How Much Is a Dollar Worth? The Case of Vegan Outreach

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> People do not feel in any way ashamed or guilty about spending money on new clothes or a new car instead of giving it to famine relief. (Indeed, the alternative does not occur to them.) This way of looking at the matter cannot be justified. [...W]e ought to give money away, rather than spend it on clothes which we do not need to keep us warm. To do so is not charitable, or generous. Nor is it the kind of act which philosophers and theologians have called "supererogatory"— an act which it would be good to do, but not wrong not to do. On the contrary, we ought to give the money away, and it is wrong not to do so.
>
> —Peter Singer, *Famine, Affluence, and Morality* [22]

1   Introduction

The basic premise of this essay is nothing original. Observers throughout history have noted the misallocation of society's resources, and this essay contributes little to that concept. What this piece is intended to do, however, is to pursue the question of specific numbers, at least insofar as they can be roughly approximated. For it is easy to carry a notion of the other uses to which one's money might be put as a vague abstract idea that one should heed once in a while; it is a very different decision-making dynamic when one has some tangible estimations of how much relief of suffering is forgone by a specific frivolous expenditure. That will be the focus of this piece.[1]

Expenditure	Cost ($)
average US movie ticket in 2005	6.41 [3]
a Nintendo GameCube, excluding accessories and games	99.99 [17]
tickets for a weeklong trip to Disney World by a family of four	718.06 [25]
preventing a year of suffering in a factory farm	0.02 - 3.65 (see below)

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[1]Many of the numbers used in the following estimations are very rough (sometimes made up entirely), so I did not consider it useful to make consideration for the rules of significant figures. Numbers are carried out to several digits not because they are certain to have those values but simply because including more than one digit gave them greater tangibility.

2 About Vegan Outreach

[Vegan Outreach, (www.veganoutreach.org)] is working to promote veganism through the widespread distribution of our illustrated booklets, *Why Vegan*, *Even If You Like Meat*, and *Try Vegetarian* (formerly *Vegetarian Living*). [...]

Millions of hard copies have been handed out by the local members of Vegan Outreach around the world. The rate of distribution is increasing every year, limited not by demand—there are many individuals, student groups, and organizations who would like to distribute "as many as you can send"—but by availability (*i.e.*, resources for printing and distribution). [1]

3 Cost-Effectiveness Equation

This parameter	stands for
d	expected days of life in a factory farm prevented per dollar donated.
b	the number of people who receive a brochure per dollar donated.
v	the fraction of people who become vegetarian or vegan after receiving a brochure and who wouldn't otherwise have done so.
s	fraction of those people who stay vegetarian or vegan.
t_m	average number of years for which those people would otherwise have eaten factory-farmed meat.
a_m	average number of animals those people would have eaten per year.
l_m	average lifespan (in days) of the animals they would have eaten.
f_e	fraction of those vegetarians who also stop eating eggs.
t_e	average number of years for which those people would otherwise have eaten factory-farmed eggs.
a_e	average number of eggs those people would have eaten per year.
l_e	average length of time (in days) required for a hen to produce an egg.

$$d \approx bvs(t_m a_m l_m + f_e t_e a_e l_e). \tag{1}$$

(1) is only approximate because it makes a number of simplifying assumptions—some of which I have listed below:

- It assumes that reductions in meat consumption will only result from persuading people to become permanent vegetarians or vegans. In reality, Vegan Outreach booklets probably also create many temporary vegetarians and vegans; they also encourage people who remain omnivores simply to eat less meat.

- a_m and a_e only count animals raised for meat and eggs. I have not considered the further benefits of reduced milk consumption or reduced use of animal products in areas other than food.

- (1) ignores the substantial environmental benefits that result from conversion to a vegetarian or vegan diet. (See, *e.g.*, [24].)

- (1) also fails to include broader social changes that distribution of brochures helps to effect. Even if people do not become vegetarian, they may become more conscious of animal-welfare issues, and probably they will also lobby harder for development of in vitro meat [12] (see below).

If anything, all of these factors would only increase the change in aggregated utility that results from donating money to Vegan Outreach, and ignoring them only makes the argument more conservative.

4 Estimating Parameters

In this section, I present reasonable lower and upper bounds for most of the parameters; for the rest I give single approximate values. I defend those choices in the text that follows. I use the markers "[lower bound]" and "[upper bound]" in quoted text to signal the numbers that I used.

- $4.7 \leq b \leq 8.0$.

  Until we decide to work specifically on the long-range task of bringing about animal liberation rather than "fighting brushfires," there will be an ever-increasing number of animals exploited, and never-ending deluge of suffering. We have limited resources, and we can choose to use these resources to help end the cycle of exploitation and cruelty—saving billions of individuals over time, with no more to follow. [...]

