



Attitudes toward beef and vegetarians in Argentina, Brazil, France, and the USA



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ABSTRACT

Meat is both the most favored and most tabooed food in the world. In the developed world, there is a tension between its high nutritional density, preferred taste, and high status on the one hand, and concerns about weight, degenerative diseases, the ethics of killing animals, and the environmental cost of meat production on the other hand. The present study investigated attitudes toward beef, and toward vegetarians, among college students in Argentina, Brazil, France, and the USA. Across countries, men were more pro-beef, in free associations, liking, craving, and frequency of consumption. By country, Brazil and Argentina were generally the most positive, followed by France and then the United States. Ambivalence to beef was higher in women, and highest in Brazil. Only Brazilian and American women reported frequent negative associations to beef (e.g. “disgusting”, “fatty”). Overall, most students had positive attitudes to beef, and the attitude to vegetarians was generally neutral. America and Brazilian women showed some admiration for vegetarians, while only French men and women had negative attitudes to vegetarians. In spite of frequent negative ethical, health, and weight concerns, in the majority of the sample, liking for and consumption of beef was maintained at a high level.

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1. Introduction

In the developed world, many people have ambivalent attitudes toward meat. As a concentrated source of protein, fat, and minerals, meat usually occupies a favored position in the hierarchy of foods (e.g., Adams, 1990; Allen & Ng, 2003; Rozin, Hormes, Faith, & Wansink, 2012; Twigg, 1979), and in many societies, the ability to consume large amounts of meat has traditionally been a marker of wealth and social power (e.g., Fiddes, 1991). Twigg (1979) argues that in many cultural contexts, neither all food nor all meats are created equal—red meat is at the top of the pile, followed by white meat, fish, dairy, eggs, and at the very bottom, fruits and vegetables. Red meat is thought to occupy this position in the food hierarchy because it symbolizes power, strength, and human dominance over nature through its visible blood content and associations with

hunting, a typically male-dominated activity (e.g., Adams, 1990; Fiddes, 1991; Sobal, 2005).

Although meat is held in such high regard in most societies, animal flesh is more likely than vegetable matter to contain harmful bacteria and parasites (Schantz & McAuley, 1991), and it is also the most frequently tabooed category of food (e.g., Fessler & Navarrete, 2003; Rozin, 1987; Simoons, 1994). In many Western societies, ambivalence toward eating commonly consumed animals appears to be driven by several other factors. One such source of conflict (and contention) is concern about the effects of high meat consumption on health. On the one hand, on a country level, meat consumption is positively related to longevity, as nine of the ten most long-lived countries in the world eat a diet high in meat (the exception being Japan, FAOSTAT, 2014), but on the other hand, within developed countries and controlling for various potential confounds, such as socioeconomic status, access to healthcare, smoking, and exercise, many researchers have demonstrated a relationship between meat consumption (particularly processed red meat), and increased mortality, especially due to heart disease

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(e.g., Fraser, 1999; Huang, Yang, Li, Wahlqvist, & Li, 2012; Micha, Wallace, & Mozaffarian, 2010; Pan et al., 2012; Rohrmann et al., 2013). As such, for many people, there is a tension between the pleasure of eating meat and concern about one's health (e.g., Becker, Kals, & Fröhlich, 2004; Povey, Wellens, & Conner, 2001; Sparks, Conner, James, Sheperd, & Povey, 2001). Other major sources of concern about meat eating focus on the ethics of raising and killing animals for human consumption, the environmental impact of meat production, and, to a lesser but significant extent, matters of taste and expense (e.g., Audebert, Deiss, & Rousset, 2006; Berndsen & van der Plight, 2004; Richardson, Shepherd, & Elliman, 1993; Rousset, Deiss, Juillard, Schlich, & Droit-Volet, 2005; Ruby, 2012; Ruby, Heine, Kamble, Cheng, & Waddar, 2013; Singer, 1976; Steinfeld et al., 2006).

Presently, we are in the peculiar position that meat, a generally favored and high-status human food, may be declining in popularity in the developed world because of health, environmental, and ethical concerns, while its popularity is increasing in the much larger developing world, as these countries become more affluent (e.g., Larsen, 2012; OECD-FAO, 2014).

1.1. Attitudes toward vegetarians

In accordance with meat ambivalence, a modest percentage of people in the world are vegetarians. There is not a widely accepted definition of vegetarianism, and figures for the incidence of vegetarianism are not available for many countries. Almost certainly, India has the highest percentage of vegetarians, with estimates ranging from 20 to 42% (see Ruby, 2012 for a review). In the four countries of interest in the present study, estimated prevalence of vegetarianism, defined as complete avoidance of meat (that is, animal flesh) ranges from 8% in Brazil (Ibope, 2012), 5% in the USA (Gallup, 2012), and less than 2% in France (European Vegetarian Union, 2007). There is no available official estimate for Argentina, the world leader for beef consumption per capita, but the Argentina Society of Nutrition estimates a prevalence of 1–2% (Bianco, 2014).

Research on attitudes toward vegetarians is relatively scarce, and comes primarily from the United States and Canada. In the first study measuring perceptions of vegetarians, Sadalla and Burroughs (1986) found that US-Americans viewed vegetarians as being pacifist, hypochondriacal, liberal, weight-conscious, and recreational drug-users. When asking vegetarians how they saw themselves, a similar schema emerged, in that they perceived themselves to be intellectual, non-competitive, weight-conscious and sexy, with a tendency to use recreational drugs. More recently, in a sample of university students in the southeast United States, Chin, Fisak, and Sims (2002) found that attitudes toward vegetarians were generally positive, with the caveat that their sample was mostly female (81%) and liberal (65%), echoing the results of Walker (1995), who found that female teenagers in the USA held more positive attitudes toward vegetarians than did their male peers.

