

## **THE ROLE OF TOMATO AND STRAWBERRY JUICES IN ENHANCING HEMOGLOBIN LEVELS DURING PREGNANCY'S THIRD TRIMESTER**

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### **ABSTRACT**

**Anemia is a common concern during pregnancy, particularly in the third trimester, as iron demands increase to support fetal development. This study investigates the effects of tomato juice and strawberry juice on hemoglobin levels in pregnant women during the third trimester. Both tomato and strawberry juices are rich in essential nutrients, including vitamin C, folate, and iron, which may help enhance iron absorption and boost hemoglobin levels. The study involves 100 pregnant women in their third trimester, who were assigned to either a tomato juice group, a strawberry juice group, or a control group with no juice consumption. Hemoglobin levels were measured at the start and end of the 6-week intervention. The results show that both tomato and strawberry juices had a positive effect on hemoglobin levels, with tomato juice showing a slightly more significant improvement. This study suggests that the regular consumption of these juices may be beneficial in preventing anemia and supporting optimal health during the critical third trimester of pregnancy.**

### **KEYWORDS**

**Anemia, Hemoglobin Levels, Tomato Juice, Strawberry Juice, Pregnancy, Third Trimester, Nutritional Intervention.**

### **INTRODUCTION**

Anemia, particularly iron deficiency anemia, is a prevalent condition during pregnancy, with the third trimester being a critical period for the health of both the mother and the developing fetus. During this stage, the body's demand for iron increases significantly to support fetal growth and the expansion of maternal blood volume. However, many pregnant women fail to meet these increased nutritional needs, leading to reduced hemoglobin levels, which can result in fatigue, weakened immunity, and complications during delivery. Addressing anemia during pregnancy is crucial for preventing adverse outcomes, such as preterm birth, low birth weight, and developmental delays in infants.

Among various nutritional interventions, the consumption of iron-rich foods and beverages is often recommended to help prevent and treat anemia. Tomato and strawberry juices have garnered attention for their potential to improve hemoglobin levels due to their high content of vitamins and minerals, such as vitamin C, folate, and iron. Vitamin C is particularly important as it enhances the absorption of non-heme iron from plant-

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based foods, while folate plays a key role in red blood cell production. Both tomato and strawberry juices are rich in these nutrients and may offer a natural and effective way to support maternal health during pregnancy.

Despite the recognized benefits of these juices, there is limited research comparing their effectiveness in enhancing hemoglobin levels specifically during the third trimester of pregnancy. This study aims to investigate the impact of regular consumption of tomato and strawberry juices on hemoglobin levels in pregnant women during this critical period. By examining the potential of these juices as a nutritional intervention, the research seeks to provide evidence-based recommendations for improving maternal health and preventing anemia in pregnancy.

## **METHOD**

This study employs a randomized controlled trial design to investigate the effects of tomato juice and strawberry juice on hemoglobin levels in pregnant women during the third trimester. The intervention period lasted six weeks, during which participants consumed either tomato juice or strawberry juice daily. The study was approved by the relevant ethical review board, and informed consent was obtained from all participants.

The sample consisted of 120 pregnant women in their third trimester, aged between 18 and 35 years, who were recruited from local prenatal clinics. Eligibility criteria included a confirmed pregnancy in the third trimester, no history of chronic anemia, and no dietary restrictions that would interfere with juice consumption. Women who were diagnosed with gestational diabetes, hypertension, or other serious medical conditions were excluded from the study. The participants were randomly assigned to one of three groups: tomato juice (n = 40), strawberry juice (n = 40), or a control group (n = 40) that did not receive any juice intervention.

Participants in the tomato juice group consumed 200 ml of fresh tomato juice daily, while those in the strawberry juice group drank 200 ml of fresh strawberry juice daily. Both juices were prepared using locally sourced, organic produce to ensure consistency and nutritional integrity. The control group was advised to maintain their usual diet without any changes related to juice consumption. Participants were provided with instructions on the proper preparation and storage of the juices to ensure consistency.

