OBESITY EXPERTISE

A first-principles curriculum in 196 books

BOOK 4 5th of 196 in the series

Food systems, value chains and Indian food policy · Rung 1

Where food comes from, who decides, and what the state itself serves

FROM FIELD TO PLATE, AND THE POLICIES THAT BUILT INDIA'S PLATE

Dr. Harsh Maheshwari

MD Community Medicine Resident, AIIMS Raipur

drharshmaheshwari.com · version 1.0

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Dr. Harsh Maheshwari

MD Community Medicine Resident, AIIMS Raipur

contact@drharshmaheshwari.com · drharshmaheshwari.com · ORCID 0000-0001-8848-1918

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CONTACT	contact@drharshmaheshwari.com
ORCID	https://orcid.org/0000-0001-8848-1918
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NOT ADVICE

This book is for learning. It is not medical, legal or financial advice, and it does not replace a qualified professional who knows your situation.

About the author



Dr. Harsh Maheshwari

MD Community Medicine Resident, AIIMS Raipur

Harsh Maheshwari completed his MBBS at King George's Medical University (KGMU), Lucknow, and is a resident in MD Community Medicine at the All India Institute of Medical Sciences (AIIMS), Raipur. His MD thesis, on chrononutrition and obesity, was selected by the Indian Council of Medical Research (ICMR) for funding in 2026.

He learns best from first principles: rebuilding an idea from what came before it until the formula feels like the only reasonable answer. This series grew out of that habit.

His long-term aims are to reduce obesity in India and to help make India healthy.

Email	contact@drharshmaheshwari.com
Website	drharshmaheshwari.com
ORCID	0000-0001-8848-1918

Introduction

Why this book exists

Most proposals to reduce obesity speak to the person holding the plate: eat less, choose better. But what is on the plate was decided long before, by people who grew, stored, processed, moved, priced and sold it, and by governments that shaped each of those steps. In India the state is also one of the largest cooks and grocers in the country, through rations, school meals and anganwadi food. This book maps that system, so that any intervention can be placed where it actually acts.

How to read it

Read Book 0 first, or at least the sections this book names as it goes. Then read this one in order: each section assumes everything before it. Keep one packaged food you eat often in mind from the first page; by the end you will sketch its supply chain yourself.

Every section has the same shape. **Definition** states the idea exactly. **In plain terms** says it again in everyday words. **Illustration** works through one real case, usually with a source you can open yourself. **Where this picture breaks** says where the illustration stops being true. **Must-know points** are what should change what you do. Then come **exercises** and, in most sections, a graded **practice set**.

Do the exercises before you look anything up. The worked answers are in the appendix at the back, under the same numbers. The references for each Part follow that Part. The glossary lists every term of art in the plain words it was first given. The last pages list all 196 books in the series and show where this one sits.

If you are new to this

On a first reading, read each section's definition, plain-terms explanation, illustration and must-know points, and do the exercises. Worked derivations can be skimmed and revisited once the idea feels familiar. Keep a calculator beside you: every worked answer can be followed with pen, paper and a calculator. Anything beyond the stated prerequisites is explained where it first appears, or marked as beyond this book. The **Symbols used in this book** page lists every sign and Greek letter with how to read it and where it is first used.

How to send feedback

If something is wrong, unclear, or could be better, please write to **contact@drharshmaheshwari.com**. Put the book number, the version and the section in the subject line (for example: *Book 4, v1.0, section C5*). Say what the text says, what you think it should say, and, if you can, the source.

Corrections are made in new versions. The version number and the date of the last update are on the copyright page of every book, and the newest version of every book is at **drharshmaheshwari.com**.

WHERE THIS BOOK SITS

Book 4 of the series' 196 books (Book 0 and 195 rung books). Before it: Book 3, Qualitative and mixed methods · Rung 1. After it: Book 5, Policy process, framing and advocacy craft · Rung 1. The full list is at the back.

Symbols used in this book

Every sign and Greek letter this book prints, how to read it aloud, what it means in this series, and the section where it first appears. Each is also explained where it is first used.

Symbol	Read as	Meaning	First in
SIGNS			
÷	divided by	Division	4 · Where the consumer's rupee goes: the price build-up
×	times	Multiplication	4 · Where the consumer's rupee goes: the price build-up
±	plus or minus	A range either side of a value: 11.8 ± 0.6 means 11.2 to 12.4	13 · What a ration, a meal or a take-home ration provides
MARKS ON LETTERS			
x^2, 10^{-3}	superscript	Small raised characters are powers: x^2 = x × x, and 10^{-3} = 0.001	Before you start

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Before you start

This book uses the following Book 0 sections. Each is summarised where it is first needed; work through Book 0 itself if a summary is not enough.