In yet another study conducted in the USA, Rozin et al. (2012) found that participants rated targets whose favorite foods were “vegetable stir fry and other vegetable dishes” as less masculine and more feminine than targets whose favorite foods were “steak and other kinds of beef”, and in both Canadian and US-American samples, Ruby and Heine (2011) found that, after controlling for perceived healthiness of diet, people perceived vegetarians to be more moral and less masculine than omnivores. In another a sample of students in the USA, Minson and Monin (2012) found that omnivores viewed vegetarians as virtuous but weak; furthermore, the extent to which they anticipated moral reproach from vegetarians predicted how much they derogated them (i.e., rating of weakness).

A recent set of studies by Rothgerber (2014) indicates that simply reading about vegetarians can trigger a sense of guilt and dissonance in some meat eaters, leading them to engage in a series of dissonance reduction strategies, such as demoralizing commonly eaten animals, denying animals' capacity for pain, and more strongly justifying their meat consumption. Paradoxically, reading about a dedicated vegetarian (who never eats meat or fish, as opposed to an imposter who claims to be vegetarian but frequently eats meat and fish) led participants to report less frequent beef consumption, and more frequent consumption of vegetarian meals—suggesting that they may have distorted their reports in an attempt to feel better about their dietary choices, as simply reading a vignette could not possibly have affected people's actual past eating behavior.

Attitudes toward vegetarians in Brazil, Argentina, and France have not been examined, to our knowledge, but on the basis of government regulations that recently required all public school lunches to contain animal products, with a minimum of 20% of meals containing meat and 20% containing fish, and the remainder containing egg, cheese, or offal, it appears that France (French law) is unsympathetic to vegetarians (e.g., Haurant, 2011). Given the importance of beef in Brazil and Argentina, and the structural opposition to people following vegetarian diets in France, laypeople's attitudes toward vegetarians in these cultural contexts remains an important and underexplored topic.

1.2. Gender and meat

In many Western societies, vegetarian women greatly outnumber vegetarian men (e.g., Amato & Partridge, 1989; Fraser, Welch, Luben, Bingham, & Day, 2000; Santos & Booth, 1996; Worsley & Skrzypiec, 1998) and even among Western non-vegetarians, women eat considerably less meat than men (e.g., Beardsworth et al., 2002; Fraser et al., 2000; Gossard & York, 2003; National Public Health Institute, 1998; Richardson et al., 1993; Rimal, 2002). In many cultural contexts, there are also large gender differences in attitudes toward meat. Compared to their female peers, men in England (Beardsworth et al., 2002) and Norway (Fagerli & Wandel, 1999) are more likely to believe that a healthy diet should always include meat. When justifying their consumption of meat, Rothgerber (2013) found that American women were more likely to use indirect methods (e.g., dissociating meat from its animal origins, avoiding thinking about animal slaughter), whereas men were more likely to use direct methods (e.g., claims that meat is necessary for good health, appeals to taste, human dominance over nature).

Among a sample of American college students, Mooney and Walbourn (2001) found that meat is the most commonly avoided food among female participants, and in another sample of American college students, Rozin et al. (2012) found that women were more likely than men to avoid eating red meat. Echoing many previous arguments about the special status of red meat (e.g., Adams, 1990; Twigg, 1979; Fiddes, 1991), Rousset et al. (2005) maintain that, generally speaking, “men feel hedonic pleasure in seeing and eating red meat while women experience discomfort” (p. 609). Support for this statement comes from several sources. Kubberød, Ueland, ødbotten, Westad and Risvik (2002) found that among Norwegian university students, women had more negative attitudes to red meat than did men, and looking at a range of different meats, women disliked meats more the redder and “meatier” they were (e.g., beef, lamb). In this study, and another study of Norwegian high school students (Kubberød, Ueland, Tronstad & Risvik, 2002), the sight of blood in red meat especially invoked images of animal death and disgust in women, with similar results emerging in a sample of teenage girls in England (Kenyon &

Barker, 1998), and in random samples of adults from the USA, UK, France, Germany, Italy, and Switzerland (Ruby, Rozin, & Fischler, in preparation).

The perceived (un)healthiness of meat appears to be another important source of ambivalence. Macht, Gerer, and Ellgring (2003) found that German women were more likely to view energy-dense foods as unhealthy and dangerous, and research with Danish (Holm & Møhl, 2000) and South Australian (Lea & Worsley, 2002) samples reveals people's tendency to view meat as fatty and calorically dense is an important factor in their rejection. Among a sample of adult French women, Audebert et al. (2006) found that enjoyment of red meat was positively correlated with beliefs that meat was essential to a balanced diet and good health, and negatively correlated with concern for animal breeding/slaughter practices and the impact of meat on the environment, and Leeman, Fischler, Rozin, and Shields (2011) report more favorable attitudes to the healthiness of meat in continental European than American physicians. As with general attitudes toward beef, and attitudes toward vegetarianism, little is known about possible gender differences in how people relate to meat in South America.

