

# What are people eating in Nalanda, India?

*Food consumption, food  
security, food sources, and food  
perceptions*

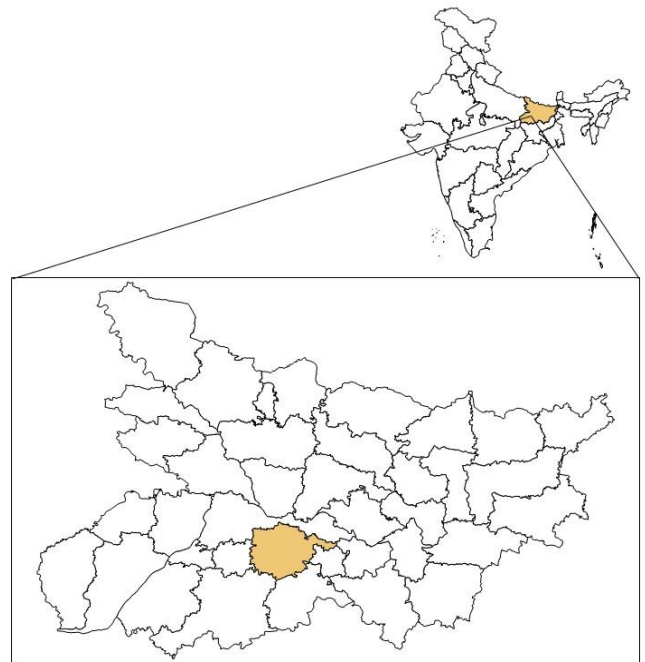
Data Note 5

December 2023

## ABOUT THIS DATA NOTE |

The Transforming Agrifood Systems in South Asia (TAFSSA) district agrifood systems assessment aims to provide a reliable, accessible, and integrated evidence base that links farm production, market access, dietary patterns, climate risk responses, and natural resource management with gender as a cross-cutting issue in rural areas of Bangladesh, India, and Nepal. It is designed to be a district-level multi-year assessment. Using data collected in March-April 2023, this data note describes what people are eating, where they get their food, household food insecurity, and perceptions about food. This is one of a set of data notes that, together, provide a holistic picture of the agrifood system in the district.

**Figure 1. District location in India**



**Figure 2. Highlights from this data note**



**12% & 14%**

Adult men and  
women with  
diverse diets



**14%**

Adult men who  
consumed fruit  
on previous day



**66%**

Of households  
purchased  
rather than  
produced foods



**3.6 & 3.5**

Number of  
times per day  
adult men &  
women ate  
food



**54%**

Adolescents  
consumed  
biscuits or  
sweets multiple  
times a week

## OVERVIEW OF CONTENTS

TAFSSA's district agrifood systems assessment aimed to interview three respondents per household: a female adult (aged 20+ years), a male adult (aged 20+ years), and an adolescent (aged 10-19 years). Information on the household and respondent sampling strategy is provided at the end of this data note.

In this data note, you will first find information on background characteristics of the households and individuals who were interviewed. This is followed by information on *what* people are eating, which was captured using several measurement methods. Respondents were asked about the foods they ate the day before the interview (24-hour recall) and about how often they ate certain foods in the past week (food frequency questionnaire). The 24-hour recall was conducted using the Global Diet Quality Score (GDQS) application, which also captured when (at what eating occasion such as breakfast, a snack between lunch and dinner, etc.) people ate each food item.

In addition to what people eat, you will find information in this data note on *where* they get their food and, if they buy it, what types of markets or shops they buy it from.

Finally, you will learn *why* people choose to eat certain healthy and unhealthy foods. Respondents were asked about availability, accessibility, taste, and other factors that may influence their decisions to consume certain foods. More details about the measurement methods are found on the following pages.

### List of figures and tables

Figure 1. District location in India

Figure 2. Highlights from this data note

Table 1. Household and individual characteristics

Figure 3A. Level of household food insecurity

Figure 3B. Individual FIES items

Figure 4A. Minimum dietary diversity

Figure 4B. Global diet quality positive (healthy) and negative (unhealthy) scores

Figure 4C. Diet related NCD risk

Figure 5. Consumption of food groups on previous day

Figure 6. Consumption quantity by GDQS food group

Figure 7. Most commonly consumed foods in each food group

Figure 8. Number of eating occasions per day

Figure 9. Who eats at different eating occasions

Figure 10. Frequency of consumption of sentinel foods in previous 7 days

Figure 11. Food sources

Figure 12. Where food is purchased

Figure 13. Food perceptions (% who agree with each statement)

**Table 1. Household and individual characteristics**

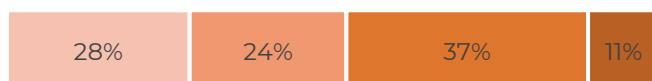
Household characteristics		Individual characteristics			
Number	1000		Adult female	Adult male	Adolescent
Female-headed, %	27	Number	1033	652	998
Education of head, years	5	Age, yrs. mean (range)	39 (20-75)	47 (21-82)	15 (10-19)
Average household size, members	6	Education, yrs. mean (range)	3 (0-17.5)	6 (0-17.5)	7 (0-17.5)
Involved in agriculture, %	82	Married, %	93	96	4
Has improved toilet, %	41	Employed, %	41	97	5
Drinking water source		Primary occupation			
Piped into dwelling, %	39	Unpaid household work, %	59	0	7
Tube well or borehole, %	36	Farming, %	20	55	1
Main source of income		Casual non-farm labour (paid), %	1	21	2
Crop cultivation, %	39	Student, %	0	0	87
Business, %	31				
Wages, %	12				
Type of fuel used for cooking					
Dung cake, %	87				
LPG/natural gas, %	77				
Wood, %	60				

**Measuring household food insecurity**

Household food insecurity was measured using the Food and Agriculture Organization's Food Insecurity Experience Scale (FIES). Respondents were asked 8 questions about their household's experiences with food in the past 30 days. Categories of food security (none, mild, moderate, severe) were generated based on the number of questions with a positive response.

