

## REVIEW ARTICLE

# EXPLORING SIGNIFICANCE OF SATVIK AND NON-CAFFEINE DIET VERSUS OTHER DIETS IN RELATION TO SLEEP PATTERNS AND RELATED ASPECTS

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## ARTICLE DETAILS

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## ABSTRACT

Consumption of different food and beverages plays one of the most important role in an individual's health. The type of food we eat and the beverages we consume can impact our bodies and shape our lives in various ways. This study involves two crucial aspects: the impact of diverse dietary patterns and the effects of caffeine consumption on the body. Particularly, it examines the followers of the Krishna consciousness movement, famously also known as the 'Hare Krishna people,' who adhere to a stringent vegetarian diet devoid of onion and garlic, and abstain from any kind of intoxication including caffeine consumption. This questionnaire-based study aims to explore the disparities between the satvik diet (vegetarian, onion and garlic-free) with a caffeine-free regimen, compared to other dietary practices. The study revealed that ratio of people who follow such diets are able to sleep a lesser number of hours naturally while others need longer hours of sleep to feel energetic. It also showed that people following satvik dietary patterns tend to have less issues of acne/breakouts and feel more active in the morning as compared to people following other diets. They were also found themselves to fall asleep faster than other groups who found it hard to fall asleep.

## KEYWORDS

Satvik, Vegan, Vegetarian, Caffeine, Coffee, Diet

## 1. INTRODUCTION

In Western countries, an escalating number of individuals are shifting to vegan and vegetarian diets for a multitude of reasons. This shift has raised scientific inquiries into how dietary choices impact various aspects of life, including lifestyle, bodily functions, sleep quality, and overall health. The relation between diet and sleep quality is particularly emphasized, as they play an important role in ensuring optimal bodily functions and enhancing life productivity and longevity. Notably, the consumption of fast food has also surged significantly in recent years, primarily comprising non-vegetarian options, as well as food containing onion and garlic, and beverages like energy drinks and soft drinks due to time constraints and work pressure. These items collectively constitute the bulk of the junk food prevalent in regular diets. In contrast, adherents of the Krishna consciousness movement worldwide adhere to a strict vegetarian diet devoid of onion and garlic, known as the satvik diet. Additionally, they abstain from all forms of intoxicants, including caffeine. This dietary pattern is the main principle in their spiritual practice and highlights the importance of careful consumption of food for physical and mental well-being.

Consumed by roughly 80% of the population on a daily basis, caffeine stands as one of the most widely consumed psychoactive drug by general population worldwide (Heckman et al., 2010; Fredholm et al., 1999). Despite its widespread use to reduce fatigue and enhance performance<sup>3</sup>, people generally refrain from consuming caffeine in the evening to prevent negative impacts on sleep during the night (Snel and Lorist, 2011; Martyn et al., 2018; Lieberman et al., 2018). Although coffee stands as the most commonly recognized and consumed source of caffeine, it's

important to note that caffeine can also be found in tea, energy drinks, carbonated soft drinks, and cocoa-containing foods like chocolates (Heckman et al., 2010; Mitchell et al., 2014). Upon ingestion, caffeine quickly goes through the gastrointestinal tract, permeating the bloodstream and distributing throughout the body. It functions as an antagonist to adenosine A1 and A2A receptors, which are widely distributed across the central and peripheral nervous systems in the human body (López-Cruz et al., 2018). By inhibiting adenosine receptors, caffeine can affect numerous physiological functions, including metabolism, cardiovascular activity, respiration, neuroinflammatory, neuro-modulatory, and neuroprotective processes (Gomes et al., 2011; Jacobson and Gao, 2006). Specifically, caffeine might induce gastric acid secretion and vasoconstriction, elevate heart rate and blood pressure, increase respiratory rate, and ultimately reduce neurodegeneration. It enhances alertness, wakefulness, psychomotor vigilance and memory, through its influence on NMDA (N-methyl-D-aspartate) receptors as reported previously (Temple, 2017; Liszt, 2017; Cunha and Agostinho, 2010). Moreover, caffeine also functions in mitigating neuroinflammation and providing neuroprotection by regulating extracellular calcium levels, modulating glutamate release and controlling microglial activation (Kolahdouzan and Hamadeh, 2017). However, excessive consumption of caffeine carries numerous health risks including anxiety, panic attacks, psychosis, mania, tension, nervousness, irritability, restlessness, nausea, palpitations, insomnia, and diuresis (Szpak and Allen, 2012).