1.3. Research questions

We elected to look at the place of beef in life as a function of gender and culture. We selected beef because, in the Western world, it is the quintessential mammal meat. In the path to vegetarianism, beef is often the first animal product to be removed from the diet (e.g., Beardsworth & Keil, 1991, 1992; Santos & Booth, 1996). In particular, beef is the most commonly consumed mammal meat in Argentina, Brazil, France, and the USA. Well known for its *asado* (barbecue), Argentina is (among countries of 5 million or more people), the highest consumer of beef in the world, at an estimated consumption of 54.9 kg per capita in 2011 (FAOSTAT, 2014). That year, Brazil's estimate was 39.1 kg (3rd in the world), the USA consumed 37.0 kg (4th in the world), and France consumed 25.4 kg (10th in the world; FAOSTAT, 2014). These four countries are among the highest producers of beef— as of 2011, the USA produced the most beef in the world (12.0 billion tons), followed by Brazil (#2; 9.0 billion tons), Argentina (#5, 2.5 billion tons) and France (#8, 1.6 billion tons).

Despite its culinary and economic importance, little is known about how people relate to beef in major beef-consuming countries, such as Argentina and Brazil. There is little research on the psychology of beef in non-Western countries, and virtually none in South American countries. Beef consumption and attitudes to beef are of particular relevance because of increasing concerns in the developed world about the effects of red meat consumption on health, animal welfare, and environmental sustainability. Gender is of special interest because it is well documented that in the developed world, women have greater concerns about animal welfare, the health effects of diet, and body weight. Beef and other red meats are often high in fat, and hence high in caloric density. Thus, high liking for beef could create challenges for those concerned about maintaining a lower weight. Finally, with food playing an especially important role in French culture, and beef as the “central” food in Argentina, there are interesting questions about how health and ethical concerns about beef impact beef attitudes in these cultures. How does cultural centrality interact with the greater tendency of women, as opposed to men to be concerned about animal welfare, health, and body weight? Does the centrality of beef in Argentina and food in general in France (Rozin, Fischler, Imada, Sarubin, & Wrzesniewski, 1999) reduce these concerns? Furthermore, one might expect that countries with a greater focus on beef (or meat in general) might be more hostile to those who reject these focal foods (vegetarians). In the present study, we

assessed beef attitudes with free associations to “beef”, liking, desire to eat, and consumption of beef, as well as attitudes toward vegetarians, among university students in Brazil, Argentina, France, and the USA. Given the relative lack of prior research in this domain, we conducted the study in an exploratory fashion, without explicit hypotheses.

2. Method

2.1. Participants

From late 2010 to 2012, as part of a larger study on attitudes toward food, exercise, and the body, we recruited a total of 1695 participants from universities in four countries to take part in “a survey on body image and attitudes toward food and physical activity.”

304 participants were students from the University of Buenos Aires in Argentina (84% women, $M_{age} = 23.6$, $SD_{age} = 2.89$; 3.0% vegetarian/vegan), and were informed of the study through advertisements in psychology and anthropology classes, and via a post on the Facebook page of the university's psychology group, which was accompanied by a request for students to share the post. 583 participants were students from the University of São Paulo in Brazil (62% women, $M_{age} = 21.3$, $SD_{age} = 2.46$; 3.9% vegetarian/vegan), and were informed of the study via an email sent through the university's academic listservs. 441 participants were students from the Université de Nantes in France (62% women, $M_{age} = 21.6$, $SD_{age} = 1.46$; .2% vegetarian/vegan), and were informed of the study via an email sent to all students of the Audencia Nantes School of Management. The remaining 367 participants were students from the University of Pennsylvania (UPenn) in the USA (65% women, $M_{age} = 21.5$, $SD_{age} = 3.21$; 5.2% vegetarian/vegan), and were informed of the study via announcements in introductory and social psychology courses, and via an email to all graduate students at the university. All participants completed the survey on a voluntary basis; in keeping with local norms, undergraduate students at UPenn received course credit for their participation, and graduate students at UPenn were entered into a cash lottery with a \$100 award to the winner. The US sample was intentionally collected from both graduates and undergraduates for two reasons: 1) In the US, many undergraduates live in dormitories, and we wanted a good representation of US students living off campus, as is the case in the other countries; 2) US undergraduates are somewhat younger than undergraduates from the other countries.

To guard against careless responding and to ensure more representative cross-cultural comparisons, we systematically excluded data from any participants who had either left more than 30% of the questionnaire blank (Argentina: 42, Brazil: 95, France: 67, USA: 13), were outside the age range of 18–30, or who did not specify their age (Argentina: 55, Brazil: 50, France: 6, USA: 43), did not specify their gender (Argentina: 19, Brazil: 1, France: 0, USA: 9), or were born outside of their university's country or had lived the majority of their life since age 10 outside of said country (Argentina: 5, Brazil: 2, France: 18, USA: 64).

2.2. Materials

An initial questionnaire was developed in English and pilot-tested with university students in the USA. The questionnaire was then translated by native speakers of the relevant languages into Brazilian Portuguese, Argentine Spanish, and French. Back translation into English was done by a different set of bilingual translators, and discrepancies were resolved via discussion between the translators.

The measures of relevance to this study assessed participant

attitudes toward beef and toward vegetarians, and the relation of these measures to demographic variables. Other measures, not included in this report, explored body image, portion size, and general attitudes toward food, eating, and exercise. The questionnaire was hosted on SurveyMonkey.com.

To assess attitudes toward beef, participants were asked to write down the first three words that come to mind when they think of beef (or *carne vermelha*, *carne*, or *boeuf* in Brazilian Portuguese, Argentine Spanish, and French, respectively). This was the second item of the questionnaire, the first being a free association to the word “chocolate”, in order to obtain participants' spontaneous responses without potential interference from other questionnaire items, and without immediately indicating our focused interest on beef. After completing the free associations, participants were asked to assign each word a positive, negative, or neutral value (+1, 0, or -1, respectively).

