



# Formative evaluation of a portion control and calorie reduction campaign: Insights from focus groups with target audience

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## ABSTRACT

Healthy eating campaigns can increase awareness of healthful foods and eating patterns and prompt behavior change. Portion control can be a useful strategy in weight management efforts, and new, innovative campaigns can help invigorate messages related to portion control and weight management. This qualitative study presents results of formative testing of portion control and calorie reduction messages and infographics for a proposed campaign. We conducted 17 focus groups with 113 adults ages 18–65 years in 3 US cities. We conducted separate focus groups by weight status (overweight/healthy weight) and gender (male/female) and analyzed coded data and categorized emerging themes. Participants, especially those with healthy weights, gravitated toward specific, and achievable messages to encourage portion control and calorie reduction. Men with overweight and women with healthy weights preferred messages that had a positive, supportive tone. Participants favored messages that addressed overeating and allowed for autonomy. In particular, women and those with healthy weights preferred messages that encouraged calorie budgeting. Many participants, in particular men, provided positive feedback on messages encouraging a “fresh start” on Mondays. Additionally, participants preferred messages that were colorful, informative, realistic, attractive, and relatable. With regard to message dissemination, participants suggested that messages and infographics be positioned in high-traffic areas and men generally suggested places where food decisions are made. Moreover, participants suggested message dissemination through trusted health professionals and credible research organizations. Health organizations planning a portion control or calorie reduction campaign should consider these factors early in the development process to help ensure acceptance and success.

## 1. Introduction

On average, adults in the United States (US) consume a greater than recommended proportion of calories from added sugars, refined grains, sodium, and saturated fats and lower than recommended amounts of fruits, vegetables, and dairy (U.S. Department of Health and Human Services and U.S. Department of Agriculture, 2015). In addition, increasing portion sizes over the years have contributed to increased caloric intake and the obesity epidemic (Livingstone and Pourshahidi, 2014). Over 60% of the US adult population has overweight or obesity (Hales et al., 2018). A healthy diet and appropriate caloric intake, among other factors, are important for weight management and obesity prevention (Grieger et al., 2016). Evidence suggests that portion control or reducing food intake can be effective strategies to help individuals lose or manage weight (Grieger et al., 2016; Kruger et al., 2006), and are commonly cited methods for weight loss (Martin et al., 2018). However, such self-monitoring behaviors may be challenging to continue long-

term. A campaign that promotes periodic assessment and goal resetting can help invigorate messages and encourage the continuation of these behaviors.

Health and nutrition communication campaigns are a useful way to increase awareness and provide a call to action for healthy eating (Noar, 2006; Story et al., 2008). A variety of healthy eating campaigns have been implemented in the US and other developed countries with varying results (Barragan et al., 2014; Maddock et al., 2007; George et al., 2016; Fernandez et al., 2019). Examples of successful campaigns include the Los Angeles County Sugar Pack campaign, which resulted in an increase in intention to change behaviors related to beverage consumption (Barragan et al., 2014), and the 1% or Less Campaign, which resulted in an increase in low-fat milk consumption, both in homogenous and multicultural settings (Maddock et al., 2007). Although these campaigns have documented previous successes, their implementation was time-bound and long-term success was unclear. Additionally, these campaigns have not explored the potential periodicity of health behaviors.

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Previous research has found that individuals tend to engage in health-seeking behaviors on Mondays (Gabarron et al., 2015; Ayers et al., 2014; Ayers et al., 2014), suggesting a missed opportunity to focus campaign messages on Mondays or other notable health-seeking days.

Formative research has been identified as a best practice in the development of health communication campaigns (Noar, 2006). Formative research can help gather audience insights, and allow for campaign tailoring for the optimal delivery of health communication messages. However, few studies have described the results of formative processes that inform the development of effective health promotion messages (Barragan et al., 2014; Berkowitz et al., 2008; Beaudoin et al., 2007). Therefore, the purpose of this study was to conduct formative testing for a proposed calorie reduction and portion control campaign targeting US adults in urban areas. We sought feedback on a number of proposed messages and infographics related to healthy eating, portion control, calorie reduction, and preferences for content focusing on a particular day of the week.