Caffeine intake in the short term has been associated with a range of physiological and cognitive enhancements, including improved mood and alertness, enhanced exercise performance, an increase in blood pressure, and a better capacity to remain awake and mentally sharp after fatigue

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























(Ferré, 2008; Riksen et al., 2009). Individuals with more sensitivity might manifest adverse effects at lower doses as well compared to individuals with lower sensitivity. Children especially are often classified in the category of sensitive individuals due to their smaller size and developing central nervous system. This is a matter of concern as a significant proportion of children and adolescents are regular consumers of caffeine prevalent in the form of soft drinks and beverages. For instance, a recent study conducted in the United States reported that 73% of children consume caffeine on any given day (Brnum, et al., 2014; Drewnowski and Rehm, 2016). Energy drinks marketed by manufacturers as beverages that enhance performance majorly contain caffeine as their main active ingredient (McLellan and Lieberman, 2012). Current estimates indicate that 30–50% of adolescents and young adults regularly consume caffeine and it has been associated with behavioural problems and a range of serious health complications (Reissig et al., 2009; Seifert et al., 2011). The association between maximal lifetime caffeine consumption and the risk of caffeine-related toxicity and dependence shows a moderate correlation with a broad spectrum of psychiatric and substance use disorders (Kendler et al., 2006). Furthermore, evidence from research also indicates that increased caffeine intake during pregnancy correlates with elevated systolic blood pressure levels (Bakker et al., 2011).

Miller also reported a positive association between the frequency of energy drink consumption among US undergraduates and various risky behaviours, including smoking, illicit prescription, engagement in sexual risk-taking, alcohol consumption, alcohol-related problems, drug and marijuana use, involvement in fights, and seatbelt omission (Miller, 2008). An additional potential mechanism through which energy drinks could provoke adverse health effects is the disruptive impact of caffeine on sleep patterns (Richards and Smith, 2015). The consumption of energy drinks has been associated with daytime sleepiness (Watson et al., 2017).

The term "Sattvic," or "Sattvikam," is recurrent in numerous Hindu scriptures related to Yoga, where it conveys the essence of being "in the mode of goodness" in English (Prabhupada and Swami, 1972). Chapter seventeen of the Srimad Bhagavad-gita, explains that different foods fall into three groups, corresponding to the qualities of goodness (Sattva), passion (Rajas), and darkness (Tamas) in material nature (Prabhupada and Swami, 1972). In the following three verses, it is explained that foods categorized as "goodness" promote a longer life, cleanse one's being, and provide vigor, well-being, joy, and contentment. Such nourishing foods are typically sweet, juicy, rich, and enjoyable. On the other hand, foods favored by those in the "passion" category are often bitter, sour, salty, spicy, dry, and hot. These foods tend to bring discomfort, suffering, and illness. Additionally, food that has been cooked excessively beforehand, lacks taste, is stale, rotten, decomposed, or unhygienic is preferred by those influenced by ignorance (Prabhupada and Swami, 1972). The book explains in its texts the importance of food in three different categories can influence one's consciousness which might also explain the different sleeping patterns and body functioning. A few studies have reported the food items and these are mentioned in Table 1.

