



Sattu, the Indigenous Cold Drink of Bihar: Nutritional, Health and Economic Facts

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

In order to keep active and healthy during the summer, we must constantly hydrate our bodies. With the heat waves and blistering sun draining every ounce of energy from our bodies, it's crucial to keep track of how we can start the day so that we have enough energy to get through the day. Sattu is an excellent way to begin the day. The nutrient-dense food item can be turned into a sharbat and eaten on an empty stomach or after a sufficient gap from the previous meal. Sattu, which is high in calcium, iron, and fiber, aids in blood circulation and inflammation reduction. It also aids in the strengthening of hair and the improvement of skin quality. Daily consumption of sattu aids in the control of blood sugar levels and the regulation of blood pressure. Sattu is a low-glycemic-index food that is beneficial to diabetics. It is good for persons with high cholesterol because it is high in fiber.

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1. INTRODUCTION

In South Asia, Bengal gram is known as Chickpea or Gram (*Cicer aritinum* L.), but in the developed world, it is known as Garbanzo bean. Bengal gram is a prominent pulse crop in India, where it has been widely produced for generations; around 70% world production comes from India making it the world's largest producer. Bengal gramm is commonly regarded as a nutritious food. It's a high-protein addition to cereal-based diets, especially for the poor in developing nations who are vegetarians or can't afford animal protein (Rampal, 2018).

There are many uses of Bengal gram in Indian kitchen. It is widely used in making "Sattu" popular in Bihar and eastern Uttar Pradesh. In English, Sattu is known as Roasted Gram Flour or Roasted Bengal Gram Flour. Sattu is a Hindi term, and most Hindi-speaking states in India refer to it as such. In Odisha, it's known as Chhatua. It is known as Sattu Pindi in Telangana/Andhra Pradesh, Cattu Mavu in Tamil Nadu.

Sattu is an Indian delicacy. It is roasted pulse or cereal flour that is used as a ready snack meal in northern India, especially in rural areas. It's traditionally made using roasted cereals like barley, maize, or roasted Bengal gram, or a combination of these. The dry powder is used as a primary or secondary ingredient in a variety of recipes. The practise of making Sattu is centuries old and famous across India, notably in Bihar. Sattu is often referred to as "poor man's protein." It is the most recent food to become popular and regarded as a superfood. Sattu has several health advantages and may be used in a variety of easy and tasty recipes. It is high in nutrients and is known as the "energy powerhouse." (Fatma et al., 2017).

Sattu is known as Saktu in Ayurveda, and its medicinal virtues have been mentioned in many Ayurvedic dictionaries. Saktu is a powder made from roasted and dehusked Yava (barley), according to Ayurvedic scriptures.

1.1 Objectives

- To understand the benefits and uses of Sattu.
- To find out the most suitable and nutritious and budget friendly drink with the help of literature reviews.

2. HISTORY

The origins of Sattu are shrouded in mystery. However, one common thread that runs across all of the accounts is that it was heavily consumed during wartime due to its longevity, ease of consumption, and energy-giving ingredients. Sattu is said to have originated in Tibet, where it is known as "Tsampa." It was thought to be a must-have for monks on their quest for enlightenment.

It is one of the holy foods mentioned in the Quran and is known in Arabic as 'Saweeq' (barley Sattu). According to folklore, Prophet Muhammad stopped in a village on his journey from Khyber. "Whatever food a guy has, he should bring it to us," he stated to one of his disciples in the morning. The food served to him was 'hais,' a delectable, satisfying, and nourishing dish consisting of dates and 'saweeq.' It was rapidly used as a wedding favour and a component of the ration carried by Arab traders.

2.1 Health Benefits

2.1.1 Bowel movement and healthy digestion

Sattu has high fiber content and low sodium content. As you may be aware, sodium promotes bloating, and Sattu has a very low sodium content. As a result, it eliminates the possibility of gastric development. Fiber is also insoluble. As a result, the food is forced from the stomach to the intestine for further processing. This aids the intestine in maintaining a healthy bowel movement. Sattu aids bowel movement and eliminates digestion and stomach problems as a result. This is why those who suffer from constipation should include Sattu in their normal diet.

2.1.2 Sattu aids weight loss

Sattu improves the digestive system and boosts the body's metabolism because it is low in sodium and high in protein. As a result, it aids in the loss of unwanted pounds.