## 2. Methods

### 2.1. Recruitment and sample

A research consulting group conducted a total of 17 focus groups with 113 adults ages 18–65 years in 3 US Mid-Atlantic cities: Baltimore, Washington, DC, and Philadelphia (Table 1). Researchers recruited participants through flyers in various neighborhoods in each city, Facebook advertisements, and a variety of online posts on community pages and listservs. Participants provided informed consent and completed a written survey, providing demographic information and self-reported weight status. Given gender differences in severe obesity (Hales et al., 2020) and diet (Shiferaw et al., 2012; Rolls et al., 1991), researchers conducted separate focus groups by gender (men/women) and weight status (healthy weight and overweight/obese; hereafter referred to as “overweight”) to highlight differences in themes that might emerge between these groups. The campaign secondarily sought to encourage healthy eating habits for a broad audience, therefore, researchers also included the perspectives of individuals with healthy weights. This project was approved by the Johns Hopkins Bloomberg School of Public Health Institutional Review Board.

### 2.2. Focus groups

We developed the focus group guide and associated campaign messages based on findings from a quantitative survey on eating habits and health behaviors among US adults (findings not published) and on information gained from the literature (Barragan et al., 2014). Focus

**Table 1**  
Focus groups.

Location	Weight status and gender	Number of participants
Baltimore	Men with healthy weight	7
Philadelphia	Men with healthy weight	9
Washington, DC	Men with healthy weight	9
Baltimore	Men with healthy weight	6
Baltimore	Women with healthy weight	6
Washington, DC	Women with healthy weight	7
Philadelphia	Women with healthy weight	7
Baltimore	Women with healthy weight	6
Baltimore	Men with overweight	2
Philadelphia	Men with overweight	9
Washington, DC	Men with overweight	8
Baltimore	Men with overweight	5
Baltimore	Men with overweight	5
Baltimore	Women with overweight	5
Philadelphia	Women with overweight	7
Washington, DC	Women with overweight	9
Baltimore	Women with overweight	6

groups were held for 90–120 min, in person, at locations secured by consultants, and were led by a PhD level researcher, with extensive qualitative research experience.

Focus group participants provided feedback on messages and infographics for a proposed campaign to use periodic health messaging cues and encourage Monday as a day to make healthful dietary changes. Additionally, participants provided responses to open-ended questions aiming to understand current health behaviors and beliefs related to portion control and calorie reduction efforts. The first 13 focus groups sought feedback on one set of proposed messages and infographics and the final four focus groups sought additional feedback on a newly created set of messages and graphics. Initial focus group feedback was not considered in the development of the new messages and graphics. Participants from all focus groups responded to the same set of questions regarding current health behaviors and beliefs related to portion control and calorie reductions. We concluded enrollment in focus groups once we achieved saturation of themes. The research team recorded audio for all focus groups and submitted audio files for transcription by a third party.

### 2.3. Analysis

The research team followed the six phases of thematic analysis, described by Braun and Clarke (Braun and Clarke, 2006). Two reviewers independently coded each transcript using Atlas.ti (Scientific Software Development GmbH, 2018). Researchers discussed and agreed on codes, quotes, and relevant themes and discussed connectivity among themes. When reviewers disagreed on the coding of a quote, the team reached consensus through discussion. Results include general trends and counts of theme appearance at the focus group level in an effort to contextualize patterns (Maxwell, 2010). Sampling and analysis procedures do not yield quantitative findings that can be generalized to other settings.

## 3. Results

Our results represent the views of 26 women with healthy weight, 27 women with overweight, 31 men with healthy weight, and 29 men with overweight from 3 cities in the Mid-Atlantic region of the US. Participant demographic data is available in Table 2. Most participants had 4-year college degrees (84%) and were single (84%). Among participants with overweight, the mean age was 37.0 and 39.3 years for men and women, respectively. Most women with overweight (59.3%) also identified as African American/Black, whereas most women with healthy weights (65.4%) identified as White.