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- Book 0, B4 · Energy units: joule, kilojoule, calorie, kilocalorie
- Book 0, B5 · Concentration units: mg/dL, mmol/L, and converting between them
- Book 0, B6 · Body-size units: kg, m, cm and kg/m^2
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- Book 0, E2 · Chemical energy, combustion, and the bomb calorimeter
- Book 0, E3 · Conservation of energy, and a system with a boundary
- Book 0, F1 · Reading a table
- Book 0, F2 · Reading a figure, and the ways a figure misleads
- Book 0, F3 · Checking a reference
- Book 0, F4 · Argument: premise, inference, conclusion
- Book 0, F5 · How government works, in the shape you need to read a regulation

Rung 1 — Introductory

1 · What a food system is

Checked against the sources as they stood on 2026-09-25.

DEFINITION. The High Level Panel of Experts on Food Security and Nutrition (HLPE) of the Committee on World Food Security adopted a definition of a food system in 2014. A food system "gathers all the elements (environment, people, inputs, processes, infrastructures, institutions, etc.) and activities that relate to the production, processing, distribution, preparation and consumption of food, and the output of these activities, including socio-economic and environmental outcomes".

Inside the system, HLPE names the food supply chain: the activities and actors that take food from production to consumption and to the disposal of its waste. It lists the chain's steps as production; storage and distribution; processing and packaging; and retail and markets.

This book reads the system as eight stages: production, storage, processing, distribution, retail, preparation, consumption and waste. The list is this book's reading of HLPE's sentences, not a list HLPE prints. Each stage is an activity carried out by actors. [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11]

IN PLAIN TERMS. A food system is everything that happens to food, and everyone who does it, from the field to the bin.

Start with the plate in front of you and walk backwards. Someone cooked it. Before that, someone bought the food from a shop or a cart. Before that, it was moved by truck. Perhaps it was stored in a warehouse, or milled and packed in a factory. Before all of that, a farmer grew it. And after the meal, what is left over goes somewhere too.

A diet is what happens at the plate. Most of what reached the plate was decided at earlier stages, by other people.

Each step is done by somebody, such as a farmer, a trader, a mill owner, a shopkeeper or the person who cooks. Public bodies count too: HLPE says the actors at each step are "both public and private". Call each of them an actor — anyone whose decision moves the food on. Each step takes

things in, such as seed, fuel or grain. Each sends things out, such as grain, flour or a cooked meal.

As with any system (Book 0, E3), you choose where to draw the line round it.

Illustration 1. Here is the trap with the phrase "food supply chain". It sounds like the whole story. It is not.

Open HLPE's 2017 report Nutrition and food systems at https://www.fao.org/fileadmin/user_upload/hlpe/hlpe_documents/HLPE_Reports/HLPE-Report-12_EN.pdf and search inside it for "The food supply chain consists of". You land in section 1.2.1.

> *The food supply chain consists of the activities and actors that take food from production to consumption and to the disposal of its waste*

Read the next sentence, which lists the chain's steps: production; storage and distribution; processing and packaging; retail and markets. Count them. There are four, and the last one is the shop. Nothing in that list cooks the food, eats it or throws it away. A reader who stops here thinks the food system ends at the shop counter.

Now search for "A food system gathers". This is the definition, in the report's summary.

> *A food system gathers all the elements (environment, people, inputs, processes, infrastructures, institutions, etc.) and activities that relate to the production, processing, distribution, preparation and consumption of food, and the outputs of these activities*

Preparation and consumption are inside the system. The chain's own sentence has already put the disposal of waste inside it too. So the supply chain is one part of the food system, and the system is bigger.

Put the two sentences together and you get this book's eight stages. The chain gives production, storage, processing, distribution and retail. The definition adds preparation and consumption. The chain's first sentence adds waste.

WHERE THIS PICTURE BREAKS. The eight stages are this book's reading of two HLPE sentences, not a list HLPE prints. HLPE's own summary lists the chain's activities differently again: production, storage, distribution, processing, packaging, retailing and marketing. Quote HLPE's words when you quote HLPE, and call the eight stages this book's.

Illustration 2. Now draw a food system yourself. Take one roti made at home from packaged atta, and write the eight stages down the page. At each stage, write who acts, what goes in and what comes out.

The table below is a sketch of one likely route. Nothing in it has been checked against a source. Every line is a question you would need to answer before you could say it is true of your atta. A line is checked when a source says it: a trade or route study, the label, a government table.

Stage	What happens	Actor	Goes in	Comes out

Production	wheat is grown and harvested	farmer	seed, water, fertiliser, labour	grain
Storage	grain is held until it is sold or milled	farmer, trader or warehouse	grain	grain, some of it spoiled
Processing	grain is milled and packed	flour mill	grain, power, packets	packets of atta
Distribution	packets are moved to shops	distributor, transporter	packets, fuel	packets at the shop
Retail	a packet is sold	shopkeeper	packets, money	a packet in your kitchen
Preparation	dough is kneaded and cooked	whoever cooks	atta, water, fuel	rotis
Consumption	the rotis are eaten	the household	rotis	a meal eaten
Waste	what is left is thrown out	the household	scraps	scraps in the bin

Now draw a boundary round your kitchen. Only three stages sit inside it: preparation, consumption and waste. Atta crosses the line inward, and so does fuel. Scraps cross it outward. Everything else happened outside.

