

FY25 Nitrogen Footprint Report for Colorado State University

With specific considerations for CSU Residential Dining Services

Introduction

Purpose and Scope

This report quantifies the nitrogen emissions of Colorado State University (CSU) operations for FY25. The report also includes a detailed analysis of the nitrogen footprint from food procurement by CSU Residential Dining Services and highlights key areas for reductions.

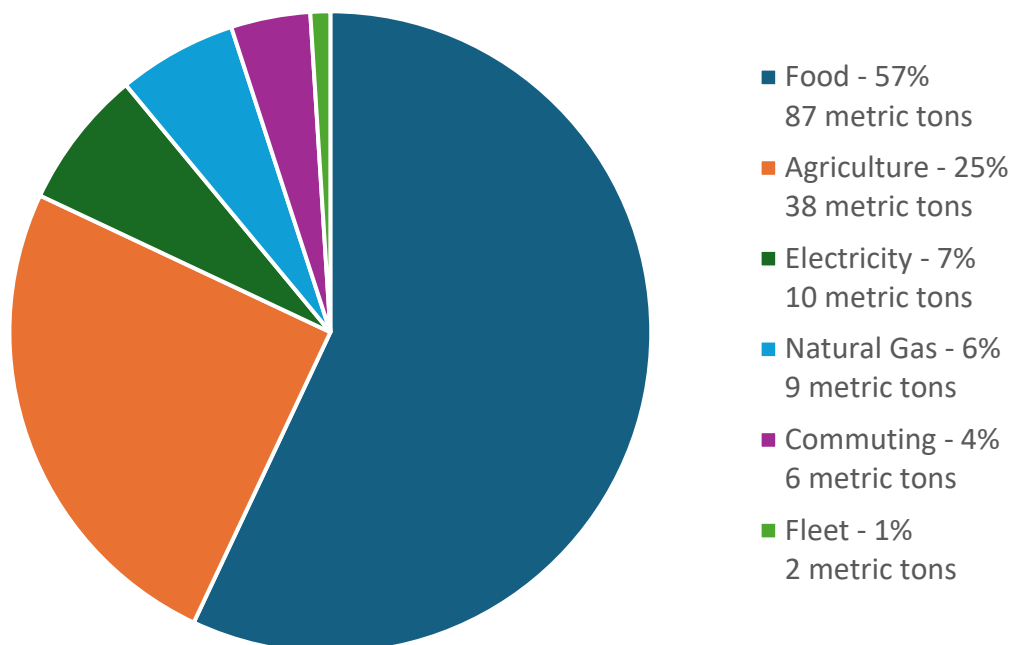
Importance of a Nitrogen Footprint

Nitrogen is essential in agricultural production but can contribute to environmental issues like air and water pollution, climate change, and biodiversity loss when overused. Calculating the nitrogen footprint and focusing on food procurement allows CSU to optimize sustainability efforts, improve resource efficiency, reduce operational costs, and helps cultivate a culture of sustainability across the campus community.

Key Findings and Results

For FY25, the gross nitrogen footprint from university operations, including food purchases made by CSU Residential Dining Services (RDS), was 152 metric tons (MT). Food purchases make up the single largest category, which accounted for 87 MT or 57%.

FY25 Nitrogen Footprint for Colorado State University



Since purchased foods represent 57% of the total nitrogen emissions, a closer look each food category for FY25, ranked high-to-low by nitrogen impact (not by dollars spent or total weight of purchased product) is summarized in this table with further analysis to follow.

Food Category	Food Weight kg	Pounds	Total N (kg N)	N by %
Beef	117,470	258,977	39,226	45%
Chicken	150,106	330,927	18,176	21%
Pork	52,999	116,843	7,266	8%
Cheese	53,756	118,512	5,259	6%
Grains	206,263	454,732	3,724	4%
Milk	160,633	354,135	3,307	4%
Coffee & Tea	45,646	100,632	2,825	3%
Liquids	267,476	589,684	1,471	2%
Vegetables	160,284	353,366	1,463	2%
Eggs	20,878	46,028	1,337	2%
Fish	14,007	30,880	1,163	1%
Potatoes	113,734	250,741	730	<1%
Fruits	105,189	231,902	325	<1%
Sugars	96,378	212,477	193	<1%
Beans	25,949	57,208	176	<1%
Nuts	4,242	9,352	58	<1%
Spices	1,160	2,557	32	<1%
Oils	70,025	154,379	24	<1%
Totals:	1,666,195	3,673,331	86,755	100%

Methodology of the Nitrogen Footprint

Data Collection and Conversion

The annual CSU Greenhouse Gas (GHG) Inventory, also known as the Carbon Footprint, serves as the foundation for calculating the nitrogen footprint. Every category accounted for in the GHG inventory also has a corresponding nitrogen impact. What distinguishes the nitrogen footprint is the inclusion of food procurement data. This specific food data was obtained from CSU Residential Dining Services and included detailed records of all food purchases made during FY25. The data was organized by total spend, weight, and food category. To standardize the analysis, all weights and volumes were converted into kilograms.