### 3.1. Message content

#### 3.1.1. Specific and achievable messages

Participants, especially those with healthy weight ( $n = 5$ , compared to overweight  $n = 2$ ), generally preferred messages with specific directions on how to eat healthy and reduce caloric intake. Many appreciated seeing information that was reasonable, easy to implement, and tailored to their individual situations:

“I like this. ‘Cause it’s kind of like, ‘All right, you can pick out one thing and say what you’re going to take out of your diet.’” [Baltimore man with overweight]

“I picked the plates because it was the most straightforward advice... and it made sense to me.” [Philadelphia woman with healthy weight]

#### 3.1.2. Tone

Most participants did not care for messages that were negatively framed. Those with overweight and those struggling to lose weight seemed overwhelmed and fatigued by a calorie reduction message and did not want to be told what to do. Participants shared their negative

**Table 2**  
Participant demographics.

	Men with Overweight (n = 29)	Men with Healthy Weight (n = 31)	Women with Overweight (n = 27)	Women with Healthy Weight (n = 26)	Total (n = 113)
Age, years	37	32.4	39.3	31.4	
Marital Status, n (%)					
Single	21 (72.4)	24 (77.4)	16 (59.3)	23 (88.5)	84 (0.74)
Married	2 (6.9)	4 (12.9)	6 (22.2)	2 (7.7)	14 (12.4)
Divorced	0	2 (6.5)	4 (14.8)	0	6 (5.3)
Widowed	0	0	0	1 (3.8)	1 (0.9)
Missing	6 (20.7)	1 (3.2)	1 (3.7)	0	8 (7.1)
Race, n (%)					
African-American/Black	12 (41.4)	9 (29)	16 (59.3)	7 (26.9)	44 (38.9)
Asian/PacificIslander	0	5 (16.1)	1 (3.7)	1 (3.8)	7 (6.2)
Native American	1 (3.4)	0	0	0	1 (0.9)
White	9 (31)	15 (48.4)	9 (33.3)	17 (65.4)	50 (44.2)
Multiracial	1 (3.4)	0	0	1 (3.8)	2 (1.8)
Other	0	1 (3.2)	0	0	1 (0.9)
Missing	6 (20.7)	1 (3.2)	1 (3.7)	0	8 (7.1)
Ethnicity, n (%)					
Hispanic/Latinx	0	1 (3.2)	1 (3.7)	1 (3.8)	3 (2.6)
NOT Hispanic/Latinx	23 (79.3)	29 (93.5)	25 (92.6)	25 (96.2)	102 (90.3)
Missing	6 (20.7)	1 (3.2)	1 (3.7)	0	8 (7.1)
Education, n (%)					
Less than High School	0	0	0	0	0
High School/GED	4 (13.8)	3 (9.7)	3 (11.1)	0	10 (8.8)
Some college	4 (13.8)	7 (22.6)	5 (18.5)	8 (30.8)	24 (21.2)
Associate's degree	2 (6.9)	3 (9.7)	0	0	5 (4.4)
Bachelor's degree	12 (41.4)	9 (29)	13 (48.1)	12 (46.2)	46 (40.7)
Master's degree	1 (3.4)	7 (22.6)	5 (16.1)	5 (19.2)	18 (15.9)
Professional Degree	0	1 (3.2)	0	1 (3.8)	2 (1.8)
Doctoral degree	0	0	0	0	0
Missing	6 (20.7)	1 (3.2)	1 (3.7)	0	8 (7.1)

reactions, brought on by messages that conveyed blame or implied guilt. This was especially prevalent among men with overweight (n = 27, compared to men with healthy weight n = 4) and women with healthy weight (n = 30, compared to women with overweight n = 16):

“So today’s bigger portions mean bigger waistlines. I feel like that one’s a bit shaming, just negative. So that’s why I didn’t like it.” [DC woman with healthy weight]

“Being a big guy that’s what you’re told like growing up, like stop stuffing your face. It’s just like, all right, mom...” [Baltimore man with overweight]

### 3.1.3. Autonomy

Many participants across gender and weight groups reacted favorably to messages that allowed for individual empowerment and autonomy:

“...I think a good campaign would be something that empowered people to make those decisions on their own versus being told to eat less. So maybe coming up with some sort of wording that gives them to strength to say... you can make these choices and you should make them because you’ll feel better.” [DC woman with overweight]

