Allergies" (26%). In the results below (Table 3), the mean represents the percentage of respondents that selected each reason.

Table 3: Percent choosing options for why they are interested in a product's ingredients in Study 1.

Select all of the following reasons why YOU would be interested in a product's ingredients:	%
Kosher	3
Halal	3
Other Religious Reasons	2
Food Allergies	26
Vegan	2
Vegetarian	11
Health Concerns	87

Reading Labels

To get a better understanding of how participants read food labels, we presented them with a sample product packaging and asked where they would look to determine the product's ingredients. (Figure 1)

Figure 1: Product panels and key areas to identify a product's ingredients.

Participants were able to select all answers that applied (i.e., all places they would look to determine ingredients). Table 4 provides the percent of participants who selected the key areas where participants would look to the ingredients list.

Table 4: Percent selecting areas on labels where they would look for ingredients.

On the following food package, select all of the places you would look to determine the product's ingredients:	**%**
A	12
B	12
C	33
D	13
E	37
F	83
G	19
H	9

Identifying Animal-Derived Ingredients

Participants in Study 1 were presented with eight principal display panels and eight ingredients lists from actual products. Four of the principal display panels and four of the ingredients lists were from products that contained animal-derived ingredients, and the other four were from products that did not. Products were presented in random order.

Participants were also given a list of fifteen individual ingredients and asked to select all that are animal derived: Albumen, Agar, Carrageenan, Carmine, Casien, Citric Acid, Gelatin, L-cysteine, Omega-3, Lard, Lanolin, Pepsin, Rennet, Whey, and Xantham Gum.

Examples of principal display (Figure 2) and Ingredient Lists (Figure 3) presented to participants:

Figure 2: Example principal display panels

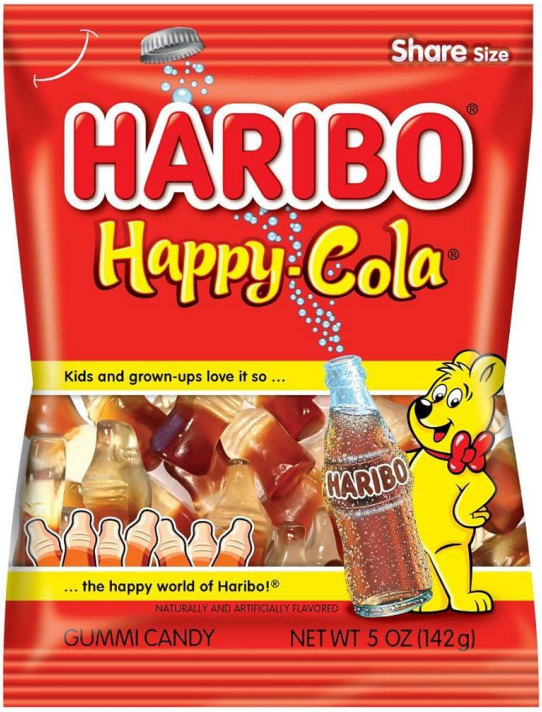
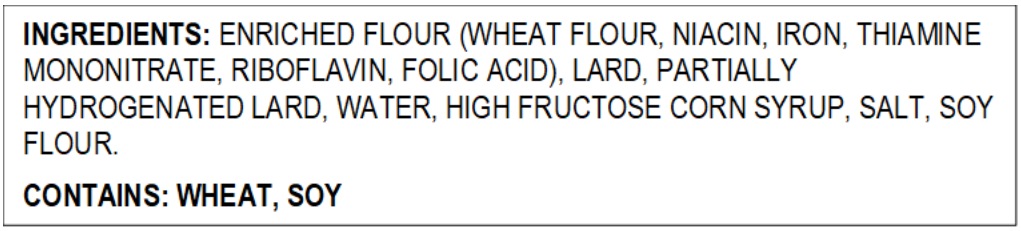
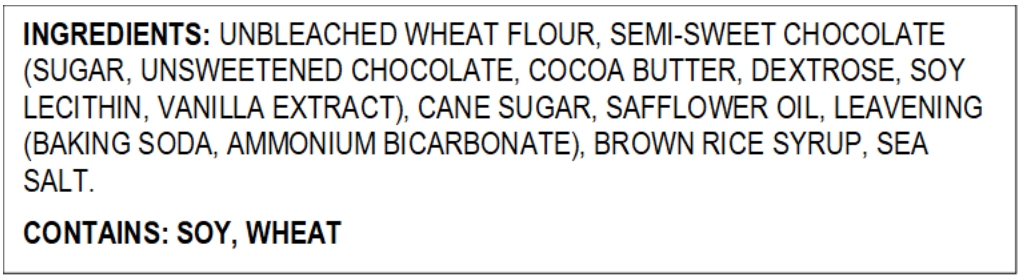


Figure 3: Example ingredients list.





We calculated correctly identifying a products as plant-based or animal-based averaged over the products (or individual ingredients) that were fully plant-based versus those that had some animal-derived ingredients. For the principal display panels and ingredient list, the total possible correct for each set of products was 4. For the individual ingredients, we calculated a percent correct for each of the plant-based and animal-based ingredients. The overall picture was clear: participants were more accurate at identifying plant-based products or ingredients compared to those with animal-derived ingredients. The effects were very strong, and this held true regardless of whether the questions were about principal display panels (Table 5), ingredient lists (Table 6), or individual ingredients (Table 7). Here, the Cohen's d ranged from 0.46 to 1.74, so we found medium to very large effects.

Table 5. Principal Display Panel Results

	N	Mean	SD
Plant-Based Products	200	2.200	0.930
Contains Animal-Derived Ingredients	200	1.455	0.896

$t(199) = 6.52$, $p < .01$, Cohen's $d = 0.461$

Table 6. Ingredients List Results

	N	Mean	SD
Plant-Based Products	200	3.465	0.913
Contains Animal-Derived Ingredients	200	1.445	1.069

$t(199) = 19.13, p < .01$, *Cohen's d* = 1.282

Table 7. Individual Ingredients Results. Percent indicates percent correctly identified.

