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## Food habits of farm women and their hemoglobin level

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**ABSTRACT:** A balanced diet and the consumption of quality food can contribute to sustain the physical well-being and mental stability of individual. Hemoglobin is a human body protein present in erythrocytes. The amount of hemoglobin less than normal level is called anemia. Village and sample of 40 farm women were selected randomly for the assessment. Socioeconomic data and eating habits were obtained from interview. The hemoglobin level was measured by clinical laboratory testing of blood samples of the respondents. Nearly half of the respondents were young age group (47.50%), can read and write (30.0%), having nuclear family (52.50%), medium size family (50.0%), mixed type of house (60.0%), agriculture as main family occupation (100.0%), monthly family income range between Rs.5001-10000/-(52.50%), bamboo and clay made structure for grain storage (90.0%) and rice/wheat consumption pattern (100.00%). More than half of the respondents (57.50%) having low hemoglobin concentration and having non-vegetarian food habit (90.0%) and more than half of respondents (52.50%) of non- vegetarian were having low hemoglobin concentration.

**Key words:** Anemia, food habits, farm women, hemoglobin, vegetarian

Eating a balanced diet is vital for good health and wellbeing. Food provides our bodies with the energy, protein, essential fats, vitamins and minerals to live, grow and function properly. We need a wide variety of different foods to provide the right amount of nutrients for good health. Nutrition science interprets the interaction of nutrients and other substances in food in relation to maintenance, growth, reproduction, health and disease of an organism. It includes food intake, absorption, assimilation, biosynthesis, catabolism and excretion. In humans an unhealthy diet can cause deficiency- related diseases such as blindness, anemia, scurvy, preterm birth, stillbirth and cretinism, or nutrient excess health- threatening conditions such as obesity, metabolic syndrome and such common chronic systemic diseases as cardiovascular disease, diabetes and osteoporosis. Good nutrition is an important part of leading a healthy lifestyle. Hemoglobin is a human body protein present in erythrocytes. Hemoglobin serves as a transporter of oxygen from the lungs to the tissues and transports carbon dioxide from tissue to lung for excretion. If the amount of hemoglobin decreases from the normal value it can decrease daily activity of human (Hoffbrand *et al.*, 2005). According to WHO, the prevalence of anemia is highest in South Asia, and India has the maximum prevalence of anemia among the South Asian

countries. (Subramaniam *et al.*, 2016). Consumption of hem iron and non-hem iron if done together could increase iron absorption hem (Wang and Pantopoulos, 2011). One of the dietary patterns that often lead to a decrease in hemoglobin levels is the vegetarian diet. A vegetarian diet is a diet pattern that did not consume animal products. Vegetarians could cause the nutritional needs including nutrients that formed hemoglobin was not met adequately which resulting to anemia (Pawlak and Bell, 2017). Thus, keeping in view the association of dietary habits with nutritional status and socio-economic background, this research aimed to determine the relationship between lifestyle and dietary habit with hemoglobin and the prevalence of anemia in farm women of the West Champaran District of Bihar state.

## MATERIALS AND METHODS

Present study was conducted in West Champaran district of Bihar state. A total of 40 farm women were selected randomly to assess their haemoglobin level. Socioeconomic data and eating habits were obtained from interview with farm women. Dietary habit data such as the habit of lifestyle as a vegetarian, the lifestyle of consuming coffee and tea, and also the lifestyle of consuming supplements were

obtained from interviews using interview schedule. The hemoglobin level was measured by clinical laboratory testing of blood samples of the respondents using HiCN Method. Anemia is defined as blood hemoglobin concentration in the blood of the human being. Anemia is defined as blood hemoglobin concentration  $<11.0$  g/dL for children and pregnant women and  $<12.0$  g/dL for non-pregnant women. Severe anemia is defined as blood hemoglobin concentration  $<7.0$  g/dL for children and pregnant women and  $<8.0$  g/dL for non-pregnant women (WHO, 2014). Hemoglobin levels of the participants were correlated with the dietary habits. The type of research used was observational analytics study with cross sectional approach.

## RESULTS AND DISCUSSION

Background information of the respondents in this study was used to provide an overview of the object under study, namely a description of their socio-personal and economic profile, and needs.

The results of the analysis of background information presented in Table 1 revealed that more than one third of the respondents (47.5%) were of young age group (17-35 years), followed by middle (36-55 years) age 37.50 percentage, and only 15.00 percent of respondents belongs to old age (56-75 years). Data pertaining to education of the respondents revealed that 30.00 percent can read and write followed by illiterate (20.0%) and primary level (20.0%). Equal percentages (12.50%) of respondents were educated intermediate and graduate level each and only two respondents were educated matric level. Data regarding family type revealed that more than half of the respondents (52.50%) belong to nuclear family and rest (47.50%) were from joint family. Regarding family size data revealed that half of the respondents (50.0%) were having medium size family structure (5-8 members) followed by large (32.50%) family size (9 and more members). More than half of the respondents having mixed type of dwelling (60.0%) followed by *pucca* house (32.50%) only 7.50 percentage reported they have *katcha* house structure. Data pertaining to family occupation reported in Table 1 revealed that

all the respondents following agriculture occupation only 15.0 percentage respondents reported service followed by business (10.0%) as their family occupation. More than half of the respondents (52.50%) having monthly family income between (Rs.5001 to 10,000/-) followed by (25.0%) income (more than 10001/-) and rest (22.50%) were having their monthly family income upto Rs. 5000/- only. Data regarding grain storage structure majority of the respondents (90.0%) having bamboo and clay