Next, participants indicated how much they liked beef, on a scale of 0 (not at all) to 100 (one of your favorite foods in the world), and to indicate how often they have such a strong desire for beef that they go out of their way to obtain it (1 = never, 2 = once/twice, 3 = occasionally, 4 = often, 5 = almost daily). To assess beef consumption, participants were asked to indicate how many times a month they eat beef.

To assess attitudes toward vegetarians, participants indicated, on a seven-point scale (1 = disagree strongly, 4, neither agree nor disagree, 7 = agree strongly), their agreement/disagreement with the following items: “I admire vegetarians”, “Vegetarians bother me”, and “I would prefer to date a vegetarian”. To facilitate interpretation of results, we recoded these data to the metric of (-3 = disagree strongly, 0 = neither agree nor disagree, 3 = agree strongly).

At the end of the survey, participants provided a range of demographic data.

2.3. Data analysis

For the qualitative data, we calculated the frequency of the words that came to mind when participants were prompted to free associate to the word “beef”, using the first association for each participant. We list the top 10 free associations by gender and group in [Table 1](#), using a cutoff of words that were reported by 3 or more participants. This strategy shortens the list for Argentine men, which was by far the smallest group. The list represents close to raw associations; we only combined clearly similar words (e.g., fat, fatty; burger, hamburger; delicious, good, tasty; bad, gross, yuck, disgusting; corpse, death, dead).

For the quantitative data, to provide a quick overview of each set of results, and to help mitigate the gender imbalance in the Argentine sample (84% women, vs. 62–65% women in the other three cultures), for each measure we: 1) describe the two highest and lowest groups; 2) analyze the data via a series of one-way logistic regressions (for binary outcomes) or ANOVAs using Type I sums of squares (for non-binary outcomes). As our group sizes were unequal and their variances were heterogeneous, to test the significance of country-level differences within each gender, we used the Games-Howell post-hoc test. Finally, we examine the correlations between all of our outcome variables.

3. Results

3.1. Free associations to ‘beef’

The most frequent words (measured in terms of number of groups for which they appeared in the top 10) were tasty/good (all 8 groups); cow (7 groups), fat, juicy, red, and steak (5 groups).

Blood, barbeque, disgusting/bad, and meat were present in 4 groups.

Most common in both Brazil and Argentina was barbecue (asado, churrasco). In both of these countries, this carries the implication of socializing and sharing the meal with others. The most common word in France was meat (*viande*), followed by steak, and the most common word in USA was cow, followed by meat.

The French list seems most different from the others: The word “disgusting/bad” was in the top 10 for all female groups except France, and references to “fat/fatty” were absent only from the French list ([Table 1](#)). If we classify “fat/fatty”, “death/violence”, and “disgusting/bad” as the only clearly negative words (“blood” is questionable), France is the only country in which no negative words appeared in the top 10.

3.2. Ambivalence toward beef

We categorized participants into four mutually exclusive groups on the basis of the values they assigned to each of their three free associations: 1) *Ambivalent*— Provided at least one negative and one positive value; 2) *Positive*— Provided at least one positive, and NO negative values; 3) *Negative*— Provided at least one negative, and NO positive value; 4) *Neutral*: Provided only neutral values. We also summed the values for the three words to create a general beef valence score.

Beef ambivalence was most common in Brazilian women (42.5%) and men (29.6%), and least common in Argentine (14.0%) and American (18.6%) men.

We ran a series of binomial logistic regressions of gender (Woman 0/Man 1) within each culture, predicting ambivalence in spontaneous associations with beef (No = 0, Yes = 1). The regressions revealed that women were more likely than men to hold ambivalent attitudes to beef in Brazil [$B = .56$, $Wald(1) = 9.68$, $p < .01$], but not in Argentina, [$B = .71$, $Wald(1) = 2.66$, $p = .10$], France [$B = .10$, $Wald(1) = .17$, $p = .68$], or the USA [$B = .30$, $Wald(1) = 1.19$, $p = .28$].

Next, we ran a logistic regression within each gender, examining the effect of culture with dummy codes for each culture. Ambivalence was more prevalent among Brazilian women than among Argentine [$B = .81$, $Wald(1) = 20.05$, $p < .001$], French [$B = 1.04$, $Wald(1) = 31.93$, $p < .001$], and American women [$B = .88$, $Wald(1) = 22.12$, $p < .001$]. The same pattern also emerged among men, such that ambivalence was more prevalent among Brazilian men than among Argentine [$B = .95$, $Wald(1) = 4.80$, $p < .03$], French [$B = .57$, $Wald(1) = 5.46$, $p < .02$], and American men [$B = .61$, $Wald(1) = 5.11$, $p < .03$] (See [Table 2](#)).

3.3. Positivity toward beef

Beef positivity was most common in Argentine (82.0%) and French (71.9%) men, and least common in Brazilian (40.0%) and American women (44.1%).

A series of logistic regressions revealed that men were more likely than women to hold positive attitudes to beef in Argentina [$B = 1.20$, $Wald(1) = 9.48$, $p < .01$], Brazil, [$B = .63$, $Wald(1) = 13.37$, $p < .001$], France [$B = .57$, $Wald(1) = 7.22$, $p < .01$], and the USA [$B = .79$, $Wald(1) = 12.45$, $p < .001$] (see [Table 2](#)).

Positivity was more prevalent among French women than among Brazilian [$B = .78$, $Wald(1) = 20.49$, $p < .001$], and American women [$B = .61$, $Wald(1) = 11.41$, $p < .001$], and also more positive among Argentine women than among Brazilian [$B = .72$, $Wald(1) = 18.86$, $p < .001$], and American women [$B = .55$, $Wald(1) = 9.25$, $p < .01$]. A similar pattern also emerged among men, such that positivity was more prevalent among French men

Table 1
Free associations to “beef”.