	N	%
Plant-Based Products	200	71
Contains Animal-Derived Ingredients	200	28

$\chi = 9.53, p < .01$, *Cohen's h* = 0.55

These results have one clear take-away. People on average are better at identifying the plant-based products as plant-based compared to accurately identifying products with animal-derived ingredients as having animal-derived ingredients. Another way to look at these data is that if participants were randomly guessing at the responses, they should on average get 2 correct for each of the principal display panel and ingredients list tasks. But for each of those two tasks, people were significantly worse than chance at accurately identifying the animal-derived products (animal based principal display panel $t(199) = 8.61, p < 01, d = 0.61$; animal-based ingredients list $t(199) = 7.34, p < .01, d = 0.52$). However, for the plant-based products, they were significantly better than guessing (plant-based principal display panels $t(199) = 3.04, p < .01, d = 0.22$; plant-based ingredients list $t(199) = 22.70, p < .01, d = 1.61$). For the list of ingredients, if participants were randomly guessing, they would get 50% correct on average. Participants did significantly worse than guessing at identifying the ingredients in a list as animal-based ($\chi = 6.22, p < .01$) but were significantly better than chance at accurately identifying plant-based products ($\chi = 5.99, p < .01$). So not only were people better at identifying the plant-based products accurately compared to the animal-based products, people on average did also worse than chance at identifying the animal-based products and better than chance at identifying plant-based products. These results suggested that on average people were less likely to think that animal-based products contained animal-derived ingredients.

Second, while there was no increase in accuracy for animal-based products when comparing the results from the principal display panels and the ingredients list ($t(199) = 0.12, p = .91, d = 0.01$), people were better at accurately identifying plant-based products when given ingredients lists rather than just principal display panels ($t(199) = 14.04, p < .01, d = 0.99$). These results suggest that while providing a list of ingredients to people would help them understand plant-based products as plant-based, providing those ingredients alone would not help people identify products with animal-derived ingredients.

Study 2

Survey

In Study 2, we set out to research the efficacy of affirmative disclaimers on the principal display panel or ingredients list on consumers' ability to tell if a food product contains animal-derived ingredients. Specifically, we had the following research questions:

1. Do people care about knowing what ingredients their food has?
2. Why do people care about knowing what ingredients their food has?
3. Where would they expect to see ingredients listed?
4. Can people more accurately identify products as having some animal-derived ingredients from the principal display panel with an animal-based disclosure included?
5. Can people more accurately identify products as having some animal-derived ingredients from ingredient lists with an animal-based disclosure?
6. Can people identify ingredients as plant-based or animal-based?

Again, we used Qualtrics and recruited 206 participants from CloudResearch. Seven participants were excluded for not completing the entire survey. Basic demographics for the remaining 199 are reported in Table 8.

Table 8. Basic demographics for Study 2.

	Age	**% Male**	**Politics**
Mean	41.291	49	3.638
Std. Deviation	13.420		1.809
Minimum	18.000		1.000
Maximum	80.000		7.000

Values Results

Study 2 began with the same four questions about how much participants value knowing food ingredients, how upset they would be to learn about surprise animal-derived ingredients, and how confident they feel about current ingredient labeling. Participants could respond on a scale from 1-6 with 1 = not at all and 6 = very much (or very upset/very confident). Descriptive statistics reported in Table 9.

Table 9. Results from the value questions in Study 2.

Values Question	Mean	SD	% > 3.5
How much do you value knowing what ingredients are in your food?	4.779	1.069	85.9%
How much do you value knowing whether a product contains animal-derived ingredients?	3.683	1.519	54.7%
How upset would you be to learn that a food you did not expect to contain animal-derived ingredients does, in fact, contain animal-derived ingredients?	3.467	1.657	50.7%
How confident are you that current ingredient lists contain all the information needed to determine whether a product has animal-derived ingredients?	3.623	1.327	55.8%

As in Study 1, we also asked participants to select all reasons (from seven possible answers) why they would be interested in a product's ingredients. Again, participants overwhelmingly selected "Health Concerns" as the motivating reason for wanting to know ingredients (87.9%), followed by "Food Allergies" (32.7%). Participants could select more than one option. Percent of participants selecting each option is reported in Table 10.

Table 10. Percent selection reasons for being interested in a product's ingredients.

Select all of the following reasons why YOU would be interested in a product's ingredients:	%
Kosher	5
Halal	1
Other Religious Reasons	5
Food Allergies	33
Vegan	3
Vegetarian	11
Health Concerns	88

Reading Labels

As in Study 1, we presented participants with a sample product packaging and asked where they would look to determine the product's ingredients. Participants were able to select all answers that applied (i.e., all places they would look to determine ingredients). Table 11 reports the percentages of people who selected the areas. The results again found that most participants would look to the ingredients list.

Table 11. Percentages of participants selecting locations on labels.

On the following food package, select all of the places you would look to determine the product's ingredients:	**%**
A	12
B	11
C	25
D	9
E	47
F	83
G	22
H	8

Identifying Animal-Derived Ingredients

The next set of analyses we ran were to determine if including a disclosure helped people's accuracy at identifying the products as animal-based. We selected eight photos of principal display panels and eight ingredients lists from actual products. Then, for each product, we created a version of the principal display panels and the ingredients list with a disclaimer that the product contained animal-derived ingredients. All products contained animal-derived ingredients.

Examples of principal display panels with (right panel) and without disclaimers (left panel), as presented to participants, are in Figure 4.

Figure 4. Example principal display panels for products in Study 2.

Example of ingredients list without (upper panel) and with (lower panel) disclaimers (Figure 5).

Figure 5. Example of ingredients list in Study 2.

INGREDIENTS: PEANUTS, CONTAINS LESS THAN 2% OR LESS OF: SEA SALT, SPICES (CONTAINS CELERY), DRIED ONION, DRIED GARLIC, PAPRIKA, NATURAL FLAVOR, SUGAR, CORN STARCH, GELATIN, TORULA YEAST, MALTODEXTRIN, DRIED CORN SYRUP.

