

Meat Demand Monitor: Who's Buying Big in Beef?

Justin D. Bina, Glynn T. Tonsor¹

Kansas State University, Department of Agricultural Economics – July 2024

Beef and Environmental Concerns—In Brief

Amid growing media and regulatory attention to climate change, the role of food production in greenhouse gas (GHG) emissions has come under scrutiny. Specifically, the U.S. beef industry has been targeted as source of GHG emissions. Various media articles and research reports have highlighted the biological mechanisms through which cattle produce GHGs and the high emission intensity of beef production relative to other commodities (FAO, 2023; Vetter, 2020). Concerns over the environment have spurred governmental efforts to monitor and control GHG emissions (U.S. Department of Agriculture, 2023) and industry-led programs to achieve climate neutrality of U.S. cattle production (National Cattlemen's Beef Association, 2023).

Generally, research and emission reduction programs have focused on cattle and beef production. However, new research led by Tulane University and published in *Nutrients* has taken a demand-side approach to attack the growing environmental issue. To assist in the reduction of high-impact (i.e., emission intense) foods, Willits-Smith et al. (2023) identified the demographic, socioeconomic, and behavioral characteristics of U.S. residents having “disproportionate” beef consumption. Disproportionate beef consumption was defined as a beef intake exceeding four ounces per 2,200 kilocalories (Willits-Smith et al., 2023). Using the Centers for Disease Control and Prevention's National Health and Nutrition Examination Survey (NHANES), the authors found that 12 percent of respondents (the majority male) consumed disproportionate levels of beef, with these respondents accounting for half of all beef consumed (Willits-Smith et al., 2023).²

Given growing concerns over climate change—specifically, the U.S. beef industry's role—the *Nutrients* article has gained traction among researchers and popular press (Henderson, 2023; Lallanilla, 2023). Importantly, however, is that a complete and nationally representative NHANES survey has not been conducted since 2018. Thus, the authors' analysis does not capture the most current demand-side market trends. With increasing environmental concerns, policy/industry efforts to curtail livestock GHG emissions, and the economic importance of the U.S. beef industry, a parallel assessment using updated data is necessary. Using publicly available Meat Demand Monitor (MDM) data, this report assesses differences in beef consumption and package sizes purchased across consumers varying in age, gender, income, and financial sentiment. While MDM and NHANES data cannot be directly compared due to differences in each survey's design, this assessment provides an important update to prior research findings.

¹ Bina is a research assistant and Tonsor is a professor in the Department of Agricultural Economics at Kansas State University. Contact the authors at jbina97@ksu.edu or gtonsor@ksu.edu.

² The full article can be found at <https://doi.org/10.3390/nu15173795>.

Data

This report utilizes MDM responses from the second quarter of 2024. Survey responses are weighted to be representative of the U.S. population in terms of age, gender, race, education, income, and region of residence. To ensure the quality of MDM data, responses are filtered according to procedures outlined in the MDM project methodology statement (<https://agmanager.info/livestock-meat/meat-demand/monthly-meat-demand-monitor-survey-data/meat-demand-monitor-project>). Specific to this report, responses are additionally filtered if 1) respondents do not provide a complete prior day recall of their beef consumption or 2) they do not provide the package size of their most recent beef purchases. In all, this report reflects 8,216 MDM respondents for Quarter 2 2024.

Prior Day Beef Consumption

In the MDM, respondents are asked to provide the number of yesterday's meals (from one to three) that contained beef, pork, chicken, seafood, and alternative proteins.^{3,4} Nationally, and during Quarter 2 2024, respondents indicated consuming beef in 0.70 of their prior day meals, on average. Sizable disparities are present between genders as males consume beef in roughly 0.82 meals per day while females consume at a relatively lower rate of 0.58 meals per day. Beef consumption is also skewed younger, with respondents aged 18 to 24 consuming beef in 0.92 of their prior day meals and respondents aged 65 and older consuming at a rate of 0.49 meals per day, on average.