Rank	Argentina		Brazil		France		USA	
	Women	Men	Women	Men	Women	Men	Women	Men
1	Asado (BBQ) 36	Asado (BBQ) 17	Gostosa/Saborosa/Bom (Tasty) 66	Churrasco (BBQ) 39	Viande (Meat) 128	Viande (Meat) 68	Cow 52	Cow 27
2	Rojo (Red) 31	Rico/Gostoso (Tasty) 7	Churrasco (BBQ) 64	Gostosa/Saborosa/Bom (Tasty) 30	Steak (Steak) 23	Steak (Steak) 25	Meat 24	Steak 18
3	Rico/Gostoso (Tasty) 29	Vaca (Cow) 5	Sangue (Blood) 43	Sangue (Blood) 25	Rouge (Red) 22	Vache (Cow) 17	Hamburger 22	Meat 15
4	Comida (Food) 19	Grasa/Grasosa (Fat/ty) 3	Suculenta (Juicy) 18	Proteína (Protein) 17	Vache (Cow) 20	Sang/Saignant (Blood/ y) 8	Eww/Gross/ Yuck 19	Hamburger 7
5	Jugoso (Juicy) 12	Jugoso (Juicy) 3	Nojo/Ruim (Disgust/ Bad) 18	Vaca/Boi (Cow/Ox) 15	Animal (Animal) 12	Rouge (Red) 5	Red 18	Red 7
6	Animal(es) Animal(s) 9	Milanesa (Cutlet) 3	Gordura/Gordurosa (Fat/Fatty) 16	Picanha (Steak) 11	Sang/Saignant (Blood/y) 11	Côte (Rib) 4	Steak 15	Protein 5
7	Asco (Disgusting) 9	–	Proteína (Protein) 14	Suculenta (Juicy) 10	Bourguignon (Bourguignon) 7	Délicieux/Miam (Delicious/Yum) 4	Tasty/ Delicious/ Good 12	Tasty/ Delicious/ Good 4
8	Nutritiva/Sana (Nutritious/Healthy) 9	–	Vaca/Boi (Cow/Ox) 12	Bife (Beef) 5	Bon/Miam (Good/ Yum) 6	Bourguignon (Bourguignon) 3	Fat/Fatty 10	Fat/Fatty 4
9	Proteinas (Protein) 9	–	Picanha (Steak) 9	Gordura/Gordurosa (Fat/Fatty) 4	Oeuf (Egg) 4	Gros (Big) 3	Juicy/Saucy 6	Jerky 3
10	Sangre (Blood) 7 Milanesa (Cutlet) 7	–	Morte/Violencia (Death/Violence) 8	Morte/Violencia (Death/Violence) 4	Hamburger (Hamburger) 3	–	Food 4 Jerky 4	Savory 3

Table 2
Percent of people with ambivalent, positive, and negative free associations to “beef”.

Gender	Country	N	Ambivalent	Positive	Negative
Women	Argentina	254	24.8 b	57.9 a*	15.7 b*
	Brazil	360	42.5 a*	40.0 b*	16.4 b
	France	274	20.8 b	59.1 a*	14.6 b*
	USA	367	23.5 b	44.1 b*	25.2 a*
Men	Argentina	50	14.0 b	82.0 a*	4.0 b*
	Brazil	223	29.6 a*	55.6 c*	14.3 ab
	France	167	19.2 b	71.9 ab*	6.0 bc*
	USA	129	18.6 b	63.6 bc*	7.8 b*

Note: Comparing across gender within country, percentages marked with a * differ at $p < .05$ or lower. Comparing across countries within gender, percentages that do not share subscripts differ at $p < .05$ or lower.

than Brazilian [$B = .71$, $Wald(1) = 10.61$, $p < .001$], and also more positive among Argentine men than among Brazilian [$B = 1.29$, $Wald(1) = 10.85$, $p < .001$], and American men [$B = .96$, $Wald(1) = 5.45$, $p < .02$].

3.4. Negativity toward beef

Beef negativity was most common in American (25.2%) and Brazilian (16.4%) women, and least common in Argentine (4.0%) and French men (6.0%).

A series of logistic regressions revealed that women were more likely than men to hold negative attitudes to beef in Argentina [$B = 1.50$, $Wald(1) = 4.09$, $p < .05$], France, [$B = .99$, $Wald(1) = 7.19$, $p < .01$], and the USA [$B = 1.39$, $Wald(1) = 14.77$, $p < .001$], but not Brazil [$B = .16$, $Wald(1) = .43$, $p = .51$].

Negativity was more prevalent among American women than among Argentine [$B = .59$, $Wald(1) = 6.69$, $p < .01$], Brazilian [$B = .54$, $Wald(1) = 6.90$, $p < .01$], and French women [$B = .68$, $Wald(1) = 8.94$, $p < .01$]. Among men, negativity was more

prevalent among Brazilian men than French men [$B = .97$, $Wald(1) = 6.55$, $p < .02$] (See Table 2.).

3.5. Neutrality toward beef

Neutral attitudes constitute the remainder after assigning positivity, negativity and ambivalence, and were well below the levels for negative and positive associations, with the range only 0–10.1% across all eight groups (see Table 2).

3.6. Valence of associations toward beef

For the valence measure, the maximum positive score is 3.0 (3 positive associations) and the minimum negative score is –3.0 (3 negative associations). Argentine (2.04) and French men (1.56) were most positive toward beef, and American (.46) and Brazilian (.69) women were least positive.