CONTAINS: PEANUT

INGREDIENTS: PEANUTS, CONTAINS LESS THAN 2% OR LESS OF: SEA SALT, SPICES (CONTAINS CELERY), DRIED ONION, DRIED GARLIC, PAPRIKA, NATURAL FLAVOR, SUGAR, CORN STARCH, GELATIN, TORULA YEAST, MALTODEXTRIN, DRIED CORN SYRUP.

CONTAINS: PEANUT AND ANIMAL-DERIVED INGREDIENTS

Participants were randomly shown four photos without a disclaimer and four photos with a disclaimer, as well as four ingredients lists without a disclaimer and four ingredients lists with a disclaimer. For each of the eight principal display panels and eight ingredients lists, participants were asked: "Does the following product contain animal-derived ingredients?" Correct answers were coded as 1 and incorrect answers as 0.

In analyzing the results, we looked at overall proportion correct as a function of having the disclosure that the products contained animal-derived ingredients. The results show that the disclaimer helped participants understand whether a product contained animal-derived ingredients (see Tables 12 and 13 for χ^2 tests and odds ratios). All the effects were large and in the same direction (see Figures 6 and 7 for a bar graph of percentages correct for each product as a function of disclosures).

Table 12. Principal Display Panel Results Statistical Tests for Study 2. Odds ratios indicates how many times more likely participants in the disclosed condition could accurately identify the products.

Product	χ^2	***p***	**Odds Ratio**
Thomas' Original English Muffins	85.01	< .01	25.28
Doritos Salsa Verde	114.58	< .01	52.63
Haribo Goldbears	80.03	< .01	26.54
Rosarita Traditional Refried Beans	95.13	< .01	32
Rao's Homemade Basil Pesto	108.78	< .01	45.45
KIND Dark Chocolate Nuts & Sea Salt	119.13	< .01	76.93
Progresso Southwest-Style Black Bean Soup	107.52	< .01	52.57
Total 100% Whole Grain Flakes	123.21	< .01	111.11

Figure 6. Mean percent correct for principal display panels in Study 2 as a function of disclosures.

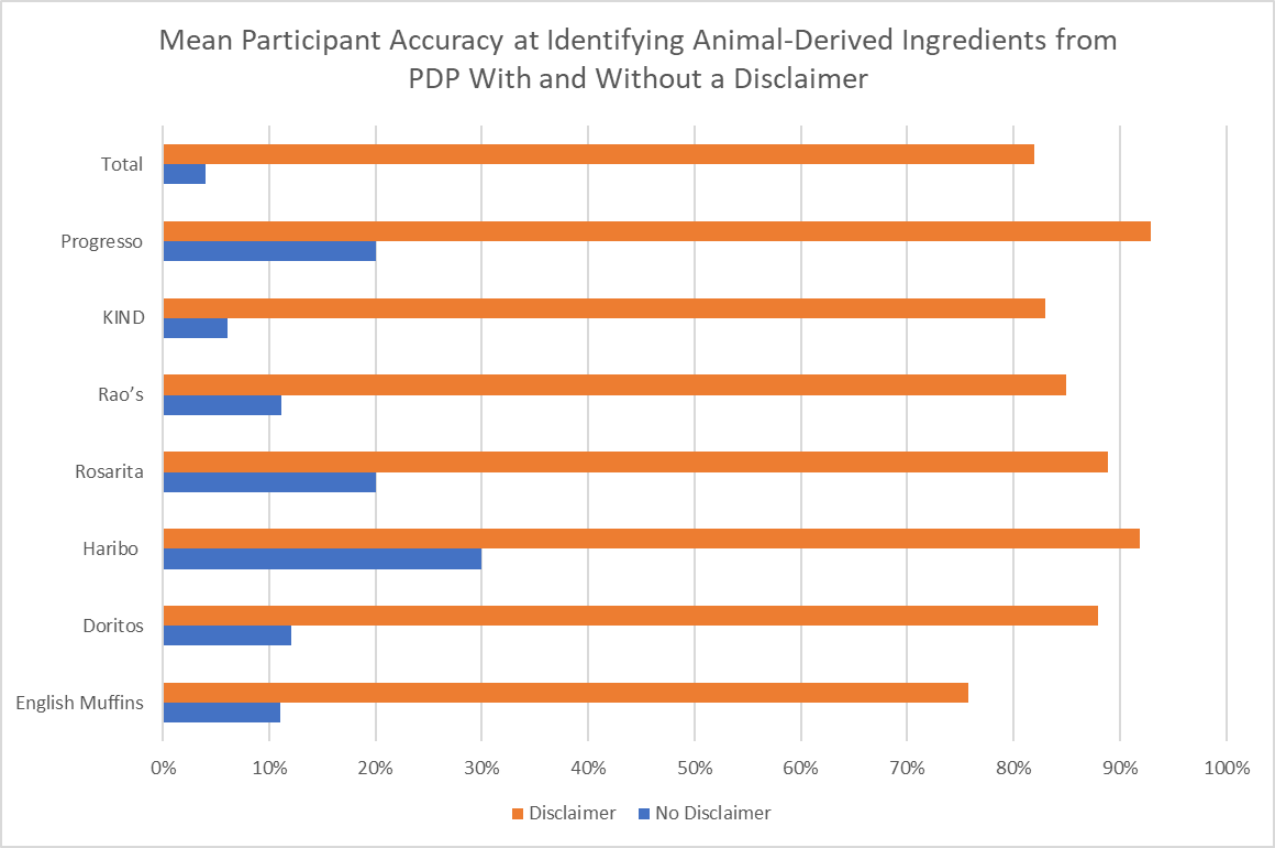
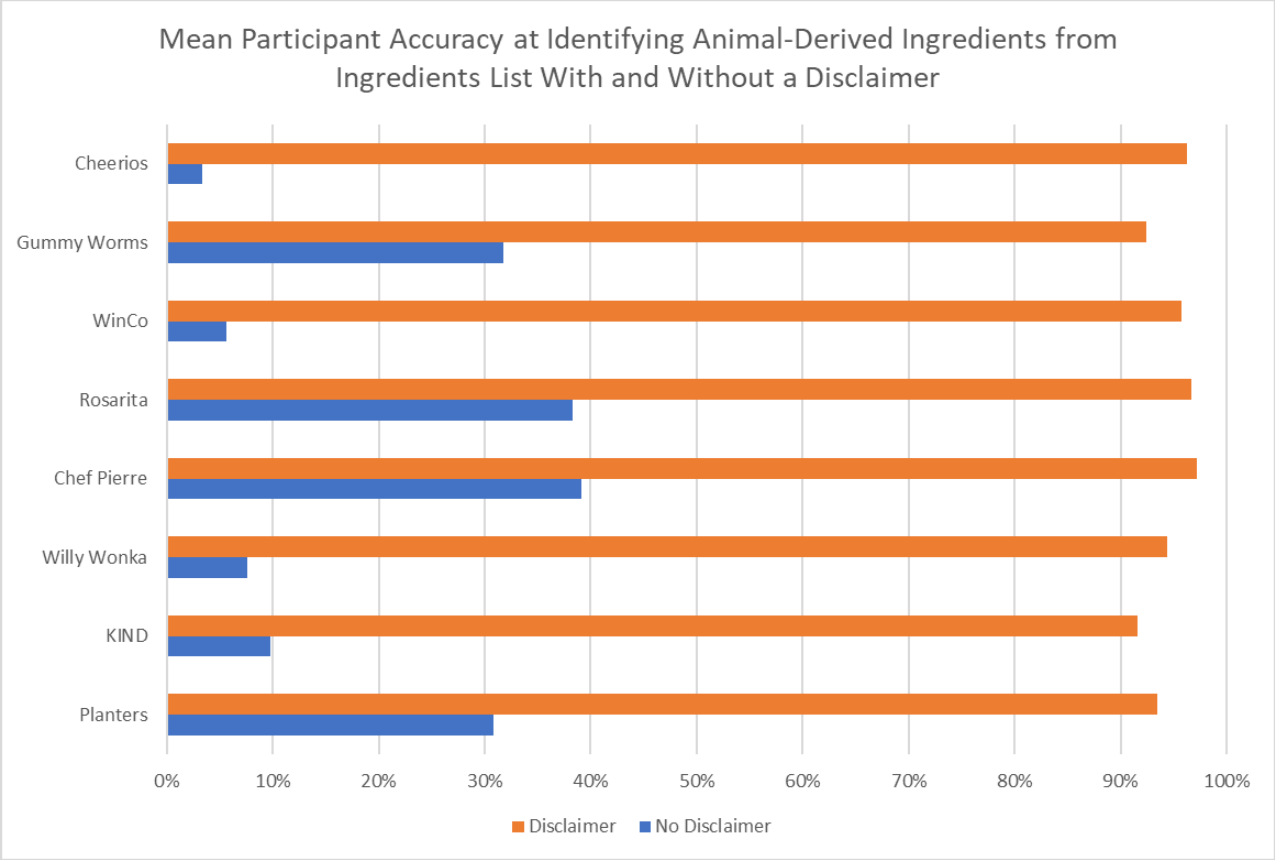