  Often, people believe that *Why Vegan* (or *Try Vegetarian*, or *Even If You Like Meat*) is an effective tool for many purposes (*e.g.*, to use at fundraisers for other groups). However, relatively few people feel that donating to print and distribute more copies is a priority.

  It is true that the work of Vegan Outreach might not seem "urgent" because we don't use pictures of individual animals saying "donate or this animal will die." But consider this:

  Right now, it is probable that 10 percent of the US population would be willing to read and consider the information in *Why Vegan*. For each one

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of these people who do not receive a copy of *Why Vegan* due to a lack of resources, numerous animals will be factory farmed and slaughtered. To reach these 26 million people, we would need to print and distribute between 30 and 50 million copies (for reference, as of January 31, 2005 we have distributed 3,879,329), at a cost of $4.5 to 5.5 million [lower bound]. While a huge number relative to Vegan Outreach's current budget, this is a small fraction of the collective funds brought in by large animal rights organizations each year. [15]

Data elsewhere on Vegan Outreach's website suggest that b may be higher than this:

Our total costs are 20 cents per *Why Vegan* distributed.

That comes out to:

– 8.7 printing for Why Vegan (new color version)

– 3.8 average shipping

– 8.6 everything else (other programs, printing of other literature, etc.) [7]

The "everything else" category most likely represents fixed costs that do not contribute to the marginal cost of printing *the next* booklet [10]. Thus, marginal cost of a booklet = $0.087 + $0.038 = $0.125 [upper bound].

- $0.0043 \leq v \leq 0.025$.

We [Vegan Outreach] estimate that out of 200 brochures given to students, at least 5 become vegetarian after reading it [upper bound]. We cannot know how accurate this is without a complicated study. We base our numbers on this:

Often while leafleting on a campus, students read the brochure and then approach us saying they are not going to eat meat any longer. Jack Norris averaged about 1 per campus when he was traveling to campuses, averaging about 235 brochures [lower bound] per campus (note: the pamphlets were less powerful and in black and white at the time he was travelling in 1996-97; we expect that they are more effective now). We also get e-mails from students saying they became veg and sometimes we run into students who told us they went vegetarian after reading the brochure from a previous time we were on campus. Assuming that there are many who never contact us after becoming veg, we conclude that 5 out of 200 is a good estimate.

We also assume that many students cut back on their animal products without fully going vegetarian. And we know that many students we reach

will influence other students to become vegetarian or vegan. We figure that these numbers can make up for any overestimate of the "5 out of 200" number. [4]

- $0.3 \leq s \leq 1$.

  This one is just a guess on my part.

- $(2021 - c) \leq t_m \leq 56$; $c :=$ current year (right now, $c = 2006$).

  The longest time for which the new vegetarians would have otherwise eaten factory-farmed meat is the duration of the rest of their lives. To approximate that, I need an estimate of the average age of those people who do become vegetarian or vegan as well as their average life expectancy.

  Vegan Outreach's Adopt a College program (http://www.veganhealth.org/colleges/) focuses on reaching out to high-school and undergraduate students, as well as to young people who attend concerts and events. Certainly some Vegan Outreach brochures reach adults as well, but those in older age groups are less likely to actually become vegetarian or vegan. A good average-age estimate might be 22 years [18]. In 2005, the average American life expectancy was 78 years [2]. Using these rough estimates, I calculate an upper bound of $78 - 22 = 56$ years.

  However, it's likely that those people *wouldn't* have otherwise eaten meat for the rest of their lives—at least not factory-farmed meat:

  "In Vitro Meat"

  By Raizel Robin

  In July, scientists at the University of Maryland announced the development of bioengineering techniques that could be used to mass-produce a new food for public consumption: meat that is grown in incubators.

  The process works by taking stem cells from a biopsy of a live animal (or a piece of flesh from a slaughtered animal) and putting them in a three-dimensional growth medium - a sort of scaffolding made of proteins. Bathed in a nutritional mix of glucose, amino acids and minerals, the stem cells multiply and differentiate into muscle cells, which eventually form muscle fibers. Those fibers are then harvested for a minced-meat product.

  Scientists at NASA and at several Dutch universities have been developing the technology since 2001, and in a few years' time there may be a lab-grown meat ready to market as sausages or patties. In 20 years, the scientists predict, they may be able to grow a whole beef or pork loin. A tissue engineer at the Medical University of South Carolina has even proposed

a countertop device similar to a bread maker that would produce meat overnight in your kitchen.