2.1.3 Nearly zero cholesterol

Sattu is beneficial for persons with high cholesterol and high blood pressure because it has nearly no cholesterol.

Table 1. Nutritional value of sattu

| S.I. | Nutritional value of Sattu | Per 100g |
|------|---------------------------------|----------|
| 1. | Energy | 413 kcal |
| 2. | Carbohydrates | 64 g |
| 3. | Sugar | 20g |
| 4. | Protein | 25 g |
| 5. | Fat (Mono + Poly + Saturated) | 5.50 g |
| 6. | Sodium | 0.27g |
| 7. | Cholesterol | 0g |
| 8. | Fiber | 18g |

Sources: <https://www.24mantra.com/blogs/health-and-nutrition/health-benefits-of-drinking-sattu-before-workout/>

2.1.4 Low glycemic index

Sattu has an extremely low Glycemic Index, which has been scientifically established. As a result, it is an ideal diet for diabetics.

2.1.5 Cooling effect

Sattu, as previously said, has a revitalizing effect and aids in the regulation and maintenance of body fluid. As a result, it keeps you cool in the summer and even helps you avoid sunstroke and dehydration.

2.1.6 Enhances appetite

Sattu increases hunger when consumed on an empty stomach. The presence of potassium and magnesium stimulate appetite.

2.1.7 Detoxifying agent

Sattu contains cleansing effects and flushes out impurities. Consuming it on a daily basis keeps you healthy and protects you from a variety of illnesses.

2.1.8 Rich in minerals

Sattu, which is high in iron, is used to treat hair loss and skin problems.

2.1.9 Rich in protein

Sattu is a good source of plant protein; 100 g may provide 25 g of protein.

(Sources: <https://www.healthshots.com/healthy-eating/nutrition/i-used-good-old-sattu-powder-as-a-protein-shake-and-it-really-does-work/>)

(Business & Facility, n.d.)

2.2 Processing of Sattu

The processing parameters for manufacturing sattu are optimized. Soaking the grain prolonged

the roasting time while improving flavor and color. Chickpeas are best when they have about 30% moisture in them. Grains benefit from a 5-minute roasting time. With an appropriate product, a dehulling efficiency of roughly 75% may give 92 percent. (Dabas et al., 2005)

2.3 Soaking-Drying-Roasting-Hulling-Grinding

2.3.1 How to make sattu at your own home

If you prefer a homemade Sattu, you can make it yourself. Simply follow the steps below:

Bengal gram is soaked in water and dried in the sun for sattu, and then roasted in a cast-iron wok on a wood-fired chulha (burner), with the wok partially filled with sand and Bengal gram toasted in it. The sand provides consistent heat dispersion and removes all moisture from the bean while preserving its nutrients. The husk and the roasted gram are then ground together. This cooking method gives the final product an earthy flavor and scent, as well as extending its shelf life.

2.4 Most Famous Dishes Made from Sattu as an Ingredient

2.4.1 Litti chokha

A culinary identity of Bihar, this dish is made by making mixture of Sattu with spices and herbs stuffed in wheat flour dough, roasted on the live fire of coal and dipped in clarified butter. The dish is a long lasting snack for train journey, evening snack or a morning energy food eaten with chokha.

2.4.2 Sattu paratha

Stuffing of sattu with spices and herbs is prepared stuffed in wheat flour dough and rolled in paratha shape and cooked with clarified butter. The dish is often made on festive seasons.

Table 2. Price comparison

| Item | Brand | Qty | Price (INR) | Frequency | Cost/Unit (INR) | Serving Quantity Sources |
|-----------------------|--------------|---------|-------------|----------------|-------------------------------|---|
| Soft drinks | Coca Cola | 1 L | 65 | 4 (250ml each) | 16.25 | Personal Observation |
| Packaged Fruit Juices | Real Orange | 1 L | 104 | 4(250ml each) | 26 | Personal Observation |
| Milk | Amul Gold | 1 L | 57 | 4(250ml each) | 14.25 | Personal Observation |
| Energy Drink | Red Bull | 250 ml. | 136 | 1 | 136 | Personal Observation |
| Protein Supplement | Protinex | 1 kg | 523 | 29 (35gm each) | 18.03 (in case milk used= 32) | https://www.protinex.com/product/protinex-original/ |
| Sattu | Rakesh Sattu | 200 gm | 36 | 3 | 12 | https://www.rakeshgroup.com/index.php?route=information/recipesinfo&path=22 |

2.4.3 Sattu as refreshing drink

The months of April-May are the season of heat waves in Bihar and UP. Vendors with clay pots wrapped with moisten red muslin cloths filled with sattu drink is often seen on the streets.