Table 13. Ingredients label statistical tests for Study 2.

Product	χ^2	***p***	**Odds Ratio**
Planters Dry Roasted Peanuts	80.73	< .01	32.26
KIND Dark Chocolate Nuts & Sea Salt	113.18	< .01	100.42
Willy Wonka Grape & Strawberry Nerds	150.12	< .01	204.41
Chef Pierre 9" Unbaked Pie Shells	79.96	< .01	53.93
Rosarita Spicy Jalapeño Refried Beans	74.54	< .01	47.62
WinCo Bagels	160.93	< .01	333.33
Great Value Gummy Worms	75.61	< .01	26.32
General Mills Apple Cinnamon Cheerios	763.92	< .01	763.92

Figure 7. Mean percent correct for ingredients list in Study 2 as a function of disclosures.



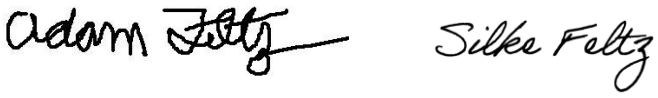
As with Study 1, we also presented participants a list of fifteen individual ingredients. Replicating the results from Study 1, participants were better at identifying the plant-based ingredients than the animal-based ingredients.

Table 14. Individual Ingredients Results. Percent indicates percent correctly identified for Study 2.

	N	%
Plant-Based Products	199	86
Contains Animal-Derived Ingredients	199	29

$\chi = 12.52$, $p < .01$, *Cohen's h* $= 0.56$

The results from Study 2 replicated the results from Study 1 concerning caring about knowing what ingredients a product has, reasons for caring, location one would look to find ingredients, accuracy identifying animal-based products without disclosures, and accuracy identifying plant-based and animal-based ingredients from a list of ingredients. However, Study 2 also suggested that there is a very large increase with a simple change to labeling—including a disclosure that the product contains animal derived ingredients.



More Detailed Analyses of the Animal-Ingredient Label Survey Data

Study 1

Below are the full t-test results for the PDP comparison based on number correct for each of plant-based and animal-based products:

Paired Samples T-Test ▼

								95% CI for Cohen's d	
Measure 1		Measure 2	t	df	p	Cohen's d	SE Cohen's d	Lower	Upper
PDPPBTOT	-	PDPABTOT	6.518	199	< .001	0.461	0.132	0.315	0.606

Note. Student's t-test.

Descriptives

Descriptives

	N	Mean	SD	SE	Coefficient of variation
PDPPBTOT	200	2.200	0.930	0.066	0.423
PDPABTOT	200	1.455	0.896	0.063	0.615

Below are the full t-test results for the Ingredients List comparison:

Paired Samples T-Test

								95% CI for Cohen's d	
Measure 1		Measure 2	t	df	p	Cohen's d	SE Cohen's d	Lower	Upper
NutritionPBTOT	-	NutritionABTOT	18.133	199	< .001	1.282	0.151	1.094	1.468

Note. Student's t-test.