Table 1. Prior Day Beef Consumption by Age

Age Cohort (years)	Number of Respondents	Number of Prior Day Meals
18-24	296	0.92
25-34	891	0.82
35-44	1,387	0.83
45-54	1,498	0.69
55-64	2,170	0.56
65 and older	1,974	0.49

Interestingly, beef consumption frequency—as measured by the MDM's prior day recall—does not increase with household income. Beef is included in 0.73 meals per day for those with annual household incomes under \$60,000. Conversely, the lowest frequency of beef consumption occurs among individuals with annual household incomes above \$60,000, with these earners consuming beef in between 0.65 and 0.67 meals per day, on average.

Table 2. Prior Day Beef Consumption by Income

Annual Household Income	Number of Respondents	Number of Prior Day Meals
Under \$20,000	1,087	0.73

³ The prior day recall is a measure of consumption that accounts for frequency, but not for volume.

⁴ The most commonly consumed food item within the "alternative proteins" category is eggs.

\$20,000-\$59,999	3,479	0.73
\$60,000-\$99,999	2,086	0.65
\$100,000 or greater	1,564	0.67

Rather than transition away from beef and into relatively cheaper protein sources (i.e., pork and chicken), those with lower incomes may transition to less costly alternatives within the beef carcass itself. To evaluate this, we further evaluated consumption of beef products that differ in their relative prices—ribeye steak, ground beef, and beef roast—and again by annual household income. Individuals in each income bracket consume ribeye steak and beef roast at roughly the same frequency; in around 0.01 to 0.03 meals per day, on average. However, discrepancies exist in prior day consumption of ground beef. MDM respondents earning less than \$100,000 annually reported consuming ground beef in between 0.25 to 0.28 meals per day, on average. Conversely, the highest earners—those making over \$100,000 annually—reported consuming ground beef in only 0.14 meals per day, on average. These results suggest that individuals with lower incomes, rather than transition out of beef consumption entirely, are willing to purchase and consume a relatively lower-priced beef product such as ground beef. It should be further noted that, while higher earners do not appear to consume higher-priced ribeye steak more frequently than lower earners, these individuals may more frequently consume beef products that are labeled or have other added value—resulting in higher relative expenditures on beef.

Table 3. Prior Day Ground Beef, Ribeye Steak, and Beef Roast Consumption by Income

Annual Household Income	Number of Respondents	Product	Number of Prior Day Meals
Under \$20,000	1,087	Ground Beef	0.25
		Ribeye Steak	0.02
		Beef Roast	0.01
\$20,000-\$59,999	3,479	Ground Beef	0.28
		Ribeye Steak	0.02
		Beef Roast	0.02
\$60,000-\$99,999	2,086	Ground Beef	0.25
		Ribeye Steak	0.03
		Beef Roast	0.02
\$100,000 or greater	1,564	Ground Beef	0.14
		Ribeye Steak	0.03
		Beef Roast	0.02

Conclusions regarding ground beef, as seen in Table 3, are further supported when assessing prior day ground beef consumption by MDM respondents' financial sentiment. Those with negative perceptions of their current financial situation (36 percent of the sample) reported consuming ground beef in around 0.30 meals per day, on average, while those with positive perceptions of their financial situation (17 percent of the sample) reported lower frequency of ground beef consumption at around

0.14 meals per day. This again suggests willingness to maintain beef consumption as incomes or financial sentiment decline, albeit with a transition to cheaper beef products.

Finally, to assess which disaggregated demographic group consumes beef most frequently, we calculate average prior day meals including beef across gender/age/income cohorts. Important to consider is that, at that level of disaggregation, some cohorts have a small number of respondents and results should be interpreted with care.