Draw a second boundary round the whole of India. All eight stages are now inside. What crosses the line is different: food bought from other countries comes in, and food sold to them goes out. Imports and exports are flows across that line, not a ninth stage. A tool that acts on them acts where the food enters or leaves. The two drawings are both correct. They answer different questions, exactly as Book 0, E3 said two boundaries round one situation would.

WHERE THIS PICTURE BREAKS. Real routes do not always run in this order or pass every stage. A farming family that eats its own wheat skips retail. A street vendor who cooks and sells does preparation and retail at once. Some grain is stored after milling as well as before. The eight stages are names for kinds of activity, not a fixed sequence every food must follow.

MUST KNOW POINTS FOR YOU.

- "Food system" is often heard as "farming". It is not. Farming is one stage of eight. When someone says a problem "comes from the food system", ask which stage they mean.
- Do not use "supply chain" and "food system" as if they were one thing. HLPE's list of supply-chain steps stops at retail and markets. Cooking and eating sit in the food system as consumer behaviour. A claim about the supply chain's steps says nothing about the kitchen.
- For any food, write the eight stages down the page. At each, name the actor, what goes in and what comes out. A stage you cannot fill is a question to check, not a blank to skip.
- Before you accept a figure about "the food system", ask what line was drawn round it. A kitchen, a state or the country? Household waste in or out? Food bought from abroad in or out? Two honest figures can differ only because their boundaries differ.

- "Food system" is a definition an expert panel adopted in 2014, not a fact of nature. Quote it as HLPE's definition, with the year, and expect other bodies to draw the system differently.
- The stage list tells you where things happen and who does them. It does not tell you how much food passes each stage, how much is lost there, or which actor has the most power. For any of those you need a number from a source, stage by stage.

EXERCISE 1 (interpretation). Take a packet of milk that you or your family buy. Write the eight stages for it. For each stage, name one actor, one thing that goes in and one thing that comes out. Then mark each line "checked" or "guessed".

EXERCISE 2 (critique). A speaker at a meeting says: "Obesity is a food system problem, so the answer is to help farmers grow healthier food." What has the speaker done with the phrase "food system"?

EXERCISE 3 (teaching). A first-year resident asks why this book says "food system" rather than "diet". You have ten minutes and a whiteboard. What do you draw, and what do you say?

2 · One fresh food from field to plate in India

Checked against the sources as they stood on 2026-09-25.

DEFINITION. Fresh produce in India commonly passes through several hands between the farm and the household. The Reserve Bank of India (RBI) working paper on tomato, onion and potato (Working Paper 08 of 2024) describes the onion route to Delhi, with costs gathered in the Nashik region in January 2023. Farmers mostly sell in a mandi run by an Agricultural Produce Marketing Committee (APMC), where the price is set by open auction. A trader buys with the help of commission agents. Mandi fees and commission charges are paid there.

The trader then deals with traders or wholesalers at a secondary mandi, such as Azadpur in Delhi. There, "Mandi fees and commission charges are also paid by the seller." Retailers buy at the secondary mandi and sell in neighbourhood markets.

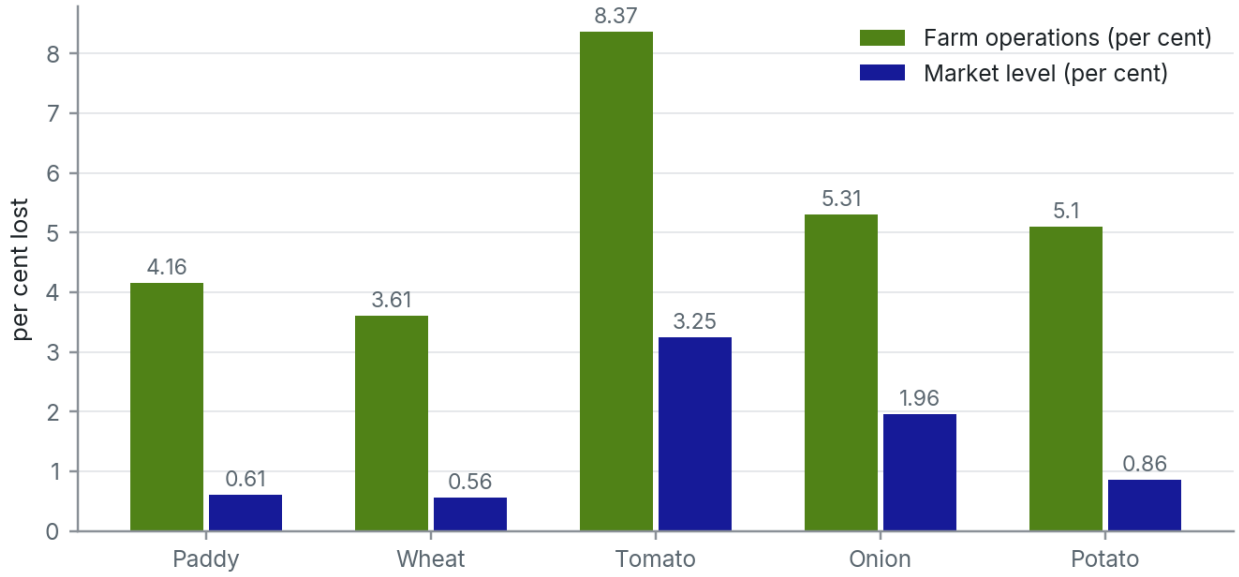
Food leaves the chain in two ways that are measured separately. The United Nations Environment Programme (UNEP) defines food loss as food that exits the supply chain "up to, and excluding, the retail level". It defines food waste as food and its inedible parts removed at retail, food service and household level. UNEP estimates India's household food waste in 2022 at 55 kg per person per year, with "Medium confidence", from seven local studies, urban and rural. [12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30]