A two-way (Gender \times Country) ANOVA revealed a significant effect of gender, such that men had significantly more positive associations to beef than did women, $F(1, 1687)$, = 42.68, $p < .001$, $d = .67$. The effect of country was also significant, $F(3, 1687) = 10.42$, $p < .001$, such that valence was significantly higher in Argentina and France than in the USA and Brazil. The interaction of gender and country was not significant, $F(3, 1687) = 1.32$, $p = .27$. For a comprehensive overview of all means and significant differences for this and all subsequent quantitative measures, see Table 3.

3.7. Liking of beef

Liking of beef (0–100 scale) was highest in French (77.88) and Argentine men (77.32), and lowest in American (48.70) and Brazilian (58.27) women.

A two-way (Gender \times Country) ANOVA revealed a significant

Table 3
Attitudes toward beef, beef intake, and attitudes toward vegetarians (means and standard deviations).

Gender	Country	N	Beef Valence	Beef liking	Beef desire	Beef consumption (times/month)	Admire vegetarians	Bothered by vegetarians	Not date vegetarians
Entire Sample	Argentina	304	1.24 (1.71) a	61.69 (26.31) b	1.47 (.81) b	19.36 (14.13) b	-.22 (1.30) b	-2.07 (1.45) c	-1.48 (1.67) c
	Brazil	583	.86 (1.86) b	63.08 (29.11) b	1.53 (.86) b	22.61 (15.74) a	.38 (1.87) a	-1.60 (1.76) b	-.79 (2.09) b
	France	441	1.19 (1.55) a	67.79 (23.71) a	1.79 (.94) a	11.30 (10.25) c	-1.47 (1.61) c	-1.67 (1.57) b	-.10 (2.06) a
	USA	367	.74 (1.70) b	55.56 (30.04) c	1.70 (.86) a	8.54 (9.81) d	.30 (1.64) a	-1.18 (1.58) a	-.13 (1.88) a
Women	Argentina	254	1.08 (1.77)	58.58 (26.29)	1.43 (.80)	19.29 (14.83)	-.13 (1.21)	-2.08 (1.45)	-1.53 (1.68)
	Brazil	360	.69 (1.85)	58.27 (29.51)	1.48 (.81)	20.70 (15.21)	.62 (1.79)	-1.71 (1.68)	-.79 (2.11)
	France	274	.97 (1.60)	61.64 (25.27)	1.69 (.87)	9.03 (7.50)	-1.35 (1.64)	-1.91 (1.41)	-.17 (2.13)
	USA	367	.46 (1.75)	48.70 (30.13)	1.58 (.76)	5.97 (6.74)	.56 (1.55)	-1.42 (1.53)	-.22 (1.88)
Men	Argentina	50	2.04 (1.11)	77.32 (17.49)	1.66 (.84)	19.71 (9.95)	-.74 (1.59)	-1.98 (1.42)	-1.20 (1.62)
	Brazil	223	1.14 (1.86)	70.80 (26.77)	1.62 (.94)	25.68 (16.13)	-.01 (1.92)	-1.43 (1.86)	-.77 (2.07)
	France	167	1.56 (1.40)	77.88 (16.58)	1.96 (1.02)	15.00 (12.77)	-1.68 (1.55)	-1.29 (1.73)	.02 (1.96)
	USA	129	1.26 (1.48)	68.22 (25.49)	1.93 (.99)	13.32 (12.51)	-.19 (1.70)	-.74 (1.58)	.05 (1.65)

Note: For all variables, was a significant gender difference at $p < .05$ or lower, such that men were more positive toward meat, and less positive toward vegetarians. Country-level means that do not share subscripts differ at $p < .05$ or lower.

effect of gender, such that men liked beef significantly more than did women, $F(1, 1682) = 133.13, p < .001, d = .59$. The effect of country was also significant, $F(3, 1682) = 13.96, p < .001$, such that liking was greatest in France and Argentina, followed by Brazil, then the USA. The interaction of gender and country was not significant, $F(3, 1682) = 1.42, p = .23$.

3.8. Desire to eat beef

Desire to eat beef was most frequent in French (1.96) and American (1.93) men, and least frequent in Argentine (1.43) and Brazilian women (1.48).

There was a significant effect of gender, such that men desired beef significantly more often than did women, $F(1, 1687) = 31.52, p < .001, d = .35$. The effect of country was also significant, $F(3, 1687) = 10.30, p < .001$, such that desire was significantly less in Brazil and Argentina than in the USA and France. The interaction of gender and country was not significant, $F(3, 1687) = 1.07, p = .36$.¹ We note a mismatch between liking, relatively high in Argentines, and desire, below average in Argentines.

3.9. Beef consumption

Frequency of beef consumption (times per month) was highest among Brazilian (25.68) and Argentine (19.71) men, and lowest among American (5.97) and French (9.03) women.

There was a significant effect of gender, such that men consumed beef significantly more often than did women, $F(1, 1684) = 53.17, p < .001, d = .34$. The effect of country was also significant, $F(3, 1684) = 123.27, p < .001$, such that consumption was highest in Brazil, followed by Argentina, then the USA, and finally France, with every country significantly different from the other. The main effects were qualified by a significant interaction of gender and country, $F(3, 1684) = 2.88, p < .04$. Analysis of simple effects revealed that men ate beef significantly more frequently than did women in Brazil [$F(1, 581) = 14.08, p < .001, d = .32$], France [$F(1, 437) = 38.02, p < .001, d = .61$], and the USA [$F(1, 364) = 53.50, p < .001, d = .80$], but not in Argentina [$F(1, 302) = .04, p = .85, d = .03$].