**Fig 3A. Level of household food insecurity**

■ None (0) ■ Mild (1-2) ■ Moderate (3-5) ■ Severe (5-8)

**Fig 3B. Individual FIES items****FINDINGS**

- ✓ Approximately half of the households reported experiencing moderate or severe food insecurity.

## MEASURING WHAT PEOPLE EAT

Diets were measured by asking people about everything they ate or drank on the previous day, from the time they woke up until the time they went to bed and didn't eat or drink anything more. This includes all snacks and foods and drinks consumed at home and outside the home.

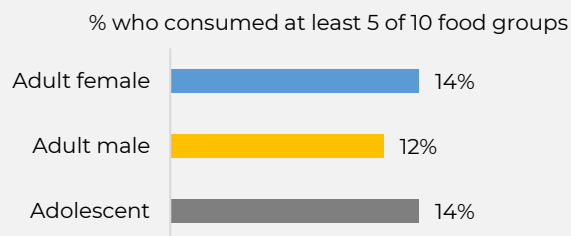
To capture this information, we used the Global Diet Quality Score (GDQS) application (Bromage et al. 2021). The GDQS allows us to understand diet quality, which is associated with the risk of disease. We report the percentage of individuals with at least minimum dietary diversity (FAO and FHI 360, 2016) (**Figure 4A**), that is those who consume at least 5 of the following 10 food groups daily: 1) grains, white roots and tubers, and plantains, 2) pulses (beans, peas, and lentils), 3) nuts and seeds, 4) dairy, 5) meat, poultry, and fish, 6) eggs, 7) dark green leafy vegetables, 8) other vitamin A-rich fruits and vegetables, 9) other vegetables, and 10) other fruits.

We also computed metrics that indicate how healthy or unhealthy diets are (**Figure 4B**). Higher GDQS- and GDQS+ scores indicate better diet quality. We then grouped GDQS scores into 3 categories to indicate diet related noncommunicable disease (NCD) risk (**Figure 4C**).

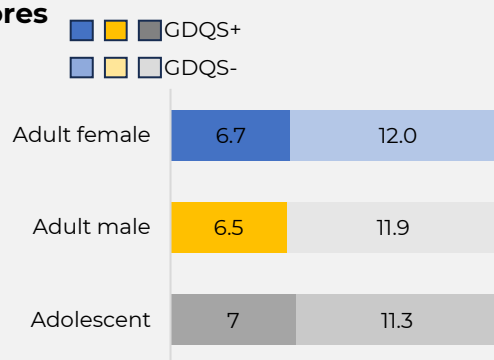
On the following pages, we show the percentage of individuals who consume various food groups (**Figure 5**), the consumption quantity by food group (**Figure 6**), the most commonly consumed foods (**Figure 7**), how many times per day people eat (**Figure 8**), who eats at various eating occasions (**Figure 9**).

### Diet quality scores

**Fig 4A. Minimum dietary diversity**

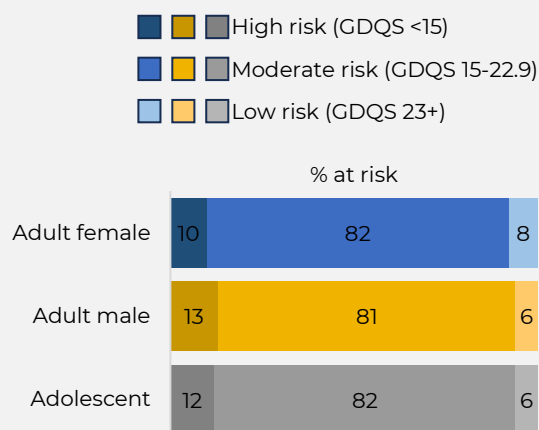


**Fig 4B. Global diet quality positive (healthy) and negative (unhealthy) scores**



Note: The GDQS+ and GDQS- can be summed to give the total GDQS score, with a higher total GDQS score indicating better diet quality.

**Fig 4C. Diet related NCD risk**



## FINDINGS

- ✓ Diet quality was poor, with low dietary diversity for most respondents
- ✓ Diet-related noncommunicable disease risk was moderate or high for over 90% of respondents.

**Figure 5. Consumption of food groups on previous day****FINDINGS**

- ✓ Consumption of fruits and dark green leafy vegetables was <15% for all respondent types.
- ✓ Around 45% of individuals consumed some animal-source foods on the previous day.
- ✓ Adolescents were the most likely to consume sweets & ice-cream and refined grains/baked goods.