The analysis covers 18 food categories, detailing their contributions to the total nitrogen footprint. By analyzing the results of these categories, RDS can identify key areas where nitrogen emissions have the greatest impact and could be reduced.

Data Entry into SIMAP

The standardized data was entered into the Sustainability Indicator Management and Analysis Platform (SIMAP) food template. SIMAP calculates the nitrogen footprint by applying specific emission factors to each food category, taking into account production and procurement. SIMAP then generates a comprehensive report that provides detailed insights into the nitrogen impacts.

Institutional Context

CSU is a leading public research university in Fort Collins, Colorado. With a commitment to sustainability, CSU aims to reduce its environmental impact through initiatives such as energy efficiency projects, waste reduction programs, and sustainable food procurement practices. During FY25, CSU served a community of more than 28,700 students, and 8,600 employees. Residential Dining Services spent over \$9 million on food procurement and served over 2.8 million meals.

Housing & Dining Services and RDS play a pivotal role in CSU's sustainability efforts by providing nutritious and sustainable food options, managing dining facilities, and implementing initiatives to reduce the environmental impact of dining services.

Comparative Analysis and Considerations for RDS

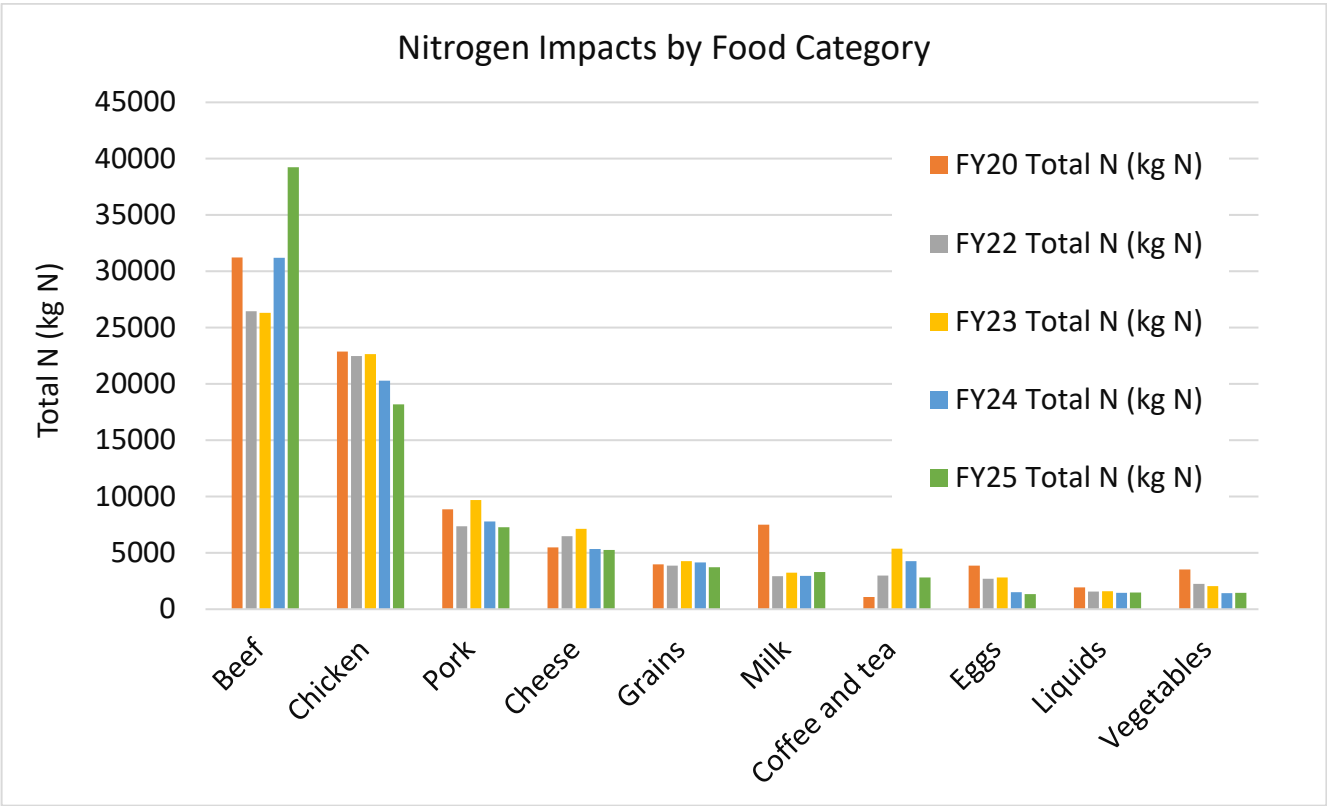
FY25 food related nitrogen impact increased by about 4% compared with FY24, from 83 metric tons N to 87 metric tons N. During the same period, meals served increased by about 6%. Because meals increased faster than total nitrogen, nitrogen impact per meal decreased slightly from 0.0312 kg N per meal in FY24 to 0.0307 kg N per meal in FY25. Compared with FY20, total food-related nitrogen is about 9% lower, meals served are about 34% higher, and nitrogen impact per meal is about 32% lower.