¹ Because the differences between the levels of desire to eat beef are not equal, these data are technically ordinal, not ratio. Although many researchers perform ANOVAs on ordinal data, one should technically use nonparametric statistics. If we instead analyzed these data with a Kruskal–Wallis H Test, our inferences remain largely unchanged, save that the gender difference within the Argentine sample becomes significant.

3.10. Admiration of vegetarians

Admiration of vegetarians was highest in Brazilian (.62) and American (.56) women, and lowest in French men (-1.68) and women (-1.35). Notably, only the top two groups had a mean score above neutral, indicating that participants did not particularly admire vegetarians.

There was a significant effect of gender, such that women admired vegetarians significantly more than did men, $F(1, 1687) = 44.71, p < .001, d = .31$. The effect of country was also significant, $F(3, 1687) = 124.06, p < .001$, such that admiration of vegetarians was highest in the USA and Brazil, followed by France, then finally Argentina. The interaction of gender and country was not significant, $F(3, 1687) = 1.17, p = .32$.

3.11. Being bothered by vegetarians

American (-.74) and French (-1.29) men were most bothered by vegetarians, and Argentine women (-2.08) and men (-1.98) were least bothered. Notably, no groups had a mean score above neutral, indicating that participants were not especially bothered by vegetarians.

There was a significant effect of gender, such that women were bothered by vegetarians significantly less than were men, $F(1, 1685) = 36.39, p < .001, d = .31$. The effect of country was also significant, $F(3, 1685) = 14.38, p < .001$, such that the Argentines were least bothered, followed by the Brazilians and the French, and finally the Americans. The interaction of gender and country was not significant, $F(3, 1685) = 2.08, p = .10$.

3.12. Aversion to dating vegetarians

American (.05) and French (.02) men were most averse to dating vegetarians, and Argentine women (-1.53) and men (-1.20) least averse. Notably, the most averse groups were just above the neutral point of the scale, indicating that participants were not especially averse to dating vegetarians.

There was a significant effect of gender, such that women were less averse to dating vegetarians than were men, $F(1, 1686) = 8.55, p < .01, d = .15$. The effect of country was also significant, $F(3, 1686) = 36.35, p < .001$, such that the Argentines were least averse, followed by the Brazilians, and finally the Americans and the French. The interaction of gender and country was not significant, $F(3, 1686) = 2.08, p = .10$.

3.13. Relationship between beef and vegetarian measures

All variables (beef valence, beef liking, beef consumption, admire vegetarians, bothered by vegetarians, aversion to dating vegetarians) were significantly correlated with one another at $p < .001$, with the exception of beef consumption and aversion to dating vegetarians, which was correlated at $p < .05$. Perhaps unsurprisingly, the strongest correlations were between beef liking and the other three beef measures—beef valence ($r = .56$), beef desire ($r = .43$), and beef consumption ($r = .44$). The vegetarian items were correlated less strongly with one another, with bothered by vegetarians and aversion to dating vegetarians correlated at $r = .53$, but admire vegetarians only correlating moderately with bothered ($r = -.36$) and aversion to dating ($r = -.38$). Although all measures of attitudes toward beef were significantly correlated with attitudes toward vegetarians, the strongest predictive power emerged from beef liking (admire $r = -.36$; bothered $r = .26$; aversion to dating $r = .31$). The same general pattern emerges if one conducts analyses within gender, or within country (with and without controlling for gender), although correlations are higher among women than among men, and within the USA than within the other 3 countries (see Table 4).

4. Discussion

Meat is one of the basic foods eaten by many people, and, in the Western world, beef is often the most favored member of this group. At the same time, it is one of the most difficult to produce foods, with considerable ethical and environmental ramifications, making it important to understand how people relate to it. Beef is associated with weight gain (energy density), increased incidence of some degenerative diseases, and ethical issues about the treatment and killing of animals and damage to the environment. In their spontaneous free associations, participants displayed both strong positive and negative attitudes toward beef. Although “tasty” was in the top ten for 8/8 groups, and “juicy” in the top ten for 5/8 groups, “fat/fatty” was present in 5/8, blood/bloody in 5/8, and “disgusting” in 4/8. Concern for ethical issues was far less prevalent, with “death/violence” only emerging in the two Brazilian groups. Concerns about eating beef, primarily regarding disgust and fat, appear more reliably among women (except in France), perhaps because in France, people associate food more with pleasure than with health (see Rozin et al., 1999). Negativity toward beef was relatively low, with the exception of American women (25.2%). Overall, it is only a minority (about 25%) who express

Table 4
Correlations between beef attitudes/consumption and attitudes toward vegetarians.