The drink can be made both sweet and savory. The savory drink is made from chopped onions, tomatoes, coriander, dry mango powder, salt, green chili and Ice while sweet variation is sweetened either by Jaggery or sugar.

2.4.4 Other uses of sattu are in making of:

- Sattu Puri
- Sattu Laddoo
- Sattu Barfi
- Sattu Halwa

3. LITERATURE REVIEW

3.1 Effects of Soft Drink Consumption on Nutrition and Health: A Systematic Review and Meta-Analysis

In their study, Lenny R. Vartanian, PhD, Marlene B. Schwartz, PhD, and Kelly D. Brownell, PhD found the fact that soft drinks provide energy with little nutritional value, displace other nutrient sources, and are associated to several critical health disorders such as diabetes adds to the case for reducing soft drink consumption. (Vartanian et al., 2007).

3.2 Fruit Juices: Are They Helpful or Harmful? An Evidence Review

Carrie H. S. Ruxton and Madeleine Myers in their study compared evidence from research looking into potential health risks associated with Fruit juices against evidence from studies looking into potential health benefits. Despite its status as a source of free sugars, Fruit juices appear to be linked to advantages rather than hazards, particularly in terms of vascular health and nutrient sufficiency (Ruxton & Myers, 2021).

3.3 Milk Consumption and Multiple Health Outcomes: Umbrella Review of Systematic Reviews and Meta-Analyses in Humans

Xingxia Zhang, Xinrong Chen, Yujie Xu, Jie Yang, Liang Du, Ka Li, and Yong Zhou in their meta-analyses have looked into the link between milk consumption and a variety of health outcomes. Milk consumption is found to be beneficial to human health in this review. Our findings suggest the inclusion of milk in a healthy diet. Their study also discussed on milk allergy and lactose intolerance. (Zhang et al., 2021) <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1829363/>

3.4 Energy Drink Consumption: Beneficial and Adverse Health Effects

Ahmed Abdulrahman Alsunni, MBBS, PhD studied several researches on the behavioral

effects of energy drinks containing caffeine, glucose, taurine, and vitamins, among other ingredients. During three sessions, a double-blind, randomized crossover study was conducted to measure grip strength, vertical jump, and anaerobic power. There was no significant difference in each performance test, demonstrating that energy drinks had no influence on physical performance.

Sugar levels in energy drinks typically range from 21 to 34 g per ounce. Sucrose, glucose, and high fructose corn syrup are the main sugar sources. As a result, consuming a lot of high-energy drinks may raise your risk of obesity and type 2 diabetes. (Alsunni, 2015, <https://www.bigbasket.com/auth/login/?nc=close>, <https://www.rakeshgroup.com/chana-sattu>).

3.5 Protein Supplements: Pros and Cons

Jay Rabindra Kumar Samal & Indira R. Samal in their research found that protein supplements are processed materials that frequently lack other vital elements needed to maintain a healthy lifestyle. It is recommended that the required protein intake be obtained through natural food sources, with protein supplementation being used only if adequate protein is not available in the usual diet. Supplements may cause a reduction in vitamin and mineral consumption, as well as cardiac, renal, bone, and liver problems.

4. CONCLUSION

Apart from its unique nature and enormous benefits, desi Super food Sattu is yet to reach its height of fame. It is still believed to be concentrated primarily in states such as Bihar, Jharkhand, Uttar Pradesh, and West Bengal.

Although it has begun to build a name for itself in the global market, which is a good thing, much work remains to be done in order for it to compete with other luxury Superfoods such as Spirulina and Berries. Its reputation as peasant cuisine may be holding it back, but it is also its selling point, making it extremely popular among Indian households.

After reviewing some famous nutritional drinks sattu seemed to be one of the cheapest option available another reason which makes sattu unique among other drinks is its benefits and ready to use feature. Other drinks have notable side effects like type 2 diabetes chances and other life style diseases.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of this manuscript.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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