Table 1: Classification of food sources	
<b>Satvik</b>	Cereals, whole grain bread, fresh fruits and vegetables, pure fruit juices, milk, butter and cheese, legumes, nuts, seeds, sprouted seeds, honey and herbal tea (Suresh et al., 2020). Curd, ghee, buttermilk (Kulkarni, 2023). Milk products, sugar, rice, wheat, fruits and vegetables such as baked corn and molasses, milk and milk products, a leaf, fruit, flowers and water grains (Prabhupada and Swami, 1972).
<b>Rajasik</b>	Overly mixed with red pepper, coffee and tea, fish, spicy foods, eggs, salt and chocolates, Jams, jellies, pickles, Soda, cola, wine, Fried food, sour milk and cream (Prabhupada and Swami, 1972; Suresh et al., 2020; Kulkarni, 2023).
<b>Tamasik</b>	Meat, fish, eggs, liquor, stale food, alcohol, tobacco, onions, garlic, fermented foods such as vinegar, stale overripe substances, flavoured and preserved canned food (Prabhupada and Swami, 1972; Suresh et al., 2020; Kulkarni, 2023).

In Vedic literature, food or diet is grouped into three main categories: Satvik, Rajasik, and Tamasik (Figure 1). A small description of the three types of food is mentioned below.

	EFFECTS ON BODY AND MIND	CHARACTERISTICS OF FOOD
<b>MODE OF GOODNESS</b>	 INCREASES ENERGY  CHEERFULNESS  SERENITY  MENTAL CLARITY	 FRESH  JUICY  LIGHT  UNCTUOUS  NOURISHING  TASTY
<b>MODE OF PASSION</b>	 CREATE JEALOUSY  ANGER  DELUSION  FANTASIES  EGOTISM	 BITTER  SOUR  SALTY  PUNGENT  HOT  DRY
<b>MODE OF IGNORANCE</b>	 INCREASE PESSIMISM  LAZINESS  DOUBT	 STALE  HEAVY  HALF COOKED  OVERCOOKED

**Figure 1:** Food described according to the three modes of nature

According to the mode of the food, it provides the different behavioral patterns and qualities to the person consuming it.

## 2. SATVIK FOOD (FOOD IN THE MODE OF GOODNESS)

Satvik food, known as food in the mode of goodness, is a non-stimulating vegetarian diet. It includes fresh seasonal vegetables (excluding garlic and onion), dairy products like milk, yogurt, and ghee, seasonal fruits and juices, natural sweeteners such as honey and dates, grains like rice and oats, nuts, legumes, vegetable oils, and spices like turmeric and ginger. People who follow a satvik diet typically prefer this kind of food because it promotes mental balance and health. It's believed that consuming satvik food enhances positive qualities like energy, goodness, happiness, and a caring attitude, leading to peace of mind.

## 3. RAJASIK FOOD (FOOD IN THE MODE OF PASSION)

Rajasik food, also known as food in the mode of passion or the "king's diet," is characterized by its spicy, flavorful, and stimulating nature. This type of food provides energy for active tasks and stimulates the entire system, especially the nervous system. Rajasik foods include starchy and fried items like fast food, junk food, and fermented foods. They are typically spicy, hot, bitter, sour, and pungent, containing ingredients such as red chili, soda, pickles. Rajasik individuals are known for their high energy, boldness, and aggressive pursuit of goals. They tend to be self-centered and focused on the future, often displaying artificial affection. Due to their preference for negative foods, they may experience health issues like hyperacidity, obesity, arthritis, diabetes, depression, and anxiety.