IN PLAIN TERMS. An onion bought in Delhi has usually passed through several pairs of hands.

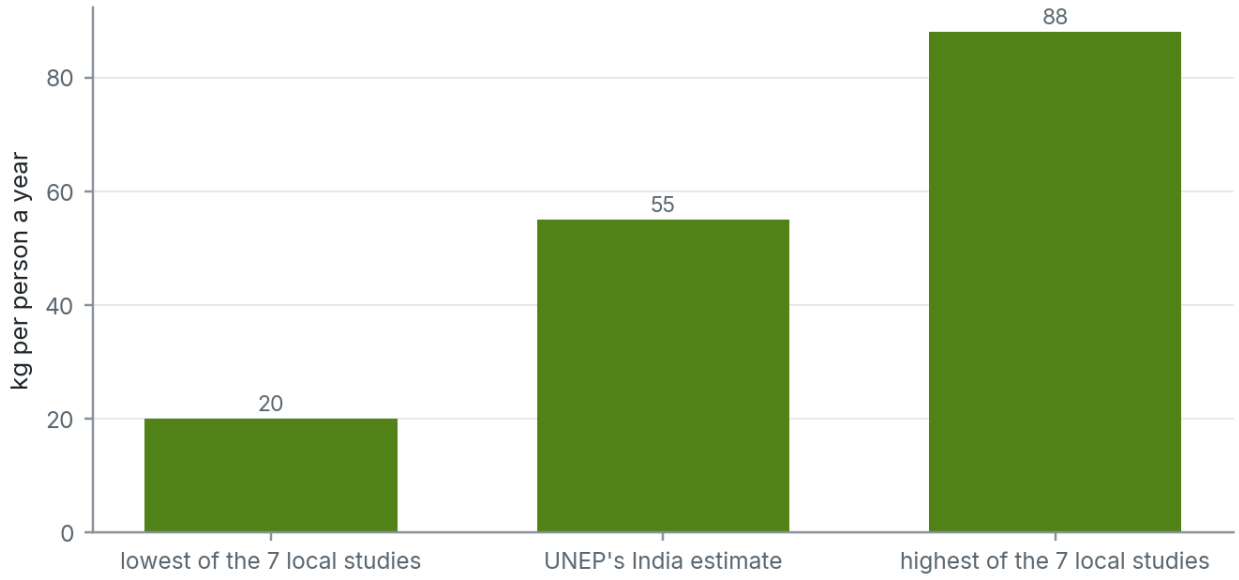
The farmer grows it and takes it to a mandi — a regulated wholesale market run under state law. There it is auctioned. A trader buys it, helped by a commission agent — a middleman paid a percentage for arranging the sale. At this sale a Reserve Bank paper records a mandi fee of 1 per cent and a commission of 4 per cent. It does not say what they are percentages of. Then the onions travel by truck to a big city mandi, and change hands again. A shopkeeper or vendor buys them there and sells them in your neighbourhood. Potatoes often sit for months in a cold store on the way.

Some food never reaches you. Food loss is what goes before the shop: spoiled in the field, dropped in sorting, rotted in a store. Food waste is what goes at the shop, in a restaurant or at home, and it counts peels and bones too.

India has numbers for both, and neither is exact. A United Nations agency estimates that in 2022 each Indian household member threw away about 55 kg of food.



Per cent lost after harvest, in farm operations and at market level, in a study by NABARD Consultancy Services (NABCONS) for reference years 2020-22, as the Ministry of Food Processing Industries reported it, which does not say per cent of what. Of these five, tomato loses most on the farm, 8.37 per cent; wheat least at market, 0.56 per cent. The release gives no total per crop.



Household food waste, kg per person a year (UNEP Food Waste Index Report 2024). India's figure of 55 sits inside the spread of the 7 local studies it was scaled up from, 20 to 88. It is a modelled estimate, rated medium confidence, not a national count.

Illustration 1. Follow one onion to Delhi. Open the Reserve Bank of India's working paper on tomato, onion and potato at https://www.rbi.org.in/Scripts/PublicationsView.aspx?id=22723 and search inside it for "In the case of onion".