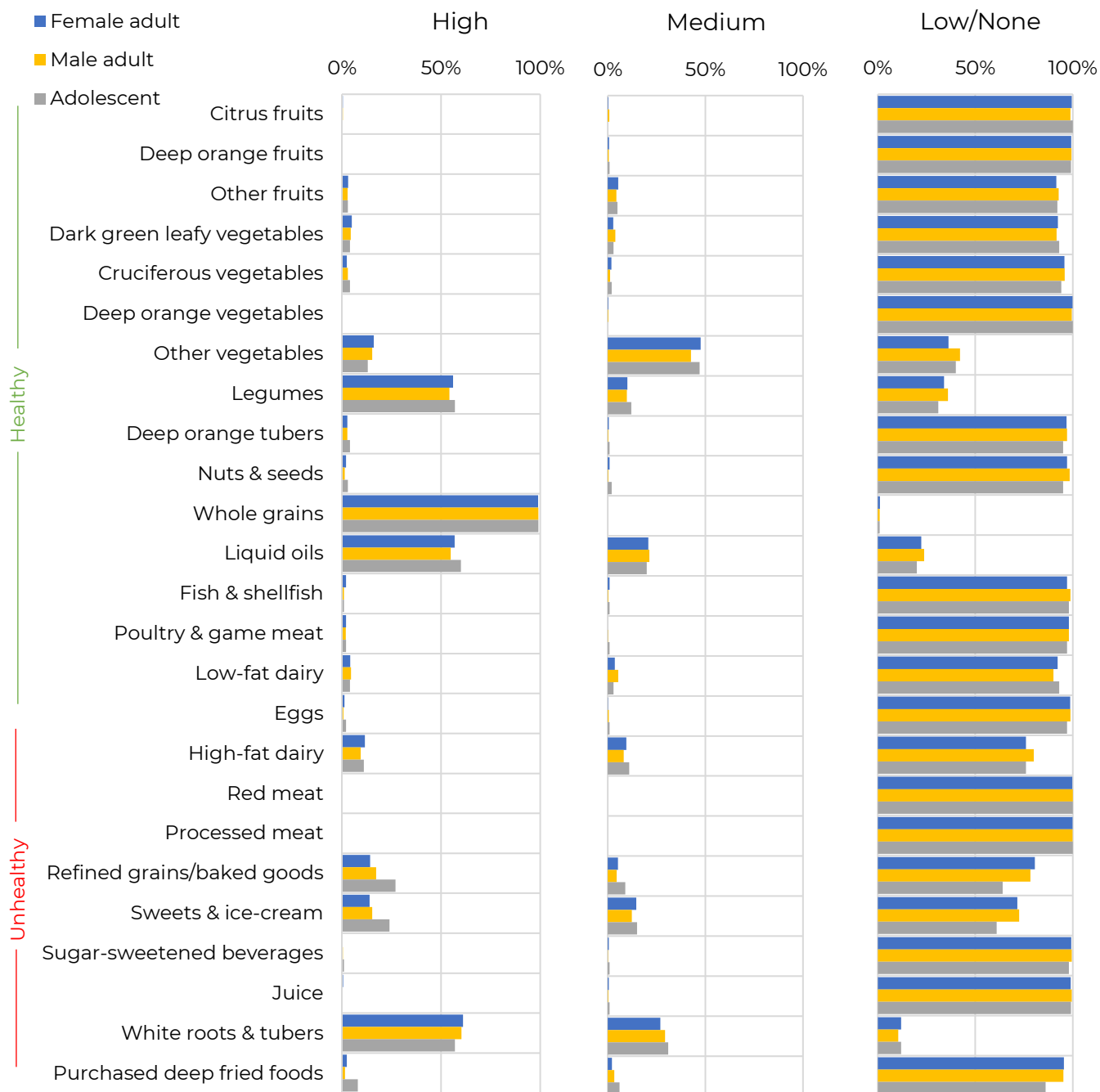
Note: High-fat dairy and red meat are considered unhealthy when consumed in high quantities.



A woman wearing a red and black patterned sari is crouching on the ground, peeling a hard-boiled egg. She is looking down at her hands. In front of her is a large, shallow metal bowl filled with many hard-boiled eggs. The background is a plain, light-colored wall.

## ***Animal-source foods***

Only around 1% of adult women and adult men consumed eggs on the day before the survey

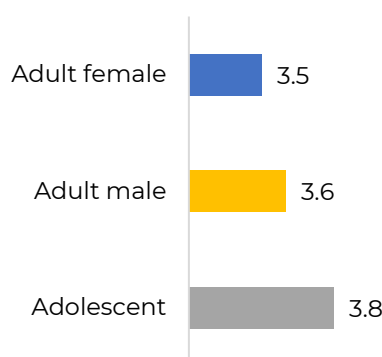
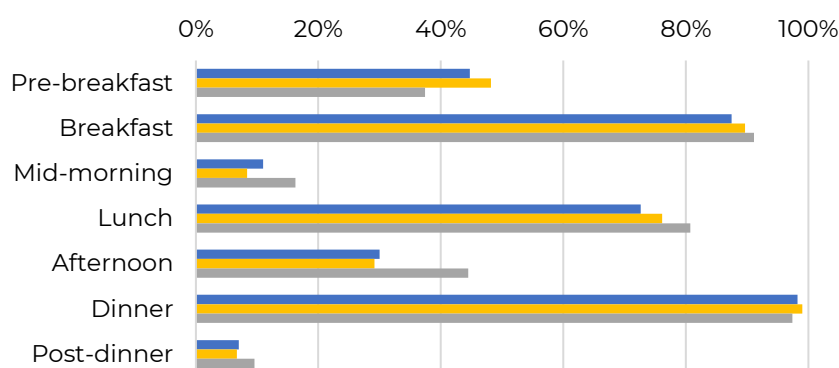
**Figure 6. Consumption quantity<sup>1</sup> by GDQS food group****FINDINGS**

- ✓ The quantity of fruits, nutrient-rich vegetables, and animal source foods was very low.
- ✓ To reduce the risk of developing noncommunicable diseases, consumption of healthy foods such as fruits and nutrient-rich vegetables should increase and consumption of unhealthy foods such as refined grains/baked goods, sweets & ice-cream, and white roots & tubers should decrease.

<sup>1</sup> “Low”, “medium”, and “high” describe consumption levels that predict noncommunicable disease risk in studies from Africa, Asia, and the Americas (Bromage et al. 2021). Disease risk is minimized when healthy foods are consumed in “high” quantities and unhealthy foods are consumed in “low” quantities.