Descriptives

Descriptives

	N	Mean	SD	SE	Coefficient of variation
NutritionPBTOT	200	3.465	0.913	0.065	0.263
NutritionABTOT	200	1.445	1.069	0.076	0.740

Below are the full percent correct for each of the Individual Ingredients task:

Frequency Tables

Frequencies for Albumen

Albumen	Frequency	Percent	Valid Percent	Cumulative Percent
0	160	80.000	80.000	80.000
1	40	20.000	20.000	100.000
Missing	0	0.000		
Total	200	100.000		

Frequencies for Agar

Agar	Frequency	Percent	Valid Percent	Cumulative Percent
0	192	96.000	96.000	96.000
1	8	4.000	4.000	100.000
Missing	0	0.000		
Total	200	100.000		

Frequencies for Carrageenan

Carrageenan	Frequency	Percent	Valid Percent	Cumulative Percent
0	13	6.500	6.500	6.500
1	187	93.500	93.500	100.000
Missing	0	0.000		
Total	200	100.000		

Frequencies for Carmine

Carmine	Frequency	Percent	Valid Percent	Cumulative Percent
0	174	87.000	87.000	87.000
1	26	13.000	13.000	100.000
Missing	0	0.000		
Total	200	100.000		

Frequencies for Casien

Casien	Frequency	Percent	Valid Percent	Cumulative Percent
0	147	73.500	73.500	73.500
1	53	26.500	26.500	100.000
Missing	0	0.000		
Total	200	100.000		

Frequencies for Cirtic Acid

Cirtic Acid	Frequency	Percent	Valid Percent	Cumulative Percent
0	6	3.000	3.000	3.000
1	194	97.000	97.000	100.000
Missing	0	0.000		
Total	200	100.000		

Frequencies for Gelatin

Gelatin	Frequency	Percent	Valid Percent	Cumulative Percent
0	57	28.500	28.500	28.500
1	143	71.500	71.500	100.000
Missing	0	0.000		
Total	200	100.000		

Frequencies for L-cysteine

L-cysteine	Frequency	Percent	Valid Percent	Cumulative Percent
0	183	91.500	91.500	91.500
1	17	8.500	8.500	100.000
Missing	0	0.000		
Total	200	100.000		

Frequencies for Omega-3

Omega-3	Frequency	Percent	Valid Percent	Cumulative Percent
0	69	34.500	34.500	34.500
1	131	65.500	65.500	100.000
Missing	0	0.000		
Total	200	100.000		

Frequencies for Lard

Lard	Frequency	Percent	Valid Percent	Cumulative Percent
0	35	17.500	17.500	17.500
1	165	82.500	82.500	100.000
Missing	0	0.000		
Total	200	100.000		

Frequencies for Lanolin

Lanolin	Frequency	Percent	Valid Percent	Cumulative Percent
0	200	100.000	100.000	100.000
Missing	0	0.000		
Total	200	100.000		

Frequencies for Pepsin

Pepsin	Frequency	Percent	Valid Percent	Cumulative Percent
0	180	90.000	90.000	90.000
1	20	10.000	10.000	100.000
Missing	0	0.000		
Total	200	100.000		

Frequencies for Rennet

Rennet	Frequency	Percent	Valid Percent	Cumulative Percent
0	163	81.500	81.500	81.500
1	37	18.500	18.500	100.000
Missing	0	0.000		
Total	200	100.000		

Frequencies for Whey

Whey	Frequency	Percent	Valid Percent	Cumulative Percent
0	146	73.000	73.000	73.000
1	54	27.000	27.000	100.000
Missing	0	0.000		
Total	200	100.000		

Frequencies for Xantham Gum

Xantham Gum	Frequency	Percent	Valid Percent	Cumulative Percent
0	14	7.000	7.000	7.000
1	186	93.000	93.000	100.000
Missing	0	0.000		
Total	200	100.000		

Study 2

Below are the full chi-squared results for the PDP comparison:

Contingency Tables

Contingency Tables

	LabelSet3v2		
EnglishMufin	**2**	**3**	**Total**
0	89	24	113
1	11	75	86
Total	100	99	199

Chi-Squared Tests

	Value	df	p
X^2	85.014	1	< .001
N	199		

Odds Ratio

		95% Confidence Intervals		
	Odds Ratio	**Lower**	**Upper**	**p**
Odds ratio	25.284	11.626	54.989	
Fisher's exact test	24.706	11.008	60.207	< .001

Contingency Tables

	LabelSet3v2		
Doritos	**2**	**3**	**Total**
0	12	87	99
1	88	12	100
Total	100	99	199

Chi-Squared Tests

	Value	df	p
X^2	114.576	1	< .001
N	199		

Odds Ratio

		95% Confidence Intervals		
	Odds Ratio	**Lower**	**Upper**	**p**
Odds ratio	0.019	0.008	0.044	
Fisher's exact test	0.020	0.007	0.047	< .001

Contingency Tables

	LabelSet3v2

Odds Ratio

			95% Confidence Intervals		
		Odds Ratio	Lower	Upper	p

Haribo	2	3	Total
0	70	8	78
1	30	91	121
Total	100	99	199

Chi-Squared Tests

	Value	df	p
X^2	80.031	1	< .001
N	199		

Odds Ratio

		95% Confidence Intervals		
	Odds Ratio	Lower	Upper	p
Odds ratio	26.542	11.460	61.470	
Fisher's exact test	25.951	10.910	70.052	< .001

Contingency Tables

	LabelSet3v2		
Rosarita	2	3	Total
0	80	11	91
1	20	88	108
Total	100	99	199

Chi-Squared Tests

	Value	df	p
X^2	95.131	1	< .001
N	199		

Odds Ratio

		95% Confidence Intervals		
	Odds Ratio	Lower	Upper	p
Odds ratio	32.000	14.442	70.904	
Fisher's exact test	31.170	13.614	77.648	< .001