> *In the case of onion, farmers mostly sell their produce in the APMC where prices are determined in an open auction system. [...] Once the auction is successful, it is bought by a trader with the help of commission agents, who pay the mandi fees (1 per cent), commission charges (4 per cent) and loading/unloading charges (₹ 9.02 per quintal).*

A quintal is 100 kg. Now read on to the end of the paragraph, and write down each hand the onion passes through. Your list should look like this.

Step	Who acts	What the paper says happens there
Farm	farmer	grows the onion; pays labour and transport to the mandi
Primary mandi	trader, commission agent, mandi	open auction; mandi fee 1 per cent, commission 4 per cent, loading Rs 9.02 per quintal
On the way	trader	packaging; weight lost, around 10 or 5 per cent depending on the season the onion was grown in
Transport	primary trader or city wholesaler	about Rs 240 per quintal to a secondary mandi such as Azadpur in Delhi
Secondary mandi	wholesaler	mandi fees and commission also paid, by the seller
Retail	retailer	sells in neighbourhood markets in the city
Kitchen	your household	buys, peels, cooks and eats; the peel goes to the bin

In the stages of section 1, this onion passes production, distribution, retail, preparation, consumption and waste. The paper describes no processing or storage on this route.

Look at the third row. The onion loses weight on the way before anyone has sold it to you. Some of that may be food loss. The paper counts it only as a cost the trader carries.

Now search the same paper for "Cold storages are the most important selling point". Potato takes a different route. Farmers in western Uttar Pradesh store it between March and November, at an average cost of Rs 250 to 260 per quintal. An open auction is held at the cold store, with the storage owner as go-between for farmer and trader. Some farmers skip the mandi altogether: those with contracts sell straight to processing companies. One crop can reach you by more than one route.

Figures quoted in this illustration are from [31].

WHERE THIS PICTURE BREAKS. This is one crop, on one route, to one city. The onion costs come from field visits in the Nashik region in January 2023, and the paper chose Delhi as the consuming city. Mandi fees and commission rates are set state by state, so another state's mandi charges other rates. The paper also names farmers selling tomato to organised retailers and potato under contract to processors, routes with fewer hands. Do not read the onion route as the route of every fresh food in India.

Illustration 2. Here is the trap with loss figures: read the unit before the number.

Open the Press Information Bureau release of 1 August 2025 on a study by NABARD Consultancy Services (NABCONS) for the Ministry of Food Processing Industries at https://www.pib.gov.in/

PressReleasePage.aspx?PRID=2151371&reg=3&lang=2 and scroll to Annexure-II, Table-1. Its column is headed "Quantity lost (Million MT)", that is, million tonnes. Read down it. Cereals, 12.49. Vegetables, 11.97. Then the last row: Eggs, 7363.00.

Stop there. Scroll up to Annexure-I in the same release. The country's whole production of fruits, vegetables, plantation crops and spices in 2022-23 was 337033 thousand tonnes, about 337 million tonnes. A loss of 7,363 million tonnes of eggs would be more than twenty times that. The row cannot be in tonnes. The release does not say what unit it is in, so do not use it at all.

Now go to Table-2. It gives two numbers for each crop, headed "Total loss in farm operations" and "Total loss in market level", both as per cent. Copy five rows.

Crop	Farm operations (per cent)	Market level (per cent)
Paddy	4.16	0.61
Wheat	3.61	0.56
Tomato	8.37	3.25
Onion	5.31	1.96
Potato	5.1	0.86

Two things stand out. In every row you copied, the farm figure is bigger than the market figure. And the soft vegetables, tomato and onion, lose more at both stages than the grains. Notice what the table does not give you: a total for each crop. It also never says per cent of what. So when you quote tomato, quote both numbers.

The farm-operations column is food loss in UNEP's sense. The market-level column is not cleanly either. The release's list of stages puts wholesalers, retailers, processing units and transport at market level, and retail is where UNEP's waste begins. Household food waste is counted elsewhere. Open UNEP's Food Waste Index Report 2024 at https://wedocs.unep.org/handle/20.500.11822/45230 and find India in Annex 3. The row reads 55 kg per person per year of household food waste, 78,192,338 tonnes a year, "Medium confidence". Now find Table 13. India has "7 medium confidence datapoints" for households and "No identified data" for food service or retail. Those seven are local studies, urban and rural, from 20 to 88 kg per person a year. UNEP scaled them up to the whole country's population.

Figures quoted in this illustration are from [32, 33].

WHERE THIS PICTURE BREAKS. The loss percentages are the ministry's summary of one study, for 2020-22, of 54 crops and commodities. The release does not say whether the farm and market percentages share a base, so adding them gives no total you can quote. The waste figure is modelled from seven local studies. UNEP's own definition of "medium confidence" says such an estimate "may be applicable only to a subnational population, such as a particular city". It also counts inedible parts such as peels and bones, which most people would not call wasted food.

MUST KNOW POINTS FOR YOU.

