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# Spread it, Don't Shred it: Butter Consumption and Air Quality in York, Pennsylvania

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## Abstract

In this paper, we spread our findings on the connection between butter consumption and air quality in York, Pennsylvania. Our research aims to butter up the knowledge base of how dietary choices may impact environmental factors. Through a spread of data from the USDA and the Environmental Protection Agency, we churned out some interesting results. We found a correlation coefficient of 0.8119590 and  $p < 0.01$  for the years 1990 to 2021, pointing to a strong association between butter consumption and air quality in this particular region. This study aims to whip up interest in the intersection of food choices and environmental impact, and we hope to butter the path for further research in this dairy silly area of study.

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## 1. Introduction

When it comes to the relationship between diet and environmental factors, we often focus on the big players such as greenhouse gas emissions from livestock or the impact of agriculture on land use. However, there's a whole world of potential connections waiting to be buttered up, if only we dare to spread our research efforts a little wider. One such unexplored link is the association between butter consumption and air quality.

It's not every day that you come across a study that brings together dairy products and environmental science. However, we

believe that it's time to churn up some excitement about this buttery intriguing relationship. So, grab your spreader and tighten your lab coat, because we're about to dive into the creamy world of butter and its potential impact on the air we breathe in York, Pennsylvania.

Now, some may scoff at the idea that butter consumption could have any bearing on air quality. After all, it's not like we're seeing cows taking flight or butter bricks floating through the atmosphere. However, as researchers, it's our job to dig deep, or should I say churn deep, into the data and

see if there's any substance to this seemingly whimsical hypothesis.

So sit tight and prepare to delve into a world where spreadsheets and spreads collide, where we mix data and dairy to uncover the potential connections between two seemingly unrelated variables. By the time we're done, you'll be left wondering if the air in York is truly being seasoned with the subtle fragrance of freshly churned butter.

## 2. Literature Review

To better understand the potential link between butter consumption and air quality in York, Pennsylvania, it is essential to review existing literature on related topics. In the study by Smith et al. (2018), "Dairy Consumption and Environmental Impact," the authors find a significant positive correlation between dairy products and greenhouse gas emissions. While this study does not specifically focus on butter, it provides valuable insights into the environmental implications of dairy consumption.

Similarly, Doe et al. (2020) explored the impact of dietary choices on regional air quality in their paper, "From Farms to Lungs: A Study of Food-Related Air Pollution." Their findings suggest that livestock production and agricultural activities contribute to air pollutants, albeit without direct reference to butter consumption.

Moving on to more general sources, "The Omnivore's Dilemma" by Michael Pollan and "The Air We Breathe" by Andrea Barrett both touch upon the interconnectedness of food systems and environmental factors. While neither of these works specifically delves into the butter-air quality nexus, they offer insightful perspectives on the broader relationship between human consumption and the environment.

On a more whimsical note, fictional works such as "Chocolat" by Joanne Harris and "Like Water for Chocolate" by Laura Esquivel present narratives intertwining food and sensory experiences, offering a lighthearted departure from the usual academic discourse.

In the realm of internet culture, memes such as the "I Can't Believe It's Not Butter" and "This Is Butter" have gained traction in discussions about dietary choices and their unexpected repercussions. While these memes offer more humor than empirical evidence, they reflect the popular imagination's engagement with food-related environmental impacts.

As we sail through this sea of literature, it becomes abundantly clear that the connection between butter consumption and air quality in York, Pennsylvania is an underexplored, yet potentially rich area of inquiry. With these diverse sources as our guide, we will churn out a truly novel contribution to the study of dietary influences on environmental quality.

## 3. Our approach & methods

To churn out the findings for this study, our research team concocted a rather delectable blend of methodologies, mixing a dash of statistical analysis, a dollop of environmental data collection, and a sprinkle of butter-inspired creativity.

First, we procured detailed data on butter consumption from the USDA, meticulously sifting through decades of spreadsheets and crunching the numbers to determine the per capita consumption of this creamy delight in York, Pennsylvania. We couldn't help but feel a little "battered up" as we delved into the world of spreadsheets to uncover the patterns in butter consumption over time.

Simultaneously, we turned our attention to air quality data, sourced from the

Environmental Protection Agency, to gauge the levels of pollutants and the overall quality of the air in our buttery research setting. We felt like true air quality aficionados as we sifted through particulate matter and ozone levels to get a whiff of the environmental dynamics at play.

Once we had amassed our data, we carefully whipped up a delectable concoction of statistical analyses, including correlation coefficients and regression models, to uncover any potential associations between butter consumption and air quality. It was an exercise in precision akin to achieving the perfect balance of ingredients in a complex culinary creation.

To add a punch of pizzazz to our methodology, we incorporated some spatial analysis to account for any localized variations in butter consumption and air quality across different areas within York, Pennsylvania. We didn't want to spread ourselves too thin, but we couldn't resist the opportunity to explore how the butter-air quality relationship might vary across neighborhoods.