Contingency Tables

	LabelSet3v2		
Raows	2	3	Total
0	15	88	103
1	85	11	96
Total	100	99	199

Chi-Squared Tests

	Value	df	p
X^2	108.777	1	< .001
N	199		

Odds Ratio

		95% Confidence Intervals		
	Odds Ratio	Lower	Upper	p
Odds ratio	0.022	0.010	0.051	
Fisher's exact test	0.023	0.009	0.054	< .001

Contingency Tables

	LabelSet3v2		
Kindbar	2	3	Total
0	17	93	110
1	83	6	89
Total	100	99	199

Chi-Squared Tests

	Value	df	p
X^2	119.125	1	< .001
N	199		

Odds Ratio

		95% Confidence Intervals		
	Odds Ratio	Lower	Upper	p
Odds ratio	0.013	0.005	0.035	
Fisher's exact test	0.014	0.004	0.037	< .001

Contingency Tables

	LabelSet3v2		
Progresso	2	3	Total
0	80	7	87
1	20	92	112
Total	100	99	199

Chi-Squared Tests

	Value	df	p
X^2	107.536	1	< .001
N	199		

Odds Ratio

		95% Confidence Intervals		
	Odds Ratio	Lower	Upper	p
Odds ratio	52.571	21.132	130.786	
Fisher's exact test	50.960	19.880	150.424	< .001

Contingency Tables

	LabelSet3v2		
Total	2	3	Total
0	18	95	113
1	82	4	86
Total	100	99	199

Chi-Squared Tests

	Value	df	p
X^2	123.211	1	< .001
N	199		

Odds Ratio

		95% Confidence Intervals		
	Odds Ratio	Lower	Upper	p
Odds ratio	0.009	0.003	0.028	
Fisher's exact test	0.010	0.002	0.030	< .001

Below are the full t-test results for the Ingredient List comparison:

Contingency Tables

Contingency Tables

	PlantersNutrition		
NutritionSe3v2	0	1	Total
2	6	86	92
3	74	33	107
Total	80	119	199

Chi-Squared Tests

	Value	df	p
X^2	80.733	1	< .001
N	199		

Odds Ratio

		95% Confidence Intervals		
	Odds Ratio	Lower	Upper	p
Odds ratio	0.031	0.012	0.078	
Fisher's exact test	0.032	0.010	0.082	< .001

Contingency Tables

	KindBarNutrition		
NutritionSe3v2	0	1	Total
2	83	9	92
3	9	98	107
Total	92	107	199

Chi-Squared Tests

	Value	df	p
X^2	133.176	1	< .001
N	199		

Odds Ratio

		95% Confidence Intervals		
	Odds Ratio	Lower	Upper	p
Odds ratio	100.420	38.102	264.661	
Fisher's exact test	95.373	35.030	296.394	< .001

Contingency Tables

	WillyWOnka		
NutritionSe3v2	0	1	Total
2	85	7	92
3	6	101	107
Total	91	108	199

Chi-Squared Tests

	Value	df	p
X^2	150.120	1	< .001
N	199		

Odds Ratio

		95% Confidence Intervals		
	Odds Ratio	Lower	Upper	p
Odds ratio	204.405	66.166	631.465	
Fisher's exact test	189.870	59.755	757.895	< .001

Contingency Tables

	ChefPierre

Odds Ratio

				95% Confidence Intervals		
		Odds Ratio		Lower	Upper	p

NutritionSe3v2	0	1	Total
2	56	36	92
3	3	104	107
Total	59	140	199

Chi-Squared Tests

	Value	df	p
X^2	79.962	1	< .001
N	199		

Odds Ratio

		95% Confidence Intervals		
	Odds Ratio	Lower	Upper	p
Odds ratio	53.926	15.892	182.981	
Fisher's exact test	52.702	15.656	277.614	< .001

Contingency Tables

	Rosarita_39		
NutritionSe3v2	0	1	Total
2	3	89	92
3	66	41	107
Total	69	130	199

Chi-Squared Tests

	Value	df	p
X^2	74.538	1	< .001
N	199		

Odds Ratio

		95% Confidence Intervals		
	Odds Ratio	Lower	Upper	p
Odds ratio	0.021	0.006	0.071	
Fisher's exact test	0.021	0.004	0.071	< .001

Contingency Tables

	Winco		
NutritionSe3v2	0	1	Total
2	4	88	92
3	101	6	107
Total	105	94	199

Chi-Squared Tests

	Value	df	p
X^2	160.925	1	< .001
N	199		

Odds Ratio

		95% Confidence Intervals		
	Odds Ratio	Lower	Upper	p
Odds ratio	0.003	0.001	0.010	
Fisher's exact test	0.003	0.001	0.011	< .001

Contingency Tables

	Gummyworms		
NutritionSe3v2	0	1	Total
2	7	85	92
3	73	34	107
Total	80	119	199

Chi-Squared Tests

	Value	df	p
X^2	75.606	1	< .001
N	199		

Odds Ratio

		95% Confidence Intervals		
	Odds Ratio	Lower	Upper	p
Odds ratio	0.038	0.016	0.092	
Fisher's exact test	0.039	0.014	0.096	< .001

Contingency Tables

	Cheerios		
NutritionSe3v2	0	1	Total
2	89	3	92
3	4	103	107
Total	93	106	199

Chi-Squared Tests

	Value	df	p
X^2	171.874	1	< .001
N	199		

Odds Ratio

		95% Confidence Intervals		
	Odds Ratio	Lower	Upper	p
Odds ratio	763.917	166.480	3505.341	
Fisher's exact test	671.402	143.882	6338.352	< .001

Below are the full frequency of results for the Individual Ingredients comparison:

Frequency Tables

Frequencies for Albumen

Albumen	Frequency	Percent	Valid Percent	Cumulative Percent
0	168	84.422	84.422	84.422
1	31	15.578	15.578	100.000
Missing	0	0.000		
Total	199	100.000		

Frequencies for Agar

Agar	Frequency	Percent	Valid Percent	Cumulative Percent
0	17	8.543	8.543	8.543
1	182	91.457	91.457	100.000
Missing	0	0.000		
Total	199	100.000		