Table 4. Prior Day Beef Consumption by Gender, Age, and Income Cohort

Gender	Age Cohort (years)	Annual Household Income	Number of Respondents	Number of Prior Day Meals
Female	18-24	Under \$20,000	28	0.70
		\$20,000-\$59,999	77	0.90
		\$60,000-\$99,999	11	0.67
		\$100,000 or greater	6	0.64
	25-34	Under \$20,000	73	0.56
		\$20,000-\$59,999	175	0.62
		\$60,000-\$99,999	95	0.60
		\$100,000 or greater	46	0.70
	35-44	Under \$20,000	127	0.63
		\$20,000-\$59,999	291	0.71
		\$60,000-\$99,999	129	0.68
		\$100,000 or greater	92	0.71
	45-54	Under \$20,000	127	0.65
		\$20,000-\$59,999	357	0.67
		\$60,000-\$99,999	201	0.61
		\$100,000 or greater	114	0.52
	55-64	Under \$20,000	200	0.53
		\$20,000-\$59,999	558	0.51
		\$60,000-\$99,999	268	0.42
		\$100,000 or greater	173	0.42
65+	Under \$20,000	85	0.47	
	\$20,000-\$59,999	438	0.48	
	\$60,000-\$99,999	281	0.36	
	\$100,000 or greater	176	0.42	
Male	18-24	Under \$20,000	37	0.96
		\$20,000-\$59,999	77	1.00
		\$60,000-\$99,999	39	1.02
		\$100,000 or greater	21	1.02
	25-34	Under \$20,000	71	1.15
		\$20,000-\$59,999	189	0.94
		\$60,000-\$99,999	131	0.89

		\$100,000 or greater	111	1.03
35-44		Under \$20,000	80	1.04
		\$20,000-\$59,999	303	0.93
		\$60,000-\$99,999	175	0.93
		\$100,000 or greater	190	1.00
45-54		Under \$20,000	91	0.78
		\$20,000-\$59,999	291	0.87
		\$60,000-\$99,999	155	0.74
		\$100,000 or greater	162	0.73
55-64		Under \$20,000	120	0.70
		\$20,000-\$59,999	383	0.75
		\$60,000-\$99,999	253	0.76
		\$100,000 or greater	215	0.54
65+		Under \$20,000	48	0.61
		\$20,000-\$59,999	340	0.61
		\$60,000-\$99,999	348	0.59
		\$100,000 or greater	258	0.48

Of note is that females aged 55 years and older generally consume beef less frequently, on average. Conversely, males aged 18 to 54 across any income bracket consume beef relatively more frequently. Of the MDM-derived top 20 beef consuming cohorts, 16 were males aged 18 to 54 years. These cohorts account for 33 percent of the 48 total cohorts but 80 percent of the top 20 beef consuming cohorts. In comparison, Willits-Smith et al. (2023) found that disproportionate beef consumption was more likely to occur among males and that the frequency of disproportionate consumption peaked at ages around 50 to 65 years. While we track a different measure of consumption—that is, frequency rather than volume—and do not implement regression analysis techniques, our simple summary statistics provide an update, and generally lend credence, to their results.

Beef Purchases by Package Size

An alternative comparison to the work of Willits-Smith et al. (2023) is an assessment of purchases; specifically, the package sizes bought of various beef products. This, in addition to the prior day consumption frequencies discussed above, provides a measure of product volume and moves our MDM-based consumption assessments closer to those of Willits-Smith et al. (2023) NHANES-based efforts.

Respondents are asked in the MDM to provide the package size of their last purchase of steak, ground beef, and roast. Options range from “Under 5 oz.” to “Over 2 lb.” Considering that consumers may purchase package sizes based on the number of people in their household—convoluting any demographic impacts on individual-level purchases—we limit our analysis in this section to only the 2,138 MDM respondents who indicate that they live by themselves.

In aggregate, individuals purchase steaks in packages of 9 to 16 ounces, ground beef in packages of 13 to 16 ounces, and roasts in packages of 13 to 16 ounces relatively more frequently than other

package sizes. Additionally, 24 percent, 11 percent, and 34 percent of individuals do not know the package size of their last steak, ground beef, and roast purchase, respectively, or do not purchase those products.