**Figure 7. Most commonly consumed foods in each food group (adult male, adult female, and adolescent combined)**

		Top 3 foods consumed in each food group			
		% who consumed food group	1 <sup>st</sup> most common	2 <sup>nd</sup> most common	3 <sup>rd</sup> most common
Healthy	Citrus fruits	3	N/A <sup>1</sup>	N/A <sup>1</sup>	N/A <sup>1</sup>
	Deep orange fruits	1	Papaya	N/A <sup>1</sup>	N/A <sup>1</sup>
	Other fruits	11	Grapes	Jackfruit	Banana
	Dark green leafy vegetables	12	Coriander leaves	Saag	Chaya leaves
	Cruciferous vegetables	5	Cabbage	Cauliflower	Brussel sprouts
	Deep orange vegetables	0	N/A <sup>1</sup>	N/A <sup>1</sup>	N/A <sup>1</sup>
	Other vegetables	77	Onion	Tomato	Brinjal
	Legumes	68	Masoor dal	Moong dal	Chana dal
	Deep orange tubers	4	Potatoes (OSFP <sup>2</sup> )	N/A <sup>1</sup>	N/A <sup>1</sup>
	Nuts & seeds	6	Peanuts	N/A <sup>1</sup>	N/A <sup>1</sup>
	Whole grains	99	Rice	Roti	Puri
	Fish & shellfish	2	Rohu	N/A <sup>1</sup>	N/A <sup>1</sup>
	Poultry & game meat	3	Chicken	N/A <sup>1</sup>	N/A <sup>1</sup>
	Low fat dairy	12	Milk	Cow milk	N/A <sup>1</sup>
	Eggs	2	N/A <sup>1</sup>	N/A <sup>1</sup>	N/A <sup>1</sup>
	High fat dairy	30	Milk	Buffalo milk	Yogurt
Unhealthy	Red meat	0	N/A <sup>1</sup>	N/A <sup>1</sup>	N/A <sup>1</sup>
	Processed meat	0	N/A <sup>1</sup>	N/A <sup>1</sup>	N/A <sup>1</sup>
	Refined grains/baked goods	27	Puffed rice	Maida	Rice
	Sweets & ice-cream	51	Sugar	Biscuit	Cookie
	Sugar-sweetened beverages	2	N/A <sup>1</sup>	N/A <sup>1</sup>	N/A <sup>1</sup>
	Juice	2	N/A <sup>1</sup>	N/A <sup>1</sup>	N/A <sup>1</sup>
	White roots and tubers	92	Potatoes	Aloo bharta	Rasedaar aloo
	Purchased deep fried foods	9	Maida	Potatoes	N/A <sup>1</sup>
	Deep fried foods at home	10	Puri	N/A <sup>1</sup>	N/A <sup>1</sup>

**Figure 8. Number of eating occasions per day (mean)****Figure 9. Who eats at different eating occasions**

## FINDINGS

- ✓ Adult women ate slightly fewer times per day than adult men or adolescents.
- ✓ Respondents often eat between the main meals; 45% of adolescents ate food between lunch and dinner.

<sup>1</sup>Not applicable (N/A): Foods consumed by less than 2% of the respondents have not been displayed.

<sup>2</sup>OFSP refers to orange fleshed sweet potato.

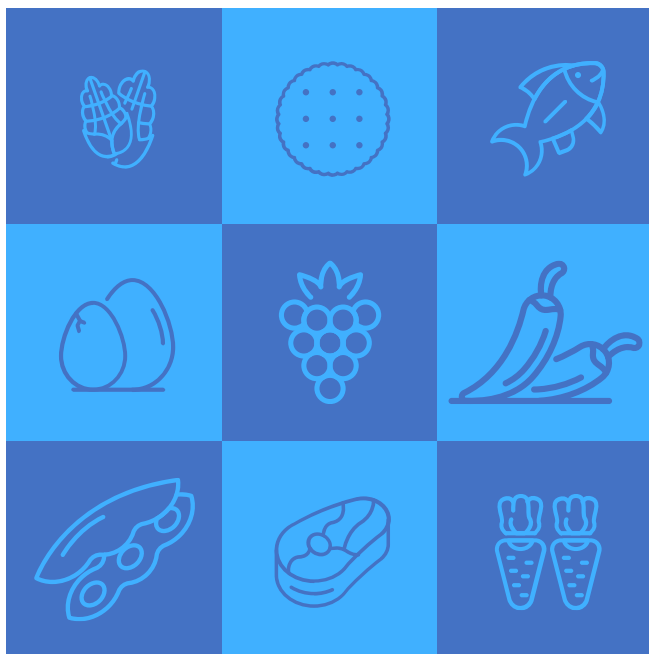


**SENTINEL FOODS |** In addition to the GDQS, which provided information about all foods consumed in the previous 24 hours, we selected a set of 25 “sentinel foods” to better understand how frequently these foods are consumed, food sources, where people buy food, and their perceptions about food.

Respondents were asked how frequently they consumed these foods in the past 7 days (**Figure 10**). They were also asked about where their household gets each food (purchased from outside, own production, received from others, received from government, gather/forage) (**Figure 11**). If they said their household purchases the food, we asked them where it is purchased (haat, retail shop, farm, government ration shop, or other market type) (**Figure 12**).