Frequencies for Carrageenan

Carrageenan	Frequency	Percent	Valid Percent	Cumulative Percent
0	30	15.075	15.075	15.075
1	169	84.925	84.925	100.000
Missing	0	0.000		
Total	199	100.000		

Frequencies for Carmine

Carmine	Frequency	Percent	Valid Percent	Cumulative Percent
0	174	87.437	87.437	87.437
1	25	12.563	12.563	100.000
Missing	0	0.000		
Total	199	100.000		

Frequencies for Casien

Casien	Frequency	Percent	Valid Percent	Cumulative Percent
0	144	72.362	72.362	72.362
1	55	27.638	27.638	100.000
Missing	0	0.000		

Frequencies for Casien

Casien	Frequency	Percent	Valid Percent	Cumulative Percent
Total	199	100.000		

Frequencies for Cirtic Acid

Cirtic Acid	Frequency	Percent	Valid Percent	Cumulative Percent
1	199	100.000	100.000	100.000
Missing	0	0.000		
Total	199	100.000		

Frequencies for Gelatin

Gelatin	Frequency	Percent	Valid Percent	Cumulative Percent
0	53	26.633	26.633	26.633
1	146	73.367	73.367	100.000
Missing	0	0.000		
Total	199	100.000		

Frequencies for L-cysteine

L-cysteine	Frequency	Percent	Valid Percent	Cumulative Percent
0	189	94.975	94.975	94.975
1	10	5.025	5.025	100.000
Missing	0	0.000		
Total	199	100.000		

Frequencies for Omega-3

Omega-3	Frequency	Percent	Valid Percent	Cumulative Percent
0	68	34.171	34.171	34.171
1	131	65.829	65.829	100.000
Missing	0	0.000		
Total	199	100.000		

Frequencies for Lard

Lard	Frequency	Percent	Valid Percent	Cumulative Percent
0	40	20.101	20.101	20.101
1	159	79.899	79.899	100.000
Missing	0	0.000		
Total	199	100.000		

Frequencies for Lanolin

Lanolin	Frequency	Percent	Valid Percent	Cumulative Percent
0	154	77.387	77.387	77.387

Frequencies for Lanolin

Lanolin	Frequency	Percent	Valid Percent	Cumulative Percent
1	45	22.613	22.613	100.000
Missing	0	0.000		
Total	199	100.000		

Frequencies for Pepsin

Pepsin	Frequency	Percent	Valid Percent	Cumulative Percent
0	178	89.447	89.447	89.447
1	21	10.553	10.553	100.000
Missing	0	0.000		
Total	199	100.000		

Frequencies for Rennet

Rennet	Frequency	Percent	Valid Percent	Cumulative Percent
0	154	77.387	77.387	77.387
1	45	22.613	22.613	100.000
Missing	0	0.000		
Total	199	100.000		

Frequencies for Whey

Whey	Frequency	Percent	Valid Percent	Cumulative Percent
0	156	78.392	78.392	78.392
1	43	21.608	21.608	100.000
Missing	0	0.000		
Total	199	100.000		

Frequencies for Xantham Gum

Xantham Gum	Frequency	Percent	Valid Percent	Cumulative Percent
0	14	7.035	7.035	7.035
1	185	92.965	92.965	100.000
Missing	0	0.000		
Total	199	100.000		

Comparing Results Across Studies

A visual inspection of the data suggested that people were worse at identifying animal-based products in Study 2 compared to Study 1 for both the principal display panel and ingredients list tasks. One potential explanation for this is that when people are given disclosures for some products, they may assume that non-disclosed products do not have animal-derived ingredients when they really do, hence influencing their decisions. Of course, when disclosures are provided, people are very good at identifying that the product contains animals products. But perhaps Study 2 over-estimates the effect because of the methods we used. To help address this worry, we ran some supplemental analyses where we compared the same products principal display panels (i.e. English Muffin, Haribo, Rosarita, and Kind Bar) and ingredients list (i.e., Planters, Kind Bar, and Willy Wonka) that were common in both Studies 1 and 2. Since there were no disclosures in Study 1, the presence of disclosures for other products cannot influence responses. The results suggest that while there may be some effect of disclosures on the magnitude of the difference between disclosed and non-disclosed products, the size of that difference is small especially when compared to the very large effect of disclosures.

Here, there were two key contrasts. First, we contrasted the potential effect of disclosures on ratings of the same non-disclosed products between Studies 1 and 2. Second, we tested the differences between the non-disclosed product in Study 1 and the disclosed product in Study 2.

The first set of analyses compared the non-disclosed products from Studies 1 and 2 concerning the principal display panels (equivalent ORs from 1.96-2.91).

Contingency Tables

Contingency Tables

	EnglishMufin		
LabelSet3v2	**0**	**1**	**Total**
1	147	53	200
2	89	11	100
Total	236	64	300

Chi-Squared Tests

	Value	df	p
X^2	9.544	1	0.002
N	300		

Odds Ratio

		95% Confidence Intervals		
	Odds Ratio	**Lower**	**Upper**	**p**
Odds ratio	0.343	0.170	0.691	
Fisher's exact test	0.344	0.154	0.710	0.002

Odds Ratio

	Odds Ratio	95% Confidence Intervals		
		Lower	Upper	p

Contingency Tables

	Haribo		
LabelSet3v2	0	1	Total
1	109	91	200
2	70	30	100
Total	179	121	300

Chi-Squared Tests

	Value	df	p
X^2	6.655	1	0.010
N	300		

Odds Ratio

	Odds Ratio	95% Confidence Intervals		
		Lower	Upper	p
Odds ratio	0.513	0.308	0.855	
Fisher's exact test	0.514	0.297	0.879	0.012

Contingency Tables

	Rosarita		
LabelSet3v2	0	1	Total
1	134	66	200
2	80	20	100
Total	214	86	300

Chi-Squared Tests

	Value	df	p
X^2	5.510	1	0.019
N	300		

Odds Ratio

	Odds Ratio	95% Confidence Intervals		
		Lower	Upper	p
Odds ratio	0.508	0.287	0.899	
Fisher's exact test	0.509	0.271	0.925	0.021

Contingency Tables

Contingency Tables

	Kindbar		
LabelSet3v2	**0**	**1**	**Total**
1	168	32	200
3	93	6	99
Total	261	38	299

Chi-Squared Tests

	Value	df	p
X^2	5.897	1	0.015
N	299		

Odds Ratio

		95% Confidence Intervals		
	Odds Ratio	**Lower**	**Upper**	**p**
Odds ratio	0.339	0.137	0.840	
Fisher's exact test	0.340	0.112	0.864	0.016

We conducted similarly analyses for the Ingredient List Task. Equivalent ORs 1.76-2.3.