Nitrogen Impacts	FY20 Totals	FY22 Totals	FY23 Totals	FY24 Totals	FY25 Totals
Total N (metric tons N):	95	82	88	83	87
Total meals served:	2,105,245	2,177,094	2,485,826	2,664,077	2,825,118
N impact per meal (kg):	0.0451	0.0378	0.0356	0.0312	0.0307

Note: The data from FY21 has been removed from the table due to the significant impact of COVID-19 on RDS operations and procurement activities.

Overall, the FY20 through FY25 data shows that food-related nitrogen impact is trending downward. The nitrogen impact per meal shows a stronger decrease over time. However, changes in individual food categories still appear to vary from year to year, so continued tracking is needed to better understand procurement patterns and food related nitrogen reduction opportunities.

The following table summarizes the trend in nitrogen emissions for each of the ten largest food categories.



Note: The data from FY21 has been removed from the table due to the significant impact of COVID-19 on RDS operations and procurement activities.

Interpretation of Results

In FY25, RDS’s food purchases generated a total of 87 MT of nitrogen emissions, accounting for 57% of CSU’s gross nitrogen footprint of 152.32 MT. Food remained the largest contributor to CSU’s nitrogen footprint. Meat products, especially beef, chicken, and pork, were the main food-related contributors, together accounting for 74% of the total food-related nitrogen impact. This shows that high-impact meat categories continue to be the most important area for RDS to monitor when identifying nitrogen reduction opportunities.

RDS can continue making progress by promoting plant forward menu options, reducing food waste, and working with suppliers to explore lower-impact sourcing practices where possible. These efforts support CSU’s broader sustainability goals while helping Dining Services better understand how food purchasing decisions affect the university’s nitrogen footprint.

Considerations for RDS to Reduce Nitrogen Impacts

- **Focus on High-Impact Categories / Reduce Meat Purchases:** Beef, chicken, and pork remained the largest food-related contributors in FY25, together accounting for 74% of RDS's food-related nitrogen impact. Reducing purchases in these categories, especially beef, would have the greatest potential to lower the footprint.
 - For example, chicken purchases decreased by about 10% from FY24 to FY25, and the nitrogen impact decreased similarly, from 20,283 kg N to 18,176 kg N. This suggests that targeted reductions in high-impact meat purchases can produce clear nitrogen savings.
- **Increase / Promote Plant Based Options:** Continue increasing and encouraging plant-based and lower-impact menu options where feasible. Shifting some demand away from high-impact meat products can help reduce the overall food-related nitrogen footprint.
- **Sustainable Procurement / Engage Suppliers:** Work with suppliers to explore sustainable farming and lower-impact sourcing practices. Organic and/or locally sourced products can also be considered where they are practical and supported by procurement data.
- **Educational Campaigns:** Raise awareness about the environmental impact of food choices. Clear communication can help students understand how dining choices connect to CSU's broader sustainability goals.
- **Monitor and Report:** Continue tracking and reporting the nitrogen footprint by food category. This will help RDS understand how changes in purchasing patterns affect nitrogen impacts over time.
- **Continue and Enhance Food Waste Reduction Programs:** Continue existing food waste reduction efforts and look for additional opportunities to minimize food waste.

Acknowledgments

This Report was prepared by Ehshan Moon, Impact MBA Corporate Sustainability Fellow to CSU Facilities Management and Stacey Baumgarn, CSU Sustainability and Energy Management Program Manager. We would like to extend our gratitude to Mary Liang, Associate Director of Sustainability for Housing & Dining Services and Lucas Miller, Director Residential Dining Services at Colorado State University, for their cooperation and for providing the necessary data. This report reflects a collective effort to enhance CSU's sustainability initiatives and reduce its environmental impact. Thank you to all contributors for their dedication and commitment to sustainability at CSU.