## 4. TAMASIK FOOD (FOOD IN THE MODE OF IGNORANCE)

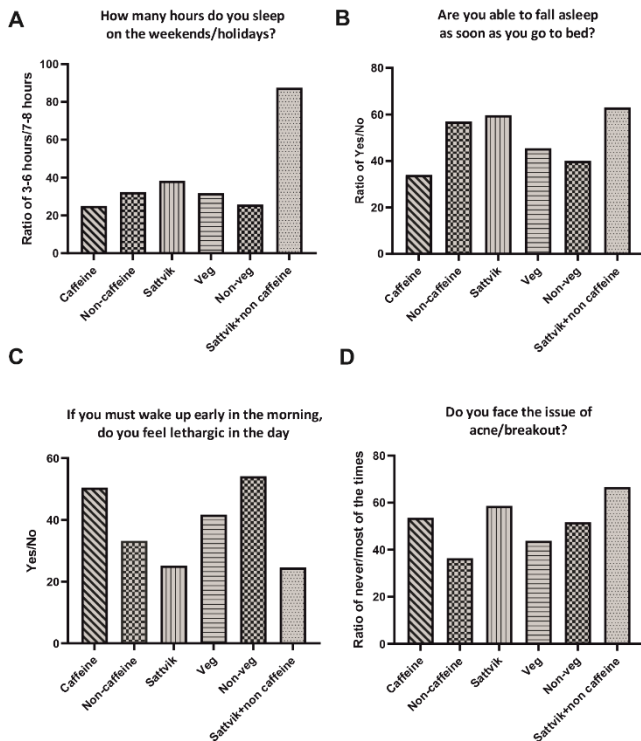
Tamasik food or food in the mode of ignorance, known for its association with the darker aspects of personality, includes non-vegetarian, oily, and fried items. This category comprises red meat, chicken, fish, as well as vegetables such as onion, garlic, and mushroom. Additionally, it encompasses fermented or chemically processed foods like vinegar and preservatives, bakery products like cakes and bread, alcoholic beverages,

recreational drugs, leftovers, stale and over cooked meals, fried and burnt dishes, frozen and canned foods, and refined grains (Turner, 2013).

Individuals with a Tamasik personality tend to experience mental sluggishness, confusion, laziness, and ignorance. They often exhibit regressive behavior and are more prone to mood swings. Despite showing strong emotional attachments, they can be easily dominated by others. Tamasik individuals may age faster and typically require longer periods of sleep, often exceeding eight hours. Common characteristics of this personality type include anger, anxiety, frustration, aggression, and boredom.

## 5. RESULT AND DISCUSSION

The analysis delving into the dietary habits of Satvik diet adherents and non-caffeine consumers, juxtaposed against other dietary patterns, was conducted through a comprehensive questionnaire. Over 500 responses were gathered via a Google Form, and the ensuing data was automatically collated within an MS Excel Sheet. Upon analysis of the questionnaire, it was shown that individuals who partake in a Satvik diet supplemented by non-caffeine intake tend to exhibit a higher ratio of those sleeping 3-6 hours on weekends compared to those obtaining 7-8 hours of sleep. In contrast, individuals adhering to a non-Satvik diet coupled with caffeine consumption demonstrated the converse, indicating long sleeping hours for those not following the Satvik and non-caffeine dietary patterns (Figure 2A). This is an important observation as besides SNC (Satvik, non-caffeine) consumers, none of the rest of the group of consumers showed fewer sleeping hours which indicates it is imperative for the individual to follow both non caffeine as well as satvik diets (SNC) in order to have less sleeping duration naturally and without any ill effects. This phenomenon could be attributed to the simplicity of the Satvik diet components facilitating digestion, coupled with the absence of caffeine, thereby fostering conducive conditions for proper sleep cycles. It is important to note that some of the studies reveal that long sleep hours (around 8 hours or more) is beneficial for the body and mind<sup>29,30</sup>, but it is imperative to note that people following Krishna conscious diet patterns experience less sleep naturally due to lesser needs of the body (easier digestion and no dependence on caffeine) and thus can be more productive (Kim and Lee, 2018; Heslop et al., 2002). However, it requires further investigation and research to shed light on this matter more clearly.



**Figure 2:** Questionnaire analysis from the responses received from 500+ participants.

Graphs representing analysis of results of people consuming Satvik and non-caffeine (SNC) diets as compared to other (Caffeine, Non-caffeine, Satvik, Veg, Non-veg diets) in relation to sleep patterns and other factors. The statement above the graphs represents the particular question from the questionnaire.