There are still several major hurdles to clear, like figuring out a way to get stem cells to proliferate cheaply enough that meat could be mass-produced. But if in vitro meat becomes viable, the environmental and ethical consequences could be profound. The thought of beef grown in the lab may turn your stomach, but in vitro meat would avoid many of the downsides of factory farming, most notably pollution: in the United States, livestock produce 1.4 billion tons of waste each year. What's more, once a meat-cell culture exists, it could function the way a yeast or yogurt culture does, so that meat growers wouldn't need to use a new animal for each set of starter cells - and the meat industry would no longer be dependent on slaughtering animals. [20]

Ground meat—the type used in hamburgers and chicken nuggets—is easier to produce in vitro and may come onto the market as early as 2016 [13]. Structured meats, on the other hand, probably won't be ready until at least 2026 [13]. Given that roughly 50 percent of global meat is ground meat [14], I calculate a "weighted-average year" that represents, for the purpose of this essay, the earliest time at which in vitro meat will begin to replace conventional meat: weighted-average year $= (0.5)(2016) + (0.5)(2026) = 2021$ [lower bound].[2]

- $21 \leq a_m \leq 32$.

  In 2005, roughly 9,415.9 million animals were raised for meat in factory farms in the US (see table below). The US population in 2005 was 296.4 million [16]. The average person in the US thus contributed to the production of 31.77 animals in that year [upper bound].

  However, the people most inclined toward vegetarianism and veganism are probably also the people who eat less meat than average to begin with. I'll suppose they eat, on average, 2/3 as much meat as the population average, although I have no basis for this specific figure [lower bound].

- $l_m \approx 49$.

  To calculate l_m from the below table, simply multiply together the entries in the third and fourth columns for each row and take the sum.[3]

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[2]In using (2021-c) as my lower bound, I am assuming that all of the people who are given a brochure would have lived until at least 2021. Some fraction of them might had died sooner, but considering that the main audience for Vegan Outreach brochures is young people, that fraction is probably close to zero.

[3]Notes on the table:

  - Cattle graze on the range for 7 months before they are sent off to feedlots, where they remain for 6 months [9]. The grazing period is not technically time spent in a factory farm, so I have limited the

Animal	Number Killed in 2005 (millions)	Fraction of the Total Killed in 2005	Average Lifespan (days)
broiler chickens	9,000.5 [19, p. 2]	0.9562	45 [9]
turkeys	248.1 [19, p. 3]	0.0264	110 [23]
hogs	103.6 [11, p. 3]	0.0110	180 [9]
cattle	32.4 [11, p. 3]	0.0034	180 [9]
ducks	27.9 [19, p. 2]	0.0030	49 [8, p. 6]
veal calves	0.7 [11, p. 3]	0.0001	120 [21]
total	9415.9	1.000	$l_m \approx 49$

- $f_e \approx 0.25$ [18].

- $(2026 - c) \le t_e \le 56$; c = 2006.

  The numbers are the same as for t_m except that the lower bound is five years higher. It will probably not be possible to produce a functional chicken uterus until at least 2026 [14].

- $202 \le a_e \le 304$.

  American hens produced 89,960 million eggs in 2005 [5, p.1]. Again using 296.4 million as the US population [16], that amounts to 303.5 eggs per person per year [upper bound]. As I did for a_m, I made the lower bound 2/3 of the upper bound.

- $l_e \approx 1.04$

  A hen needs roughly 25 hours to produce an egg [6, p.1]. (25 hours)(1 day/24 hours) = 1.04 days.

5 Results

We can now calculate lower and upper bounds for d using either all of the lower bounds or all of the upper bounds of the parameters: $100 \le d \le 18,447$. In other words, a single dollar donated to Vegan Outreach is expected to prevent between 100 days and 51 years of suffering on a factory farm.

We can also calculate D, the expected days of life on a factory farm prevented per booklet handed out:

$$D \approx vs(t_m a_m l_m + f_e t_e a_e l_e), \tag{2}$$

"lifespan" for cattle to 6 months = 180 days.

- I have neglected to include the roughly 10 billion aquatic animals killed annually for food in the US [9]. A majority of them are not intensively farmed (hence, their average lifespan in a factory farm would be 0), although a large number certainly are confined in crowded fish farms [9].

which is the same as (1) but without the b factor. Using the parameter estimates above, $21 \leq D \leq 2,306$. 2,306 days = 6.3 years.

Finally, one may be interested in the number of slaughters prevented per dollar, S. Ignoring for simplicity the contribution of eggs (despite, for instance, the significant number of male chicks ground up as part of egg production), this is

$$S \approx bvst_m a_m. \tag{3}$$

Using the above figures, $2 \leq S \leq 358$.[4]

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