**Table 1: Background information of the female respondents (n=40)**

S. No.	Variable	Frequency	Percentage (%)
1.	Age		
	17-35 years	19	47.50
	36-55 years	15	37.50
	56-75 years	06	15.00
2.	Education		
	Illiterate	8	20.00
	Can read and write	12	30.00
	Primary educated	8	20.00
	Matric	2	5.00
	Intermediate	5	12.50
	Graduate and above	5	12.50
3.	Family type		
	Nuclear	21	52.50
	Joint	19	47.50
4.	Family size		
	Small (Upto 4 members)	7	17.50
	Medium (5 to 8 members)	20	50.00
	Large (9 and more members)	13	32.50
5.	Type of House		
	Katcha	3	7.50
	Pucca	13	32.50
	Mixed	24	60.00
6.	Family Occupation*		
	Agriculture and allied occupation	40	100.00
	Business	4	10.00
	Service	6	15.00
7.	Monthly Family Income		
	Upto Rs.5000/-	9	22.50
	5001 to 10,000/-	21	52.50
	More than 10,001/-	10	25.00
8.	Grain storage structure*		
	Bamboo and clay structure (Beri)	38	90.00
	Cemented structure	4	10.00
	Metaled storage bins	2	5.00
9.	Type of Grains eating habits*		
	Rice/Wheat	40	100.00
	Nutri-cereals/Coarse grains (Ragi, Bajara, Maize)	8	20.00

\*Multiple responses

made grain storage bins followed by cemented grain storage structure (10.0%) and only 2 respondents were having metaled grain storage bins. Grain eating habits of the farm women were reported as wheat and rice, only 20.0 percent of women were also consuming nutri-cereals.

In the Table 2 it can be seen that the hemoglobin level in the respondents of this study much lower i.e., between 8.5 to 11.5 g/dL in more than half of the respondent (55.0%) followed by normal range i.e., 11.6 to 13.5 g/dL (Normal) in 45.0 per cent of the respondents. It could be inferred from the Table 2 that anemia was prevalent in more than half of the respondents (55.0%). Similar finding as reported by Siva *et al.* 2016, that in India, anemia is of major concern in almost (50.0%) of the existing population. The issue at hand gains importance as the percentage of women affects is significantly higher than men, roughly about one out of every two women (56.0%) suffer from some form of anemia.

Data pertaining to dietary habits and lifestyle presented in Table 3, it can be seen that only 10.0 per cent of the respondents were following vegetarian dietary pattern, and while remaining 90.0 per cent have non vegetarian dietary habit. Table 3 further unveiled that majority of the respondents (80.0%) consume tea/coffee on daily basis and only 4 respondents (10.0%) take supplements (multivitamins) prescribed by physician. The habit of consuming tea and coffee with other foods at the

**Table 2: The classification of hemoglobin level of female respondents (n=40)**

Sl. No.	Hemoglobin level	Frequency	Percentage (%)
1.	8.5 to 11.4 g/dL (Low)	22	55.0
2.	11.5 to 13.5 g/dL (Normal)	18	45.0
3.	13.6 to 15.5 g/dL (High)	-	-

same time caused lower iron absorption from the food eaten. The concentration of tannin in tea and coffee were the factors that inhibited the absorption of iron in food.

Result related to hemoglobin concentration in blood of the respondents its association with dietary habit presented in Table 4. It can be inferred that more than half of respondents (52.50%) from non-vegetarian group were having low hemoglobin concentration in their blood and rest of the non-vegetarian group respondents (37.50%) had in normal hemoglobin concentration. From the vegetarian group of respondents equal percentages (5.0%) were in low and normal hemoglobin concentration. This research result is contrast to the research result done by Gorczyca among the vegetarian and non-vegetarian communities in Poland (Gorczyca *et al.*, 2013) and those of Mahajani and Bhatnagar (2015) showed that the average hemoglobin level in non-vegetarian groups were higher the vegetarian groups. The result of the study is also dissimilar to those of (Sari *et al.*, 2018) found that there was a significant difference of

**Table 3: Frequency distributions by Lifestyle and dietary habit (n=40)**

Sl. No.	Consumptions*	Frequency of consumption in a month	Frequency	Percentage (%)
1.	Vegetarian Diet	3 times a day	4	10.00
2.	Non-Vegetarian diet	4 days in a month	36	90.00
3.	Tea/Coffee	daily 2 times	32	80.00
4.	Supplements (multivitamins etc.)	weekly	4	10.00

\*Multiple responses

**Table 4: The relationship of between vegetarian diets and hemoglobin level** n=40

Sl No.	Hemoglobin level	Vegetarian		Non- Vegetarian	
		Frequency	Percentage	Frequency	Percentage
1.	8.5 to 11.4 g/dL(Low)	2	5.00	21	52.50
2.	11.5 to 13.5 g/dL (Normal)	2	5.00	15	37.50
	Total	4		36	

hemoglobin level in the vegetarian group compared to non-vegetarian group. The reason may be socio-economic background of the respondents and the availability and quality of foods.

## CONCLUSION

The hemoglobin level was measured by clinical laboratory testing of blood samples of the respondents. Nearly half of the respondents were young age group (47.50%, can read and write (30.0%), having nuclear family (52.50%), medium size family (50.0%), mixed type of house (60.0%), agriculture as main family occupation (100.0%), monthly family income range between Rs.5001-10000/-(52.50%), bamboo and clay made structure for grain storage (90.0%). and rice/wheat consumption pattern (100.00%). More than half of the respondents (57.50%) having low hemoglobin concentration and having non-vegetarian food habit (90.0%) and more than half of respondents (52.50%) of non- vegetarian were having low hemoglobin concentration. This research found that there is a no positive correlation of hemoglobin level in the vegetarian group compared to non-vegetarian group.

**Consent:** Informed consent was obtained from all the respondents

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