- Loss and waste are not two words for one thing. When someone gives you one number for "food lost and wasted in India", ask which of the two it is.

- Tomato loses 8.37 per cent in farm operations and 3.25 per cent at market level. That is the NABCONS study for 2020-22, as the ministry reported it in 2025. The release gives no total. Quote both figures, with the study and its years. Never add them: the release does not say whether they are per cent of the same quantity.
- India's household food waste in 2022, 55 kg per person a year, is UNEP's "medium confidence" estimate. It is built from seven local studies scaled to the national population. When a journalist quotes it as a national measurement, correct them. Say it is modelled, and that it counts peels and bones.
- Read a table's unit before any number in it. The eggs row of the ministry's loss table sits under "million tonnes" and cannot be tonnes. If a figure is absurd under its column heading, drop it and say why. Do not guess the unit the table left out.
- In the Reserve Bank paper's potato chain, mandi fees and commission are paid again at the secondary mandi. So a chain through two mandis pays those charges twice.
- To say where a fresh food came from, list the actors in order and the place each hands it on. Mark each one as checked in a source or guessed.
- A traced chain holds for the crop, route, city and years it was traced. Before you apply it to another vegetable, another state or another season, find a source for that one.

EXERCISE 1 (interpretation). Here are two rows of the ministry's summary of the NABCONS loss study, reference years 2020-22. Paddy loses 4.16 per cent in farm operations and 0.61 per cent at market level. Tomato loses 8.37 and 3.25. Say two things the rows show and two things they do not.

EXERCISE 2 (teaching). A journalist rings you. Their draft line reads: "Indian households throw away 78 million tonnes of food every year." You have three minutes. What do you tell them?

EXERCISE 3 (design). Pick one fresh food you or your household bought this week. Write down every hand it passed through from the farm to your kitchen. Mark each one "checked" or "guessed". For each guessed step, name the kind of source that could check it.

3 · A packaged food is many chains meeting

Checked against the sources as they stood on 2026-09-25.

DEFINITION. A packaged food made from several ingredients is where several supply chains meet.

The Food Safety and Standards (Labelling and Display) Regulations, 2020, made by the Food Safety and Standards Authority of India (FSSAI), govern what the label of a pre-packaged food must declare. Regulation 5(2)(b) requires the ingredients to be "listed in descending order of their composition by weight or volume, as the case may be at the time of its manufacture". The list therefore ranks the ingredients. It states an ingredient's percentage only where regulation 5(2)(g) requires one: where the label emphasises that ingredient in words or pictures, or where the ingredient characterises the food and leaving its percentage out would mislead.

Some ingredients may be declared under a class title. Sucrose may be declared as "Sugar", and glucose as "Dextrose or Glucose". Milk products may be declared as "Milk solids"; the label may also say where the solids came from, but need not. Spices, herbs and condiments may be declared together under one class title. An edible vegetable oil must be declared by the name of the specific oil.

The label must name the brand owner, who may be the manufacturer or only the marketer (regulation 5(6)). It must also show the brand owner's licence number, the number of the licence a food business holds under the Food Safety and Standards Act, 2006 (regulation 5(7)). If the manufacturer is someone else, its licence number must also appear; its name need not (regulation 5(7)(b)). A country of origin is required for food imported into India (regulation 5(12)). [34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49]

IN PLAIN TERMS. Turn over a packet of biscuits. The list of ingredients on the back is a map of farms.

Wheat flour came from wheat fields. Sugar came from a sugar crop and a sugar mill. Milk solids came from dairy animals. Then the packets travelled another chain to your shop.

The ingredients go in order of weight when the food was made, heaviest first (by volume for some liquid foods). So the first ingredient weighs more than any other single one.

The label also leaves a great deal out.

Illustration 1. Here is the trap with the address on a food packet. It looks like the place the food comes from. It is not.

Pick up any packet of biscuits and find the words "Manufactured by" or "Marketed by". Read the address under them.

Now open the Food Safety and Standards (Labelling and Display) Regulations, 2020, in FSSAI's compendium at https://www.fssai.gov.in/upload/uploadfiles/files/Comp_Labelling%20Display_Version%20VIII_09_09_2025.pdf and search inside it for "brand owner".

> *The name and complete address of the brand owner, whether or not, he himself is the manufacturer, marketer, packer or bottler, as the case may be, shall be declared on the label.*

So the address is the brand owner's. If your packet says "Marketed by", the company named there may never have baked a biscuit. Read on to regulation 5(7)(b). When the maker is someone else, the label must show the maker's licence number; it need not show its name. That number may be your only lead to the factory.

And nothing on the label leads past the factory. The address is not the mill that ground the flour, and not the farm that grew the wheat. The label tells you who answers for the packet. It does not tell you where the food came from.

WHERE THIS PICTURE BREAKS. Some packets are made by the brand owner itself, and then the address is the maker's. Food imported into India must also name its country of origin and its importer. The trap is assuming the address is the source without checking which of these cases you hold.

