Menus of Change Principles impact on the Carbon Footprint of Top Dining Meals  
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**Introduction**

Research has shown that our everyday choices, including our diets, are imposing environmental consequences. Farm to gate impacts of beef consumption regularly have the highest emissions equivalent\[^1,2,3\]. Our project attempts to quantify the impact of top dining meals in Lower Dining Hall at Boston College (BC); Screaming Eagle (Steak and Cheese & Chicken and Cheese subs), The Grateful Burger, and the Salad bar. We also aim to identify which Menus of Change principles and guidelines will reduce BC’s impact the most\[^4\].

Diet is a conscious choice we make often and it is crucial to understand the impact our everyday meals have on the environment including the stages from farm to gate, meaning the impacts of production through when Boston College purchases. We expect that a substantial decrease on the environment including the stages from farm to gate, crucial to understand the impact our everyday meals have including our diets, are imposing environmental consequences. Farm to gate impacts of beef consumption including our diets, are imposing environmental influences on an individual and semester impact basis\[^4\]. Our diet is a conscious choice we make often and it is crucial to understand the impact our everyday meals have on the environment including the stages from farm to gate, meaning the impacts of production through when Boston College purchases. We expect that a substantial decrease on the environment including the stages from farm to gate, crucial to understand the impact our everyday meals have including our diets, are imposing environmental consequences. Farm to gate impacts of beef consumption including our diets, are imposing environmental influences on an individual and semester impact basis\[^4\].

**Objectives**

- Identify individual impacts of top dining meals at Lower on an individual and semester impact basis\[^1,2,3\].
- Leverage Menus of Change principles potential to lower impact through recommended substitutions\[^4\].
- Compare impacts of each meal against each other and calculate equivalence to GHG emissions\[^1,2,3\].

**Methods**

- Using the top ingredients in each recipe, we determined the Global Warming Potential (kg CO\(_2\) eq) of each food product through Life Cycle Assessment (LCA) literature. Beef and cheese calculations were made from LCA’s in the US\[^1,2\]. Fresh produce values were taken from median global warming values from 369 studies of 168 fresh produce categories\[^3\].
- Multiplied the amount (kg) of ingredient in recipe with the CO\(_2\) emission found from the LCA, and sum total impact of each meal, reporting values for individual meal impacts (Fig 1) and 2018 Semester impact (Fig 2).
- Quantify and determine alternatives to lower impacts through Menu of Change principles, and calculated the potential impact of “Serve less red meat less often”\[^4\] compared to current semester serving regimens (Fig 3).

**Results**

<table>
<thead>
<tr>
<th>Meal</th>
<th>CO(_2) eq, kg</th>
<th>Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beef and cheese</td>
<td>8.13</td>
<td>2 times more than chicken and cheese.</td>
</tr>
<tr>
<td>Chicken and cheese</td>
<td>3.6</td>
<td>4 times greater than the grateful burger and the salad bar at 2.4 kg CO(_2)</td>
</tr>
<tr>
<td>Grateful burger</td>
<td>7.4</td>
<td>7.4 times less than steak and cheese</td>
</tr>
<tr>
<td>Salad</td>
<td>13.7</td>
<td>13.7 gallons of gas consumed.</td>
</tr>
</tbody>
</table>

![Greenhouse Gas Impact of Individual Top Dining Meals](image1)

**Discussion/Conclusions**

- Steak and cheese has the highest contribution to GHGE emissions, with two times more than any of the other top meal options at Lower Dining Hall.
- Individual steak and cheese emissions amount to 8.13 kg CO\(_2\) per serving; two times greater than chicken and cheese, 3.6 kg CO\(_2\) and 4 times greater than the grateful burger and the salad bar at 2.4 kg CO\(_2\) and 2.17 kg CO\(_2\) respectively (Figure 1).
- With Boston College’s current menu schedule and student demand, the impact of steak and cheese sums to 900,000 kg CO\(_2\) per semester, over five times of the grateful burger and chicken & cheese, and 870 times the salad bar (Figure 2).
- Switching the menu scheduling of steak and cheese to four times a week, 2 lunches and 2 dinners, per the Menus of Change Principle 10., instead of the current offering at nine times a week would decrease semester emissions by 480,000 kg CO\(_2\) (Figure 3).
- For the purposes of making these GHGE equivalents accessible we used the EPA GHG emission calculator to portray these impacts as gallons of gas consumed. The Menus of change substitution in Fig. 3, would save the equivalent of 53,915 gallons of gas per semester\[^1,2,3\].

**Recommendations**

1. Students should consider decreasing the total consumption of high GHGE meals such as the steak and cheese, and choosing to enjoy the grateful burger or Salad bar more often.
2. Boston College should implement Menus of Change Principles, including eat less red meat, less often to directly reduce the emission impact of meals such as the Steak and Cheese.
3. Additionally further research into recipes and their respective individual ingredient footprints should be analyzed for alternatives and strategies that have lower GHGE emissions, totalling to lower total meal impacts.

**References & Acknowledgments**

Thank you to Boston College Sustainability Director for Dining, Juli Stelmaszyk, for providing us with the data on top dining meals, recipes, and sales reports needed to assess impacts of meals on campus. Thank you to Tara Pisani-Girard for guidance and instruction throughout the semester in Environmental Studies Seminar.

**In order of citation:**


A semester’s worth of top meals calculated to reflect equivalent CO\(_2\) emissions from gallons of gas consumed using the GHG Equivalency calculator from the EPA\[^4\].

![Greenhouse Gas Impacts of 2018 Semester Top Dining Meals](image2)