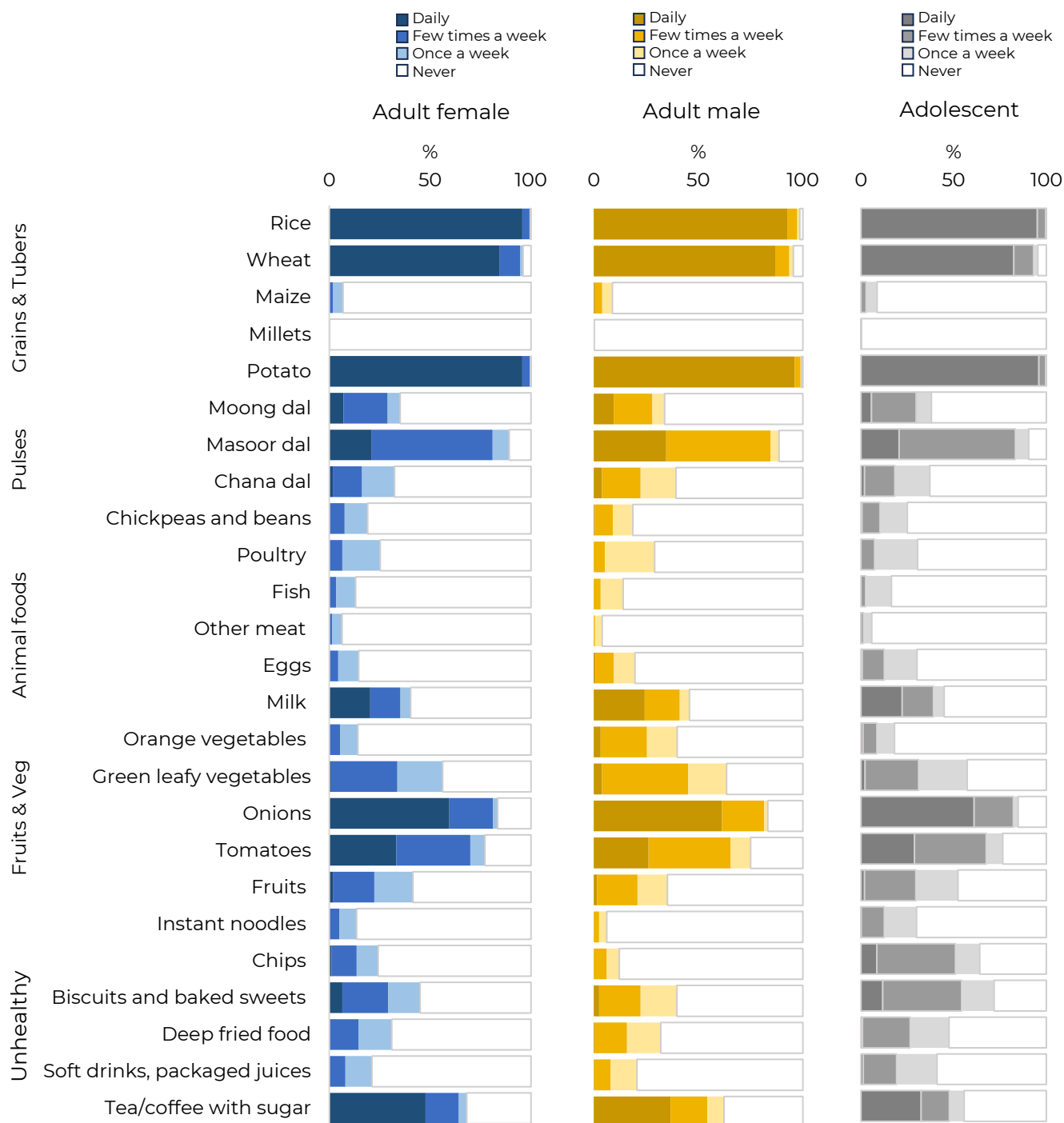
For a few foods, we dug deeper to understand people’s food perceptions, or what they think about the foods. This included whether they know of a vendor who sells the food, if the food is safe to eat, easy to acquire near where they spend most of their time, is not too expensive, is fast and easy to prepare, tastes good, fills their stomach, is nutritious, and if their family enjoys eating it (**Figure 13**).

Understanding these perceptions provides insights into drivers or barriers of consumption of healthy and unhealthy foods.