Illustration 2. Now read the list of ingredients as a map. The list below is made up, not copied from any real brand. It is written the way regulation 5(2) requires: "Ingredients: Wheat flour (Atta), Sugar, Edible vegetable oil (Palm oil), Dextrose, Milk solids, Choco chips, Iodised salt."

Two kinds of name on it need a word. "Sugar" is a class title — one name the regulation allows for a whole group of ingredients. "Dextrose" is another; it stands for glucose, which the regulation counts among sugars. "Choco chips" is a compound ingredient — one that is itself made of two or more ingredients.

Take the ingredients one at a time. For each, write the crop behind it and the chain it came up. The table is a sketch: the right-hand column is what you would still have to find out.

On the list	What the regulation lets it say	Where it starts	The chain before the factory	What the label does not tell you
Wheat flour (Atta)	the ingredient's own name	wheat	farm, trader, flour mill	which state, which mill
Sugar	"Sugar" may stand for sucrose	a sugar crop	farm, sugar mill	which crop, which mill
Edible vegetable oil (Palm oil)	the specific oil must be named	oil palm	plantation, oil mill, refinery	which country
Dextrose	"Dextrose" may stand for glucose	a crop the label does not name	farm, processor	which crop
Milk solids	"Milk solids" may stand for any milk product	milk	dairy farm, dairy plant	which dairy, which animal
Choco chips	a compound ingredient, named as such	several	several	its own ingredients, if under 5 per cent

Iodised salt	the ingredient's own name	salt	wherever the salt is made	where

Now test what the order can tell you. Wheat flour comes first, so it weighed more than the sugar at manufacture. But sugar appears twice, as "Sugar" and as "Dextrose". The rule ranks each named ingredient on its own. Added together, the two sweeteners might outweigh the flour, or might not. The list cannot say.

Last, look at "Choco chips". If they make up less than 5 per cent of the biscuit, the regulation does not require their own ingredients to be listed, apart from additives. Their sugar, fat and cocoa each came up a chain too. On this label, those chains are out of sight.

Figures quoted in this illustration are from [50].

WHERE THIS PICTURE BREAKS. The order is fixed at manufacture, by weight or by volume. It ranks ingredients and gives no amounts, unless regulation 5(2)(g) requires a percentage, as it does for an ingredient the label emphasises. A single-ingredient food, such as a packet of plain atta, needs no list at all. And a map drawn from the list stops at the factory door: which farms, mills and countries sit behind each line is for other sources to answer.

MUST KNOW POINTS FOR YOU.

- "The first ingredient is most of the product" is wrong. The first is only heavier than each other single ingredient.
- Add up an ingredient that appears under more than one name before you say where it ranks. Sugar and dextrose are listed as two lines, each in its own place. Together they may outrank the first ingredient.
- The address on a packet is the brand owner's, who may only market it. If the maker is someone else, the label must show the maker's licence number; it need not show its name.
- A compound ingredient (regulation 5(2)(e)) under 5 per cent of the food need not list its own ingredients, apart from additives. When you trace a product's chains, mark such an ingredient as a known gap, not as one chain.
- The label asks for a country of origin only on food imported into India. Do not read silence on the label as evidence that an ingredient is Indian.
- For any packaged food, read the first four or five ingredients as a list of farm chains.
- The list is one pack's ranking at manufacture, under one set of rules. It cannot tell you who supplied an ingredient, what it cost, or who kept how much of the price.

EXERCISE 1 (interpretation). A made-up packet of namkeen lists: "Ingredients: Gram pulse flour (Besan), Edible vegetable oil (Palmolein), Peanuts, Iodised salt, Spices and condiments." Name the chain behind each ingredient. Which ingredient hides more than one chain behind a single name, and which rule lets it?

EXERCISE 2 (critique). The front of a made-up packet says "Made with real milk" beside a picture of a glass of milk. The list shows "Milk solids" as the eighth ingredient, with no percentage.

A friend says: “Eighth means there’s hardly any milk in it.” What can you say, and what should you look for?

EXERCISE 3 (teaching). A health secretary asks why a packet of biscuits should concern anyone beyond the food regulator. Write the answer you would give, answer first, in no more than a page.

4 · Where the consumer's rupee goes: the price build-up

DEFINITION. The retail price of a unit of food is the price paid for it at the shop. The farm-gate price is the price the farmer received at the first sale. Retail price equals the farm-gate price plus the sum of everything added after it.