Contingency Tables

Contingency Tables

	PlantersNutrition		
NutritionSe3v2	**0**	**1**	**Total**
1	112	88	200
3	74	33	107
Total	186	121	307

Chi-Squared Tests

	Value	df	p
X^2	5.055	1	0.025
N	307		

Odds Ratio

		95% Confidence Intervals		
	Odds Ratio	**Lower**	**Upper**	**p**
Odds ratio	0.568	0.346	0.932	
Fisher's exact test	0.569	0.333	0.957	0.028

Contingency Tables

Contingency Tables

	KindBarNutrition		
NutritionSe3v2	**0**	**1**	**Total**
1	160	40	200
2	83	9	92
Total	243	49	292

Chi-Squared Tests

	Value	df	p
X^2	4.711	1	0.030
N	292		

Odds Ratio

		95% Confidence Intervals		
	Odds Ratio	**Lower**	**Upper**	**p**
Odds ratio	0.434	0.201	0.937	
Fisher's exact test	0.435	0.177	0.967	0.030

Contingency Tables

	WillyWOnka		
NutritionSe3v2	**0**	**1**	**Total**
1	173	27	200
2	85	7	92
Total	258	34	292

Chi-Squared Tests

	Value	df	p
X^2	2.126	1	0.145
N	292		

Odds Ratio

		95% Confidence Intervals		
	Odds Ratio	**Lower**	**Upper**	**p**
Odds ratio	0.528	0.221	1.261	
Fisher's exact test	0.529	0.187	1.310	0.172

The second set of analyses compared the non-disclosed products from Study 1 with the disclosed products from Study 2 for both the principal display panel task and the ingredients list task.

First, the results from the principal display panel task. ORs 8.67-25.63

Contingency Tables

Contingency Tables

	EnglishMufin		
LabelSet3v2	**0**	**1**	**Total**
1	147	53	200
3	24	75	99
Total	171	128	299

Chi-Squared Tests

	Value	df	p
X^2	65.626	1	< .001
N	299		

Odds Ratio

		95% Confidence Intervals		
	Odds Ratio	**Lower**	**Upper**	**p**
Odds ratio	8.667	4.967	15.124	
Fisher's exact test	8.593	4.808	15.799	< .001

Contingency Tables

	Haribo		
LabelSet3v2	**0**	**1**	**Total**
1	109	91	200
3	8	91	99
Total	117	182	299

Chi-Squared Tests

	Value	df	p
X^2	59.907	1	< .001
N	299		

Odds Ratio

		95% Confidence Intervals		
	Odds Ratio	**Lower**	**Upper**	**p**
Odds ratio	13.625	6.280	29.560	
Fisher's exact test	13.509	6.143	33.983	< .001

Contingency Tables

Odds Ratio

			95% Confidence Intervals		
	Odds Ratio		Lower	Upper	p

	Rosarita		
LabelSet3v2	0	1	Total
1	134	66	200
3	11	88	99
Total	145	154	299

Chi-Squared Tests

	Value	df	p
X^2	82.813	1	< .001
N	299		

Odds Ratio

		95% Confidence Intervals		
	Odds Ratio	Lower	Upper	p
Odds ratio	16.242	8.125	32.468	
Fisher's exact test	16.074	7.891	35.727	< .001

Contingency Tables

Contingency Tables

	Kindbar		
LabelSet3v2	0	1	Total
1	168	32	200
2	17	83	100
Total	185	115	300

Chi-Squared Tests

	Value	df	p
X^2	126.599	1	< .001
N	300		

Odds Ratio

		95% Confidence Intervals		
	Odds Ratio	Lower	Upper	p
Odds ratio	25.632	13.457	48.822	
Fisher's exact test	25.217	12.907	51.734	< .001

Next the results from the ingredients list task. ORs 18.24-107.86.

Contingency Tables

Contingency Tables

	KindBarNutrition		
NutritionSe3v2	**0**	**1**	**Total**
1	160	40	200
3	9	98	107
Total	169	138	307

Chi-Squared Tests

	Value	df	p
X^2	144.370	1	< .001
N	307		

Odds Ratio

		95% Confidence Intervals		
	Odds Ratio	**Lower**	**Upper**	**p**
Odds ratio	43.556	20.257	93.653	
Fisher's exact test	42.774	19.537	104.756	< .001

Contingency Tables

	WillyWOnka		
NutritionSe3v2	**0**	**1**	**Total**
1	173	27	200
3	6	101	107
Total	179	128	307

Chi-Squared Tests

	Value	df	p
X^2	187.632	1	< .001
N	307		

Odds Ratio

		95% Confidence Intervals		
	Odds Ratio	**Lower**	**Upper**	**p**
Odds ratio	107.858	43.069	270.111	
Fisher's exact test	104.782	41.269	322.125	< .001

Contingency Tables

Contingency Tables

	PlantersNutrition		
NutritionSe3v2	**0**	**1**	**Total**
1	112	88	200
2	6	86	92
Total	118	174	292

Chi-Squared Tests

	Value	df	p
X^2	64.062	1	< .001
N	292		

Odds Ratio

		95% Confidence Intervals		
	Odds Ratio	**Lower**	**Upper**	**p**
Odds ratio	18.242	7.617	43.692	
Fisher's exact test	18.082	7.490	52.986	< .001

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