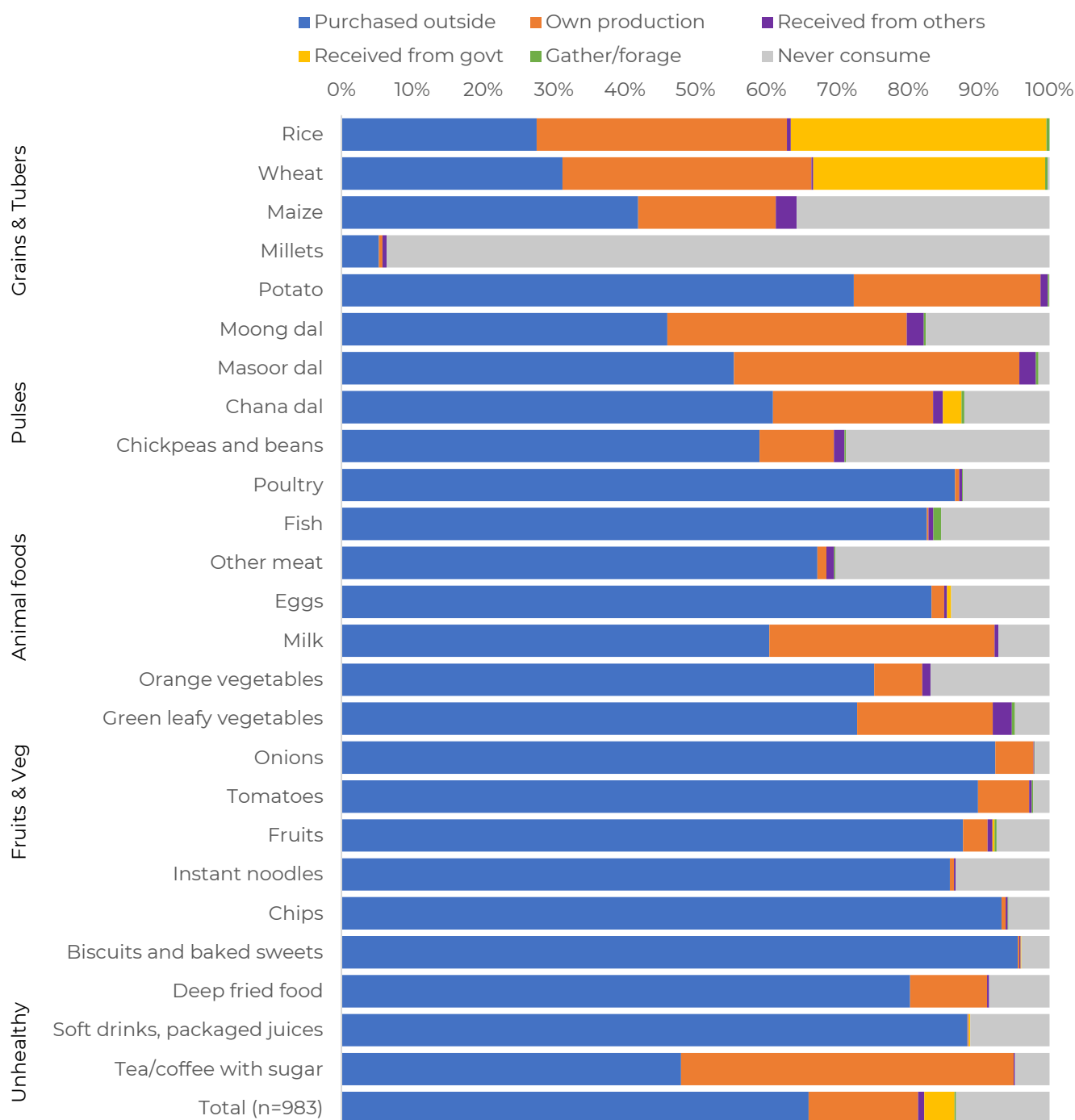


### Sentinel food list

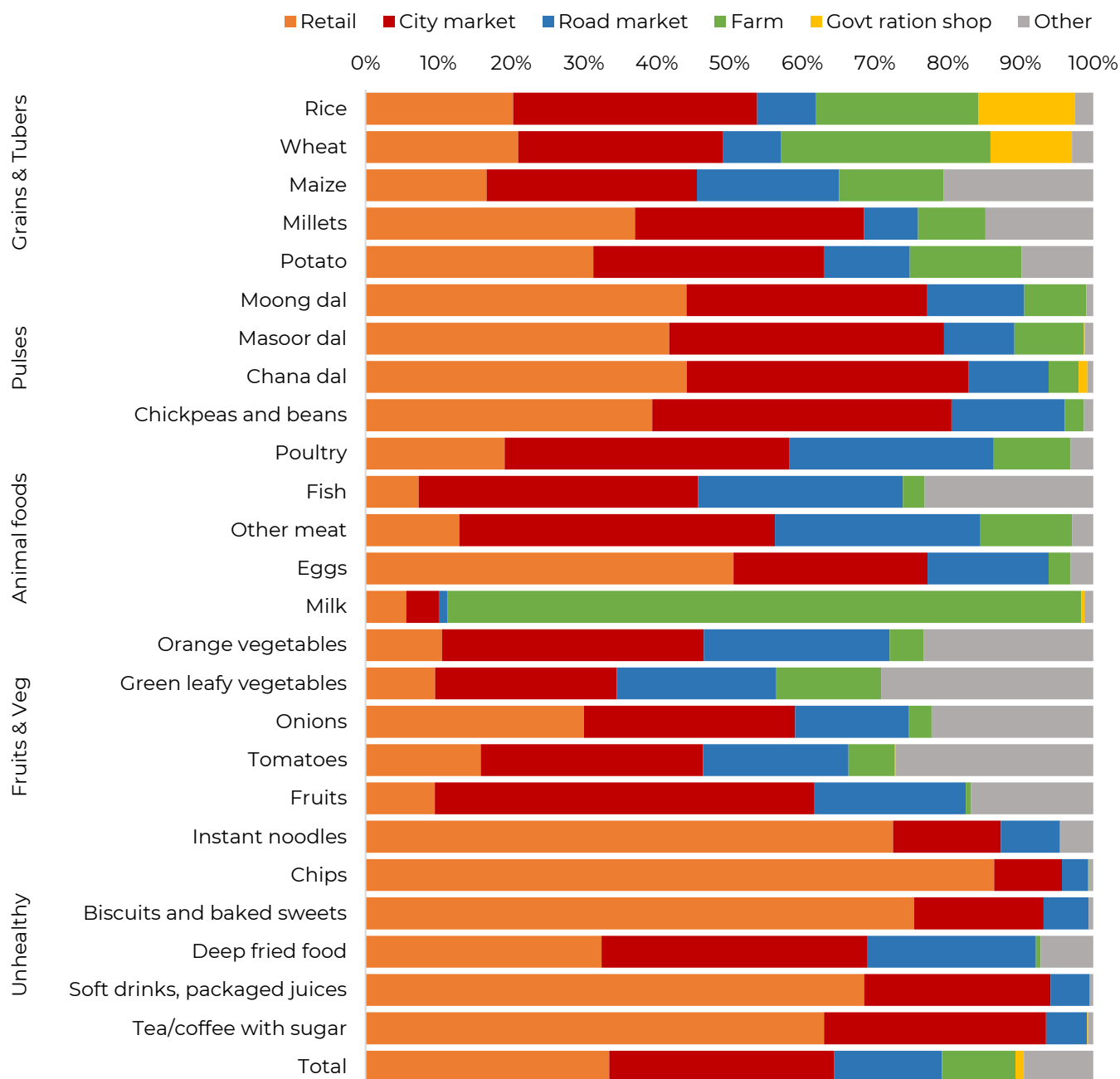
1. Rice
2. Wheat
3. Maize
4. Millets
5. Moong dal
6. Masoor dal
7. Chana dal
8. Chickpeas and beans
9. Potato
10. Poultry (chicken, ducks, pigeons, etc.)
11. Fish
12. Other meat (e.g., mutton)
13. Eggs
14. Milk (e.g., cow, buffalo, goat)
15. Orange vegetables (e.g., pumpkin, carrots)
16. Green leafy veg. (e.g., spinach, mustard, taro, pumpkin leaves, red amaranth leaves)
17. Onions
18. Tomatoes
19. Fruits (e.g., guava, banana, apple, mango)
20. Instant noodles (e.g., Maggi, Wai Wai)
21. Chips (e.g., Lays, Kurkure)
22. Biscuits and baked sweets (e.g., cakes and cookies, mithai)
23. Deep fried food (e.g., samosa, pakora)
24. Soda/soft drinks and packaged juices (e.g., Coke, Sprite, Fanta, Maaza)
25. Tea/coffee with sugar

**Figure 10. Frequency of consumption of sentinel foods in previous 7 days****FINDINGS**

- ✓ Rice, wheat, potatoes, and dal were consumed daily by nearly all respondents.
- ✓ Consumption of unhealthy food was highest among adolescents.
- ✓ Tea/coffee with sugar was consumed daily by around half of adult females and one-third of adult males and adolescents.