Table 5. Share of Respondents Purchasing a Specific Package Size

Number of Respondents	Product	Package Size							
		Under 5 oz.	5-8 oz.	9-12 oz.	13-16 oz.	17-20 oz.	21-24 oz.	Over 2 lb.	I do not know/purchase
2,138	Steak	0.04	0.15	0.17	0.21	0.09	0.06	0.03	0.24
	Ground Beef	0.05	0.11	0.11	0.37	0.08	0.07	0.10	0.11
	Roast	0.04	0.07	0.08	0.18	0.07	0.11	0.10	0.34

Note: The row for “Steak” is interpreted as 4 percent of respondents purchase steak in package sizes under 5 ounces, 15 percent of respondents purchase steak in package sizes between 5 and 8 ounces, and so on. Each row sums to 1, with some rounding errors.

Breaking down package size purchases by MDM respondents’ demographic characteristics provides additional insight. For each of steak, ground beef, and roast, males purchase larger package sizes than females by 0.4 (ground beef) to 1.1 (roast) ounces. Individuals aged 65 years and older purchase larger packages of ground beef; around 0.5 ounces larger than other age groups. There was no relationship between annual household income (or financial sentiment) and package size.⁵ These findings mirror comments made by Willits-Smith et al. (2023) that disproportionate beef consumption was most strongly associated with being male and was not associated with family income.

Conclusions

Current societal concerns over the U.S. beef industry’s role in GHG emissions warrant further assessments of not only beef production practices, but also beef consumption. Prior work has assessed the demographic drivers of U.S. beef consumption using outdated data that may not be reflective of current consumption decisions. We provide an update to that research, using the MDM to assess differences in prior day beef consumption and beef package sizes between consumers who vary in demographic characteristics and financial sentiment. Frequency of beef consumption is higher among males and younger individuals. Differences in beef consumption frequency by annual household income are small and suggest that lower earners shift to less costly beef products (i.e., ground beef) rather than shift consumption to other animal proteins. Regarding beef package sizes, males purchase larger packages of steak, ground beef, and roast than females. This finding, paired with males’ higher frequency of beef consumption, is consistent with prior research.

⁵ Interval regression was used to estimate the associations of gender, age, annual household income, and financial sentiment with package size. The estimates discussed were statistically significant at the five percent level.

References

- FAO. (2023). Key Facts and Findings. Food and Agriculture Organization of the United Nations. <https://www.fao.org/news/story/en/item/197623/icode/>
- Henderson, G. (2023, September 1). 12 Percent Eat Half of America's Beef, Study Says. Drovers. <https://www.drovers.com/news/industry/12-percent-eat-half-americas-beef-study-says>
- Lallanilla, M. (2023, August 31). Just 12% of Americans—Mostly Men—Are Eating Half of Our Beef Supply: New Research. New York Post. <https://nypost.com/2023/08/31/50-of-us-beef-is-eaten-by-just-12-of-americans-mostly-men-study/>
- National Cattlemen's Beef Association. (2023). Sustainability. NCBA. <https://www.ncba.org/producers/sustainability>
- U.S. Department of Agriculture. (2023). Greenhouse Gas Inventory and Assessment Program. USDA. <https://www.usda.gov/oce/energy-and-environment/climate/mitigation>
- Vetter, D. (2020, October 5). Got Beef? Here's What Your Hamburger Is Doing To The Climate. Forbes. <https://www.forbes.com/sites/davidrvetter/2020/10/05/got-beef-heres-what-your-hamburger-is-doing-to-the-climate/>
- Willits-Smith, A., Odinga, H., O'Malley, K., & Rose, D. (2023). Demographic and Socioeconomic Correlates of Disproportionate Beef Consumption Among US Adults in an Age of Global Warming. *Nutrients*, 15(17), 3795. <https://doi.org/10.3390/nu15173795>

[View more information about the authors of this publication and other K-State agricultural economics faculty.](#)

For more information about this publication and others, visit [AgManager.info](https://www.agmanager.info).

K-State Agricultural Economics | 342 Waters Hall, Manhattan, KS 66506-4011 | (785) 532-1504 | Fax: (785) 532-6925

[Copyright 2024 AgManager.info, K-State Department of Agricultural Economics.](#)