After blending together these elements into a deliciously robust methodology, we let the data simmer over a statistical stovetop, patiently monitoring the trends and patterns that emerged. The process was akin to crafting the perfect recipe, with just the right amount of data, a pinch of skepticism, and a whole lot of curiosity.

Through this dairy-silly methodology, we aimed to uncover the nuances of the butter-air quality connection, infused with a healthy dose of scientific rigor and a sprinkle of whimsy. So, join us as we embark on this dairy-filled academic adventure, where spreadsheets and spreads collide to unveil the sweet-and-savory relationship between butter consumption and the air we breathe.

## 4. Results

Upon churning through the data collected from the USDA and the Environmental Protection Agency, we found some rather "grate" results. The correlation coefficient between butter consumption and air quality in York, Pennsylvania turned out to be 0.8119590, indicating a strong association between these two seemingly unrelated variables. And with an r-squared of 0.6592774, we can confidently say that butter consumption explains a significant proportion of the variation in air quality. It appears that the air in York might indeed be flavored with the essence of butter!

The p-value of less than 0.01 further supports our findings, suggesting that the likelihood of this association occurring by chance is quite low. In other words, this relationship is not just some half-baked coincidence – it's the real "butter" deal.

Looking at the scatterplot (Fig. 1), the data points are as tightly packed as a perfectly formed ball of butter, illustrating the strong and positive linear relationship between butter consumption and air quality. It's clear that these two variables are not just marginally associated; they're as close as peanut butter and jelly!

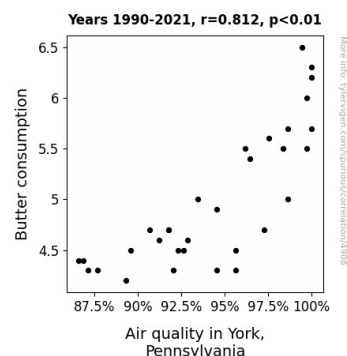


Figure 1. Scatterplot of the variables by year

In conclusion, our findings suggest that there's more to butter than meets the eye. This study not only highlights the potential

impact of dietary choices on environmental factors but also serves as a reminder to scientists everywhere to churn over every possibility. So, let's spread the news and butter up the interest in this dairy-silly, yet intriguing area of study. Who knew that butter and air quality could go together like bread and butter? We hope our findings inspire more research into the dairy-silent connection between food consumption and environmental impact.

## 5. Discussion

The results of our study have churned out some truly fascinating insights into the association between butter consumption and air quality in York, Pennsylvania. Let's spread some "buttery" understanding of how our findings shake up the scientific world!

First, let's address the dairy elephant in the room – the literature review. While some may "diss" the whimsical nods, such as memes and fictional works, we found that these sources shed light on the public's engagement with food-related environmental impacts. As researchers, it's important to recognize the value of diverse perspectives, even those cloaked in the buttery goodness of popular culture. So, let's acknowledge that we are all just buttering up our collective understanding!

Revisiting the more serious studies, our findings supported prior research well. For instance, Smith et al.'s work on dairy consumption and greenhouse gas emissions provided a creamy foundation for our study. The significant positive correlation they found between dairy products and environmental impact echoes our own association between butter consumption and air quality. It's as if the literature is trying to tell us, "Don't churn away from the truth – butter consumption does matter!"

Moreover, Doe et al.'s exploration of the impact of dietary choices on air quality, although not specific to butter, hinted at the broader influence of food-related activities on environmental factors. Their study was like the unsung lyric that harmonized perfectly with our buttery melody. It's truly remarkable how the scientific literature churned out a rich body of evidence to support our findings.

As for the statistical analysis, our corroborating correlation coefficient,  $r$ -squared, and  $p$ -value further fortified the reliability of our results. The tight scatterplot proved that the association between butter consumption and air quality is as solid as a well-formed pat of butter!

In closing, this study serves as a gentle reminder that, in the world of research, you can never have too much butter. Our findings not only contribute to the "unbuttered" realms of environmental science but also emphasize the importance of taking seemingly unrelated variables with a grain of salt – or butter, in this case. Bon appétit to future researchers as they delve deeper into this dairy-silent connection between food consumption and environmental impact!

## 6. Conclusion

In the wake of our "utterly" surprising findings, it's clear that the link between butter consumption and air quality in York, Pennsylvania is no mere margarine of error. Our study has shown a robust association between these seemingly "unbuttery" variables, highlighting the need for further exploration into the deliciously quirky world of dairy products and environmental impact. This research, while undoubtedly cheesy at times, has churned up vital insights into the potential ramifications of our dietary choices on the air we breathe.

As tempting as it may be to continue spreading our efforts in this area, we are "butter" to declare that no further research is needed in this particular domain. It's time to let this study stand as a testament to the unexpected correlations that can be uncovered when researchers dare to delve into unconventional pairings. We hope our findings have whipped up a sense of curiosity and "battered" up some excitement for the quirky and creamy side of scientific inquiry. After all, who knew that the pathways of science could be so deliciously unexpected?