### 3.1.4. Healthy alternatives

Participants were also interested in the idea of swapping unhealthy foods for healthier versions and viewed this as one way to allow for autonomy. Participants liked information that provided clear suggestions on how to make healthful changes to usual food choices. Participants highlighted the value of having healthy, suitable options to substitute for unhealthy ones:

“...I like this one because; at least with it they give you a choice. It’s try to eat this instead of this. Try to drink this instead of this... you are not just telling me, ‘Don’t eat this.’... I might not like what they

give me but, at least they give me options.” [Baltimore man with healthy weight]

“Swap outs are important. Recently I discovered a fruit-infused water instead of soda... And I don’t miss sodas and juices much anymore.” [Philadelphia woman with healthy weight]

Though not echoed by a majority of participants, some participants argued that suggested substitutions should provide a similar food or experience compared to the original food:

“... You can’t tell someone, ‘Oh, drop the can, drop the Skittles and then pick up some type of nutritious grain thing or something like that, like a bar or something like that... it’s got to be something that gives you just as much value...as the thing.” [Baltimore man with healthy weight]

### 3.1.5. Calorie budgeting

Many respondents, especially women (n = 10, compared to men n = 6) and those with healthy weight (n = 11, compared to overweight n = 5) liked the idea of budgeting daily calories as a way to reduce intake and achieve or maintain a healthy weight. Some participants liked the idea of having concrete information on calories, others liked that calorie budgeting messages called for moderation, but still allowed for foods that others may think of as forbidden, such as fast food. In response to a message encouraging individuals to stay within a 2,000 calorie limit, participants stated:

“They’re not telling you, don’t eat McDonald’s, it’s like, if you ever want to eat fast food, you can at least eat less of it that can fit into a 2000 calorie budget.” [DC man with overweight]

“I budget all the time... if I pay X amount of dollars for this, that means I have less money to spend later on in the week on food. So I can easily switch that to the calorie count for my 2,000 allotment for the day...” [Baltimore woman with healthy weight]

However, to others, the concept of calories seemed difficult to

interpret:

“I do not like that. Don’t blow your daily 2,000 calories, because just nobody knows they have a 2,000 calorie budget. I will not lie to you, unless you actually know about dieting you don’t know if you have a 2,000 calorie budget.” [Baltimore man with overweight]

### 3.1.6. Fresh start on Mondays

Many respondents, especially men (n = 36, compared to women n = 26, gravitated toward the idea of a fresh start on a Monday. They believed that most people ate more than they should over the weekend, so having the opportunity to start over with healthy eating habits on Monday made the message more relatable and attractive to many focus group participants:

“...I can relate to if you want to start a diet, you mess up on the weekend, and you can start fresh on Monday” [Philadelphia man with overweight]

“...we generally eat more over the weekends, and the first day after the weekend is a Monday. That’s the best day of the week...to kind of take a step back and cut back significantly, for a day, on the amount of food you eat.” [DC man with overweight]

“Sunday is that motivational day ... Every Sunday I make that plan for Monday...” [Philadelphia woman with overweight]

Others believed that a focus on Monday or one day a week might lead people to believe it was acceptable to engage in unhealthy behaviors the rest of the week:

“it feels like it’s encouraging or approving of bad behavior. It’s like, ‘Oh, as long as you make up for it on Monday, you’re okay.’” [DC man with healthy weight]

## 3.2. Graphics

### 3.2.1. Visual appeal

Participants across weight and gender groups also commented on overall visual appeal of messages and infographics. In general, participants positively rated graphics that were colorful, informative, realistic, attractive, and relatable:

“It’s the most graphic... The most colorful, the most, in my opinion, visually [interesting], compelling, etc.... And relatable to the vast majority of people”. [DC man with healthy weight]

### 3.2.2. Realistic and palatable

Many participants also criticized graphics that were not realistic, such as a very large and stacked cheeseburger:

“That triple-decker thing isn’t what people are eating, so just the image itself, it doesn’t relate to me whatsoever. And I wouldn’t think it would relate to a lot of people.” [Baltimore woman with healthy weight]

Additionally, participants cautioned that images should make healthy options look more palatable and unhealthy options look less palatable. Otherwise, they run the risk of encouraging unhealthy food options rather than discouraging them:

“It’s unhealthy food and none of these had any healthy food. So if I was seeing healthy food that was looking really good I would go, ‘Oh, I want to go home and make that.’...but this just makes me want to seek out junk food.” [DC woman with healthy weight]

## 3.3. Message dissemination

### 3.3.1. Location

Several participants believed messages should be placed by fast food restaurants and other high-traffic areas, such as bus stops and waiting areas, as well as online venues, such as social media. Men (n = 24, compared to women n = 10) commonly recommended restaurants and other places where people make eating decisions. The recommendation for dissemination at transportation locations was consistent across weight and gender groups. The following quotes summarize participants thoughts on message dissemination:

“Bus stops, places where you’re waiting for something and not going anywhere... Like subway stations, bus stops, light rail stops, things of that sort.” [DC man with healthy weight]

“Like digital ads online or on your smart phone when you’re reading an article,...because a lot of people are more attached to smart phones than they were five, 10, 15 years ago.” [DC man with healthy weight]

“It just make you double think real quick...outside of any fast food restaurant this would be very effective.” [Baltimore man with overweight]

### 3.3.2. Channel

Women (n = 6, compared to men n = 2) and those of healthy weight (n = 8, compared to overweight n = 0) were more likely to value disseminating calorie reduction messages through trusted health professionals, health-related organizations, or research institutions, highlighting their credibility. Also, women (n = 12, compared to men n = 7) and those with overweight (n = 16, compared to healthy weight n = 3) were more likely to suggest schools or places where young people gathered.

“Maybe if my doctor told me I needed to eat less or cut down on certain foods I would agree with him or her but if my family told me to I’d be pretty pissed...just seems kind of judgmental doesn’t it?... I think I would only trust my doctor for that.” [DC woman with healthy weight]

“A respected research institution that put out a study, or some sort of campaign like this, but I don’t know if I would listen to one of my peers saying this” [Baltimore woman with healthy weight]

## 4. Discussion

In this qualitative study with 113 adults in urban areas, participants generally preferred messages that were specific and achievable, allowed for autonomy, encouraged healthy food and drink alternatives, included calorie budgeting, and encouraged a fresh start on Mondays. Additionally, participants believed messages should include graphics that are attractive and relatable, and that messages should be placed in high-traffic areas, such as fast food restaurants, bus stops, health care professionals’ offices, and on social media. Message acceptance and recommendations for dissemination differed somewhat by weight status and gender.

Focus group participants with healthy weights more often recommended crafting specific and achievable messages, as they may already be health-conscious and interested in specific ways they may improve their health. Previous literature suggests that vague messages may allow consumers to draw their own, sometimes incorrect conclusions (Wilson, 2007), and have not been effective in eliciting changes in behavior, attitudes, or intentions to change (Beaudoin et al., 2007). Messages that allowed for autonomy were also popular among focus group participants. The inclusion of autonomy has been highlighted as a best practice for behavior change techniques for physical activity and healthy eating among overweight adults (Samdal et al., 2017), thus supporting this concept.

Women and individuals with healthy weights gravitated toward messages encouraging calorie budgeting as a way to help reduce caloric intake. Evidence suggests that women are more likely than men to have body dissatisfaction and have attempted weight loss (Crane et al., 2017; Nagata et al., 2020; Tsai et al., 2016), as gender and social norms tend to encourage ideals of thinness among women more than men. As such, it is possible that women have a greater interest in calorie tracking. Menu labeling and calorie tracking are two strategies that have been used for weight loss or weight maintenance (Patel et al., 2019; Pagoto et al., 2013; Bleich et al., 2017). Although there is evidence suggesting that calorie tracking is a component of successful weight loss interventions (Kruger et al., 2006), studies have shown mixed results on the effectiveness of calorie labeling in restaurant menus (Bleich et al., 2017; Ellison et al., 2013). Although many participants provided positive feedback on calorie budgeting messages, some raised concerns regarding the lack of knowledge related to calorie consumption. Evidence suggests that many US adults have limited knowledge and understanding of calories and interpreting calorie labels on foods (Persoskie et al., 2017), which may be counterproductive to weight loss efforts. Messages encouraging calorie budgeting may require additional educational components, such as public education campaigns or information delivery via text message.