Caffeine has been reported to be responsible for the delay of sleep onset and cause the individual to face short term-insomnia<sup>31,32</sup> and besides the occasional consumption, regular intake of the product is also the cause for irregular REM sleep cycles in individuals, resulting in delayed circadian REM sleep promotion (Drake et al., 2013; Bonnet and Arand, 1992). The effects of caffeine is known to prolong sleep latency and reduce the deep sleep duration (Weibel, 2021; Drake et al., 2013; Bonnet and Arand, 1992; Carrier, 2007; Drapeau, 2006; Robillard et al., 2015). In our study, the analysis revealed individuals consuming non-caffeine and Satvik diets exhibited a higher ratio of those able to fall asleep promptly compared to those encountering difficulties in falling asleep. According to the result, delay of onset of sleep was observed maximum in the consumers of caffeine followed by non-vegetarian diet consumers (Figure 2B). This was followed by vegetarian diet consumers. The population with non-caffeine and satvik diets were amongst the most successful in falling asleep on time with SNC, Satvik and non-caffeine consumers showing the highest number of people with no delay of onset of sleep. This implies that individuals who consume caffeine and follow non-Satvik dietary patterns are more prone to sleep onset difficulties (Figure 2B). This observation highlights the notion that the absence of caffeine along with consumption of food in the mode of goodness (satvik) in the body system may facilitate smoother transitions into sleep.

Moreover, it was noted from the responses that non-vegetarian consumers reported the highest incidence of daytime lethargy, closely followed by caffeine consumers. Conversely, individuals adhering to a Satvik diet exhibited the lowest incidence of daytime lethargy (Figure 2C). Questionnaire revealed SNC consumers to be the least lethargic in the morning, followed by Satvik consumers which was followed by NC (Non caffeine) consumers. Vegetarian diet consumers came in fourth and non-vegetarian and caffeine consumers were the most affected with majority individuals facing lethargy in the morning. Satvik-vegetarian diet has been previously reported to help athletes who face heavy exertion, as the diet with high amounts of fruits, vegetables and whole grains provide suitable antioxidants in opposition to the free radicals generated during exercise (Nieman, 1999). The foods mentioned in the aforementioned study concerns with satvik diet (fruits, vegetables, whole grains). In addition, this type of diet is also associated with long term health benefits and decrease in the possibility of occurrence of chronic diseases (Nieman, 1999).

Additionally, the questionnaire revealed that individuals adhering to Satvik and non-caffeine diets experienced fewer issues of acne/breakouts on their skin compared to other dietary groups (Figure 2D). This was followed by Caffeine and Non-vegetarian diet consumers and the least by non-caffeine consumers. These findings resonate with existing research highlighting the adverse effects of caffeine consumption on overall health, particularly its impact on sleep quality. In addition, a plant-based diet is helpful in counteracting effects of skin diseases such as acne, atopic dermatitis and psoriasis (Fusano, 2023). It was also reported in existing studies that skin issues like atopic dermatitis is more prominent and prevalent in children and teenagers who consume fast food and meat burgers, which fall under the category of rajasik and tamasic diets (Cho et al., 2020; Ellwood, 2013; Wang, 2018).

## 6. METHODOLOGY

A quantitative survey, comprising 20 questions with multiple-choice options, was developed to study the effect of different diet patterns on general population undertaken in the study. Utilizing Google Forms, the survey was efficiently administered to a number of 500+ (509) participants. The participants were of different age groups falling between less than 20 to above 50 years old, with majority of the participants falling in the range of 20-35 years of age. The participants included female and male participants. The forms were shared on online social media platforms where random people could fill in their details and answer the questions asked in the survey. The responses were recorded automatically by Google forms and compiled in an MS Excel Sheet for subsequent analysis. The study's primary objective was to discern correlations between various dietary patterns and their impact on sleep quality, prevalence of diseases, daily lifestyle, and other pertinent factors. Through the analysis of the amassed data, insights were gleaned into the nuanced interplay between diet and its multifaceted effects on overall well-being.

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## COMPETING INTEREST STATEMENT

No conflicts of interest are associated with the contents of this article.

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## DATA AVAILABILITY STATEMENT

Data received from the questionnaire and analysis of data can be made available upon request.

## AUTHOR CONTRIBUTIONS STATEMENT

Conceived the study- SP, GM, CP

Data generation, interpretation- GM, CP

Manuscript writing and review- GM, CP, KM, HS

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