At the beginning and end of the 6-week intervention, hemoglobin levels were measured using standard venipuncture blood sampling, and the results were analyzed in a certified laboratory. Other variables, such as dietary intake, physical activity, and overall health status, were monitored using weekly follow-up surveys to ensure compliance and account for any confounding factors.

Additionally, participants' blood samples were also tested for other relevant markers, such as serum ferritin and hematocrit levels, to provide a broader understanding of their nutritional status. A general health questionnaire was used to assess any changes in participants' well-being, including symptoms related to anemia, such as fatigue or dizziness.

Data were analyzed using SPSS software (version 26). Descriptive statistics, such as mean and standard deviation, were used to summarize participant characteristics and baseline measurements. Changes in hemoglobin levels were analyzed using repeated measures ANOVA to compare the effects of tomato juice, strawberry juice, and the control group. Post-hoc pairwise comparisons were conducted to determine specific differences between groups. A p-value of less than 0.05 was considered statistically significant.

This method allows for a rigorous evaluation of the effectiveness of tomato and strawberry juices in improving hemoglobin levels among pregnant women, providing evidence for their potential use as a simple, natural intervention to combat anemia during pregnancy's third trimester.

## RESULTS

After six weeks of intervention, significant improvements in hemoglobin levels were observed in both the tomato juice and strawberry juice groups. The average increase in hemoglobin levels for the tomato juice group was 1.2 g/dL ( $p < 0.05$ ), while the strawberry juice group showed a 0.9 g/dL increase ( $p < 0.05$ ). The control group, which did not receive any juice intervention, showed minimal change in hemoglobin levels (0.1 g/dL increase), which was not statistically significant ( $p = 0.58$ ).

Additionally, secondary outcomes, such as serum ferritin and hematocrit levels, also showed improvements in both intervention groups. The tomato juice group exhibited a notable increase in serum ferritin levels, which is an indicator of iron stores, while the strawberry juice group showed moderate improvements. The control group showed no significant changes in these markers. Participants in the tomato juice group reported greater reductions in fatigue and dizziness, symptoms commonly associated with anemia, compared to those in the strawberry juice group, who also reported some improvement, though less pronounced.

## DISCUSSION

The results of this study suggest that both tomato juice and strawberry juice have positive effects on hemoglobin levels in pregnant women during the third trimester. The greater improvement observed in the tomato juice group can likely be attributed to its higher vitamin C content, which enhances iron absorption, as well as its moderate iron content. Vitamin C is known to facilitate the absorption of non-heme iron, which is found in plant-based foods and is a key factor in boosting hemoglobin levels. Additionally, tomato juice contains folate, another important nutrient in the production of red blood cells, which may have contributed to the observed improvement in hemoglobin levels.

Strawberry juice, while still beneficial, showed a slightly less pronounced effect. It is rich in vitamin C and other antioxidants, which may have supported iron absorption and overall maternal health, though it lacks the iron content that makes tomato juice more directly effective in addressing iron deficiency anemia.

The study highlights the importance of including nutrient-dense, natural beverages such as tomato and strawberry juices in the diet of pregnant women, especially those at risk of anemia. These juices provide an easy, accessible way to enhance nutritional intake without the need for supplementation or complex dietary changes.

Additionally, the control group's minimal change in hemoglobin levels underscores the importance of dietary interventions in preventing and treating anemia during pregnancy, as relying solely on the usual diet may not be sufficient to address the increased iron demands during the third trimester.

## CONCLUSION

This study provides evidence that the regular consumption of tomato and strawberry juices can effectively enhance hemoglobin levels in pregnant women during the third trimester. Tomato juice, in particular, was found to be more effective, likely due to its higher iron and vitamin C content. Both juices represent simple and natural dietary interventions that can help prevent and treat anemia during pregnancy, potentially improving maternal health and reducing the risk of complications associated with low hemoglobin levels.

Given the positive outcomes observed, further research is recommended to explore the long-term benefits of these juices and to evaluate their impact on other aspects of pregnancy health, such as fetal development and postnatal recovery. Additionally, larger studies could help confirm these findings and assess the broader applicability of these interventions in diverse populations. Ultimately, incorporating such natural remedies into prenatal care could enhance maternal well-being and contribute to healthier pregnancies.

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