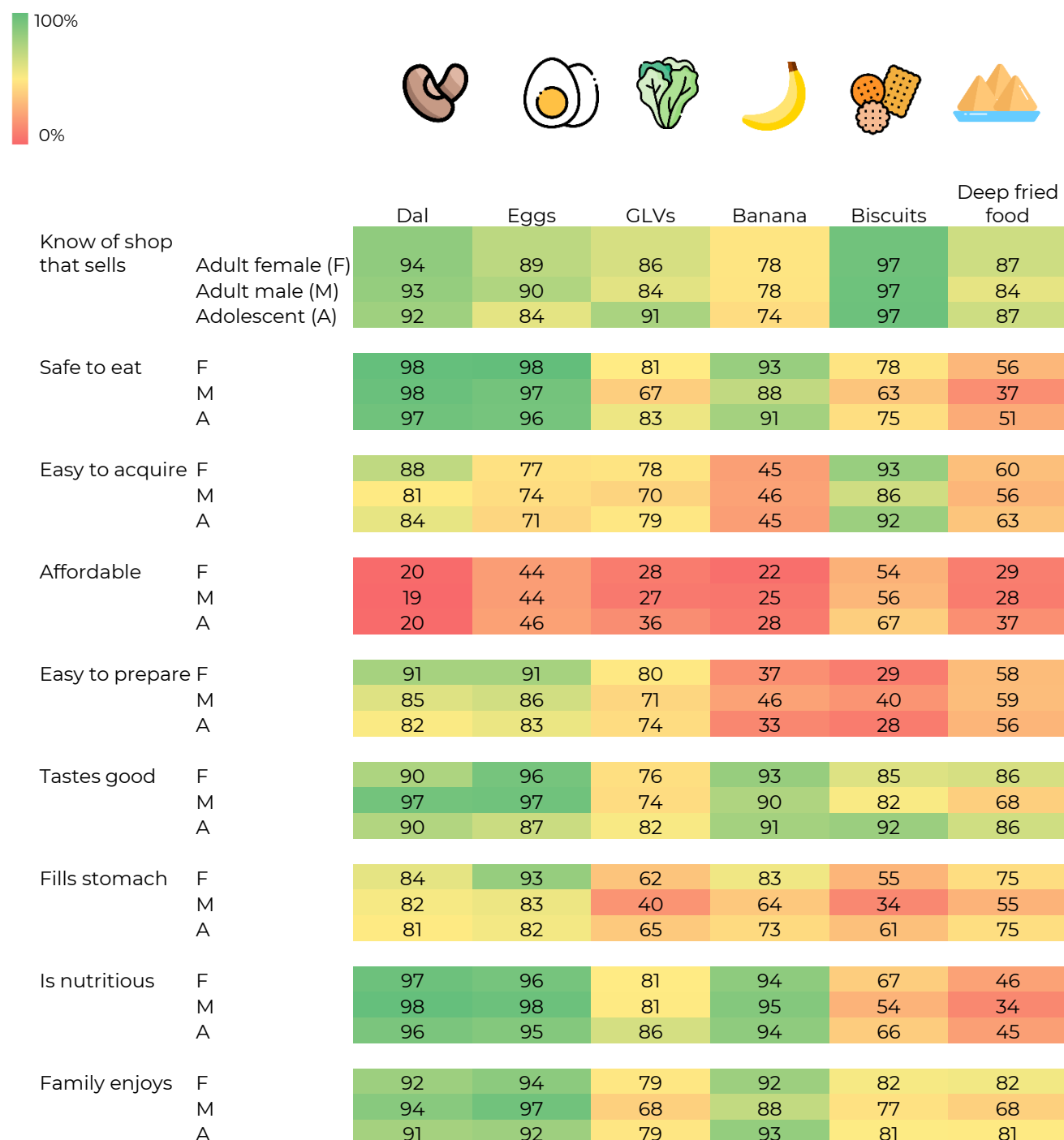
**Figure 11. Food sources****FINDINGS**

- ✓ Most households purchased their food rather than producing it themselves.
- ✓ About one-third households consumed rice and wheat that was purchased from outside, about one-third households consumed rice and wheat from their own production, and about one-third households received rice and wheat from the government.
- ✓ Gathering/foraging food was not a common food source.

**Figure 12. Where food is purchased****FINDINGS**

- ✓ Food was predominantly purchased from retail and city market.
- ✓ Milk was often purchased directly from the farmer/producer rather than through a market.
- ✓ Unhealthy foods were purchased mainly from retail shops and city market.

Note: Data shown are for the subset of households who purchase the food from outside (Figure 11). "Others" includes haats, weekly markets, wholesale markets, mobile vendors, and any other purchase source. Haats are wholesale markets where foods are sold in bulk directly by manufacturers/ farmers/ artisans at a fair price, in permanent or semi-permanent infrastructure. Retail shops means fixed or mobile individual shops where foods are sold directly to the consumers, including local grocery stores, specialized shops, vegetable/fruit shops, restaurants, and tea stalls.

**Figure 13. Food perceptions (% who agree with each statement)****FINDINGS**

- ✓ Most respondents knew of a shop that sells the different foods, with the highest knowledge of shops that sell biscuits.
- ✓ Perceived affordability of most foods was low. Biscuits were the most affordable.
- ✓ Around half or less than half of respondents considered deep fried food safe to eat or nutritious.

Note: GLVs = green leafy vegetables.