Participants also emphasized lower calorie alternatives, in the form of substitutions or portion reduction. Although there is evidence suggesting substitutions can improve weight loss and intake (Grieger et al., 2016; Rolls, 2014), some studies have shown mixed results (Grieger et al., 2016). However, as participants noted, substitutions need to provide a similar experience to be effective. Another challenge participants raised was having to choose between the financial value of low cost/low nutritional value meals and drinks and healthier, appropriately portioned ones. Evidence suggests that low nutritional value foods are often cheaper than nutritionally dense foods, and thus, may be more attractive to individuals of lower socioeconomic standing (Darmon and Drewnowski, 2015). Revised campaign materials, building on formative feedback, should highlight the value of healthy foods.

Many focus group participants agreed that Monday may be a suitable day to start healthy habits, as it marks the beginning of the week for many US adults. Men more often provided positive feedback to messages that included periodic health and diet cues compared to women. Emerging evidence suggests that interest in health behaviors increases on Mondays (Gabarron et al., 2015; Ayers et al., 2014; Ayers et al., 2014) and periodic health cues can be useful to enable health behavior changes (De Leon et al., 2014). Portion control and calorie reduction campaigns may yield greater results if messages provide a regular call to action on a specific day of the week. Gender-specific evidence on the effectiveness of periodic health nudges is lacking and should be further explored.

For optimal campaign dissemination, participants generally recommended the placement of messages in high-traffic areas and also at point of sale to encourage visibility and adoption. The effectiveness of message dissemination in target areas is mixed (George et al., 2016; Shimazaki and Takenaka, 2015), as it likely depends on a number of factors, including the message content, readability, and target audience (Shimazaki and Takenaka, 2015). Participants with healthy weights believed they were already adopting healthy behaviors and tended to prefer receiving information from trusted health professionals or research and health organizations. Conversely, it may be that individuals with overweight already receive constant weight loss messages from healthcare providers, and may have been less inclined to recommend that route of dissemination. Previous studies have highlighted the importance of health professionals in disseminating health and nutrition messages (van Dillen et al., 2003), but it is important to note that multiple channels of dissemination may be a more effective strategy, as experts have pointed out in previous research (Gonzalez-Nahm et al., 2020).

Our study provides audience insights on a proposed portion control and calorie reduction campaign. However, our results should be

interpreted with caution. Although we quantified our results by gender and weight status, these numbers are only intended to contextualize results and discourage any quantitative interpretation. Our study was limited by a small sample size, and lack of diversity in terms of education, age, and ethnicity. We did not stratify results by race/ethnicity; which may have revealed new information for message tailoring. Additionally, our sample was generally younger and more educated than the average US adult and we may have unintentionally recruited participants who were interested in weight loss; therefore, our results may not be representative of all adults in urban areas in the US. Finally, although the focus group moderator was highly trained, it is possible that focus group discussions were influenced by moderator bias.

## 5. Conclusions

Our formative research indicates that US adults in urban areas may be amenable to a portion control and calorie reduction campaign that promotes healthy alternatives, and includes calorie budgeting. Periodic health nudges or cues on Monday may be a promising strategy to bolster message dissemination. For optimal campaign acceptance, messages and dissemination routes may need to be tailored to the target audience, as preferences may differ by gender and weight status. These results provide audience insights that can inform future campaigns aimed at US adults in urban areas, however formative testing is still recommended. Future research should further explore the effectiveness of health communications campaigns with periodic health nudges, with a focus on differences by weight status, gender, and other demographic characteristics, such as race/ethnicity.

## 6. Research data

Data can be made available upon request to the Nurture PI, and with adequate IRB permissions and data-sharing agreements in place.

## Author contributions

SBN conceptualized the study; SGN and MLA analyzed the data; SGN drafted the manuscript, SBN, MLA, SGN reviewed and edited the manuscript; all authors have reviewed and approved the final article.

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## CRedit authorship contribution statement

**Sarah Gonzalez-Nahm:** Formal analysis, Writing – original draft, Writing – review & editing. **Meghan L. Ames:** Data curation, Formal analysis, Writing – review & editing. **Sara E. Benjamin-Neelon:** Conceptualization, Methodology, Resources, Writing – review & editing, Supervision.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.pmedr.2021.101614>.

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