	1	2	3	4	5	6	7
Entire sample							
1. Beef Valence	—						
2. Beef Liking	.56***	—					
3. Beef Desire	.26***	.43***	—				
4. Beef Consumption	.25***	.44***	.22***	—			
5. Admire Vegetarians	-.28***	-.36***	-.21***	-.11***	—		
6. Bothered By Vegetarians	.16***	.26***	.21***	.12***	-.36***	—	
7. Not Date Vegetarians	.18***	.31***	.23***	.06*	-.38***	.53***	—
Argentina							
1. Beef Valence	—						
2. Beef Liking	.50***	—					
3. Beef Desire	.14*	.36***	—				
4. Beef Consumption	.23***	.42***	.12*	—			
5. Admire Vegetarians	-.09	-.22***	-.11	-.19**	—		
6. Bothered By Vegetarians	.00	.16**	.14*	.13*	-.25***	—	
7. Not Date Vegetarians	.02	.20***	.16**	.08	-.17**	.52***	—
Brazil							
1. Beef Valence	—						
2. Beef Liking	.54***	—					
3. Beef Desire	.19***	.42***	—				
4. Beef Consumption	.29***	.55***	.33***	—			
5. Admire Vegetarians	-.32***	-.39***	-.19***	-.27***	—		
6. Bothered By Vegetarians	.16***	.26***	.12**	.18***	-.50***	—	
7. Not Date Vegetarians	.21***	.34***	.20***	.20***	-.47***	.54***	—
France							
1. Beef Valence	—						
2. Beef Liking	.53***	—					
3. Beef Desire	.31***	.40***	—				
4. Beef Consumption	.17***	.29***	.26***	—			
5. Admire Vegetarians	-.13**	-.20***	-.12*	.01	—		
6. Bothered By Vegetarians	.20***	.20***	.19***	.06	-.27***	—	
7. Not Date Vegetarians	.15**	.25***	.20***	.07	-.27***	.54***	—
USA							
1. Beef Valence	—						
2. Beef Liking	.58***	—					
3. Beef Desire	.38***	.47***	—				
4. Beef Consumption	.32***	.46***	.46***	—			
5. Admire Vegetarians	-.36***	-.40***	-.26***	-.28***	—		
6. Bothered By Vegetarians	.24***	.37***	.32***	.23***	-.54***	—	
7. Not Date Vegetarians	.36***	.44***	.24***	.20***	-.52***	.50***	—

Note: * $p < .05$, ** $p < .01$, *** $p < .001$. Correlations in the entire sample are standard Pearson correlation coefficients; those given separately by country partial out the effects of gender.

ambivalence in their thoughts about beef, although this is substantially higher among Brazilian women (42%). Ambivalence may be of particular significance because changes in beef attitudes, and consumption, are probably most likely in ambivalent individuals.

The liking of beef, a central food in all of the countries studied, is very robust—among women, liking ranges from 48 to 61 (of 100), and among men, even higher (68–78). Consistent gender effects emerged across all beef-related variables—relative to men, women reported fewer positive free associations toward beef, held more ambivalent and fewer positive attitudes, and liked and desired beef less than did men. In every country but Brazil, they held more negative attitudes toward beef, and in every country but Argentina, they also ate beef less frequently than did their male peers.

Turning to attitudes toward vegetarians, overall, women were more positively inclined than were men, admiring them more in all four cultures. That said, these attitudes were predominantly neutral, with only Brazilian and American women having group means above the midpoint of the admiration scale. Furthermore, women in France and the USA were less bothered by vegetarians than were men, and there were no significant gender differences in willingness to date vegetarians.

At the country level, admiration of vegetarians was highest in Brazil and the USA. Argentine and Brazilian participants were bothered least by vegetarians, and French participants were bothered most, perhaps because, unlike the other groups, the French have a very old and well-defined national cuisine that is a large part of their identity, and vegetarians could be seen as a threat to this identity. That said, all groups were below the mean of the scale, indicating that most people did not find vegetarians particularly bothersome. Similarly, Argentine and Brazilian participants were least averse to dating vegetarians.

Our four beef variables (valence, liking, desire, and consumption) correlated positively with one another in all six cases in each of the four cultures (see Table 4). Among the highest correlations we report are between beef valence and beef liking (in the .50–.58 range). These high correlations suggest that the valence of free associations is a good measure of liking for beef. There is evidence for some coherence of our three measures of attitudes to vegetarians, although the results suggest that vegetarian admiration does not relate to any other measures in France.

The findings we report here are just a start, and have their limitations. First, although we sampled from a diverse array of cultural contexts, our sample is composed of college students, who are not representative of a country as a whole. Furthermore, our sample of Argentine men is rather small ($N = 52$), so findings regarding this particular group should be interpreted with caution. Finally, it is possible that the participants from France, who were students at a business school, may hold more conservative views toward beef, and toward vegetarians, than students of other disciplines. As such, these findings should be followed up with investigations in more representative samples, in a broader array of countries, where eating beef is more taboo (e.g., India, Nepal), and in countries where vegetarianism is relatively common (e.g., India, Germany), and where it is virtually nonexistent (e.g., Mongolia, hunter-gatherer societies).

Our results suggest that there is a significant relationship between gender and attitudes toward beef, with men being more positively inclined. Furthermore, there also appear to be country-level differences. The Argentines and French had the most positive free associations toward beef, and greatest liking for it, across genders. While the Argentines are by far the biggest beef consumers, the French have the lowest intake, while being close to Argentines in liking for beef. The high liking but relatively low intake in the French probably results from a number of factors, including a greater role for fruits, vegetables and grains (e.g., bread)

in France, and a generally lower food intake (see Rozin et al., 1999). The moderation characteristic of the French in the food domain seems to extend to beef intake. However, perhaps due to the pride of the French in their food, the French emerge as the most hostile to vegetarians. Just as the French have the least positive attitudes toward vegetarians, the American women have the most negative attitudes toward beef.

The present work adds to the small but growing body of literature on how people think about meat and vegetarians in different cultural settings (e.g., Beardsworth et al., 2002; Fessler & Navarrete, 2003; Kubberød, Ueland, et al., 2002; Lea & Worsley, 2002; Rousset et al., 2005; Ruby et al., 2013). Given the shifting popularity of meat (and beef in particular) in the developed and developing world, and growing concern about the impact of meat consumption on issues of health, food security, and environmental sustainability (e.g., Pew Commission, 2008; Steinfeld et al., 2006; Roberts, 2008), it is especially important to understand attitudes toward meat and toward vegetarians. Outside of North America and Western Europe, the field still knows little about these areas (for a review, see Ruby, 2012), and this study helps address this knowledge gap by exploring these topics in Brazil and Argentina.

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