## KEY TAKEAWAYS

1. There is room for improvement in diet quality.
  - Consumption of healthy food groups such as nuts & seeds, high quality proteins, fruits, green leafy vegetables, and deep orange vegetables is low.
  - Consumption of starchy foods with low nutrient density (rice, potatoes) is high..
  - Consumption of unhealthy food groups such as biscuits, sweets, and sugary tea/coffee is high.
  - Many individuals are at high risk of diet-related noncommunicable diseases given their reported diets.
2. Most households purchase food from markets rather than producing it themselves, with retail shops being the most common source of food purchase.

## KEY QUESTIONS FOR ACTION

1. What are the key barriers to improving diet quality in the district?
2. What are a few potential solutions to overcome these barriers? What is needed from decision-makers and from program teams to implement these solutions?
3. How can understanding eating patterns throughout the day and perceptions about healthy and unhealthy foods help inform strategies to influence consumption of these foods?
4. What additional information is needed to facilitate actions to improve diets in the district?





## SURVEY METHODOLOGY

### Village and household sampling

We selected 25 villages in the district with a probability proportional to the number of households that reside in each village. Within each village, we conducted a household listing to identify eligible households, that is, those with adolescents (10-19 years old). From the households with adolescents, we randomly invited 20 households to participate in the survey. If a household refused, we replaced that household with another randomly selected eligible household, to retain a total of 1,000 households in the district. Thus, the findings reported in this data note are representative of rural households from this district that include an adolescent.

### Respondent selection

Within households, one adult female aged 20+ years, one adult male aged 20+ years, and one adolescent aged 10-19 years were selected as the respondents for the survey. When multiple adolescents were living in a household, the oldest adolescent was selected. In some households, an adult male was not available (often due to migration for work). In such households, the female was the only adult respondent (see Table 1 for respondent sample sizes). At the beginning of the interview, the adult in the household primarily involved in agriculture (either male or female) and the adult primarily responsible for food purchasing (either male or female) were identified as the primary respondents.

## INDICATOR DEFINITIONS

Indicator	Definition
GDQS+	The Global Diet Quality Score positive sub-metric is composed of the summed score of the 16 healthy food groups and ranges from 0-32 points, with a higher score indicating higher diet quality.
GDQS-	The Global Diet Quality Score negative sub-metric is composed of the summed score of the 7 unhealthy food groups and the 2 food groups that are unhealthy when consumed in excess amounts (high-fat dairy and red meat), with a higher score indicating lower diet quality. The GDQS negative score has a possible range of 0-17.

## REFERENCES

Bromage, S., C. Batis, S.N. Bhupathiraju, et al. 2021. "Development and Validation of a Novel Food-Based Global Diet Quality Score (GDQS)." *Journal of Nutrition* 151,(10S), Supp. 2.

FAO and FHI 360. 2016. *Minimum Dietary Diversity for Women: A Guide for Measurement*. Rome: FAO.

## AUTHORS

**Samuel Scott**, Research Fellow, IFPRI  
**Sharvari Patwardhan**, Research Analyst, IFPRI  
**Suman Chakrabarti**, Associate Research Fellow, IFPRI  
**Alka Chauhan**, Research Analyst, IFPRI  
**Archis Banerjee**, Research Analyst, IFPRI  
**Sumanta Neupane**, Program Manager, IFPRI  
**Aklima Parvin**, Program Manager, IFPRI  
**Sabrina Rasheed**, Scientist, icddr,b  
**Kaosar Afsana**, Professor, James P Grant School of Public Health, BRAC University  
**Nazma Shaheen**, Professor, University of Dhaka  
**Christine Blake**, Associate Professor, University of South Carolina  
**Purnima Menon**, Senior Director for Food and Nutrition Policy, CGIAR & IFPRI  
**Avinash Kishore**, Senior Research Fellow, IFPRI

## REFERENCES

Bromage, S., C. Batis, S.N. Bhupathiraju, et al. 2021. "Development and Validation of a Novel Food-Based Global Diet Quality Score (GDQS)." *Journal of Nutrition* 151,(10S), Supp. 2.

FAO and FHI 360. 2016. *Minimum Dietary Diversity for Women: A Guide for Measurement*. Rome: FAO.

## SUGGESTED CITATION

Scott S, Patwardhan S, Chakrabarti S, Chauhan A, Banerjee A, Neupane S, Parvin A, Rasheed S, Afsana K, Shaheen N, Blake C, Menon P, Kishore A. 2023. What are people eating in Nalanda, India? TAFSSA Data Note 5. New Delhi, India: Transforming Agrifood Systems in South Asia (TAFSSA).

## FUNDING ACKNOWLEDGEMENT

We would like to thank all funders who supported this research through their contributions to the CGIAR Trust Fund:  
<https://www.cgiar.org/funders/>

To learn more, contact: [a.kishore@cgiar.org](mailto:a.kishore@cgiar.org)

To learn more about TAFSSA, contact: [t.krupnik@cgiar.org](mailto:t.krupnik@cgiar.org);  
[p.menon@cgiar.org](mailto:p.menon@cgiar.org)

## ABOUT TAFSSA

TAFSSA (Transforming Agrifood Systems in South Asia) is a CGIAR Regional Integrated Initiative that supports actions improving equitable access to sustainable healthy diets, that boosts farmers' livelihoods and resilience, and that conserves land, air, and water resources in a climate crisis.

## ABOUT CGIAR

CGIAR is a global research partnership for a food secure future. Visit <https://www.cgiar.org/research/cgiar-portfolio> to learn more about the initiatives in the CGIAR research portfolio.

## DISCLAIMER

This publication has been prepared by the TAFSSA Initiative and has not been peer reviewed. Any opinions stated herein are those of the author(s) and do not necessarily reflect the policies or opinions of initiatives, donor agencies, or partners.

© 2023 CGIAR System Organization.

This publication is licensed for use under a Creative Commons Attribution 4.0 International License (CC BY 4.0).