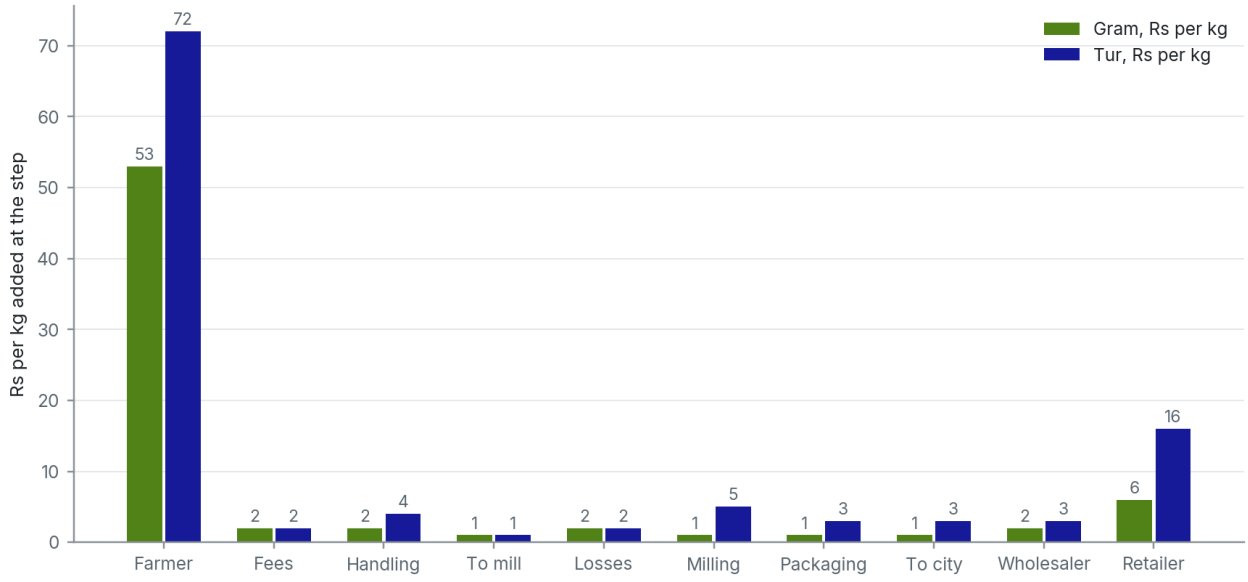
An actor's mark-up on a unit is its selling price minus its buying price. The mark-up pays for that actor's own costs of handling the unit, such as transport, fees and losses, and what is left after those costs is the actor's margin.

A mark-up or a margin can be written as a percentage only against a stated base. The same rupees give the larger percentage on the smaller base, which is always the buying price. [51, 52, 53, 54]

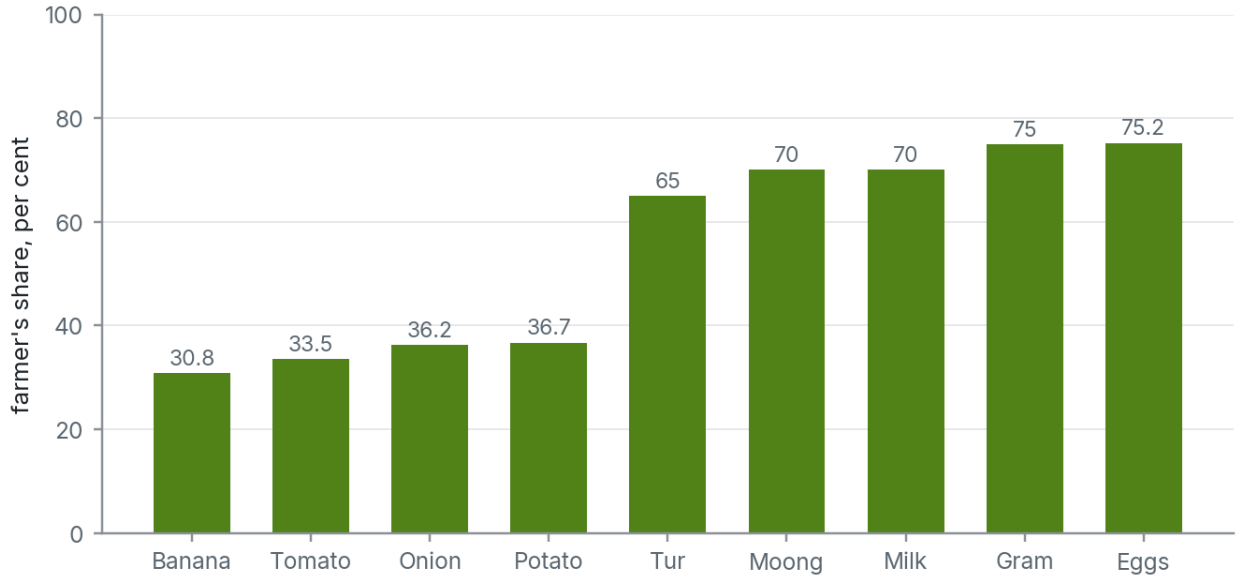
IN PLAIN TERMS. Take a kilogram of dal at a shop. Some of what you pay went to the farmer who grew it. The rest was added on the way. A fee at the market yard, a commission, a lorry, a mill, a packet, a wholesaler and the shopkeeper each added something.

A mark-up is often given as a percentage, and here is the trap. Six rupees added to a price of 65 is about 9 per cent of 65. The same six rupees is about 8 per cent of the 71 the shopkeeper sells at. Both are true. So whenever you see a percentage, ask what it is a percentage of.

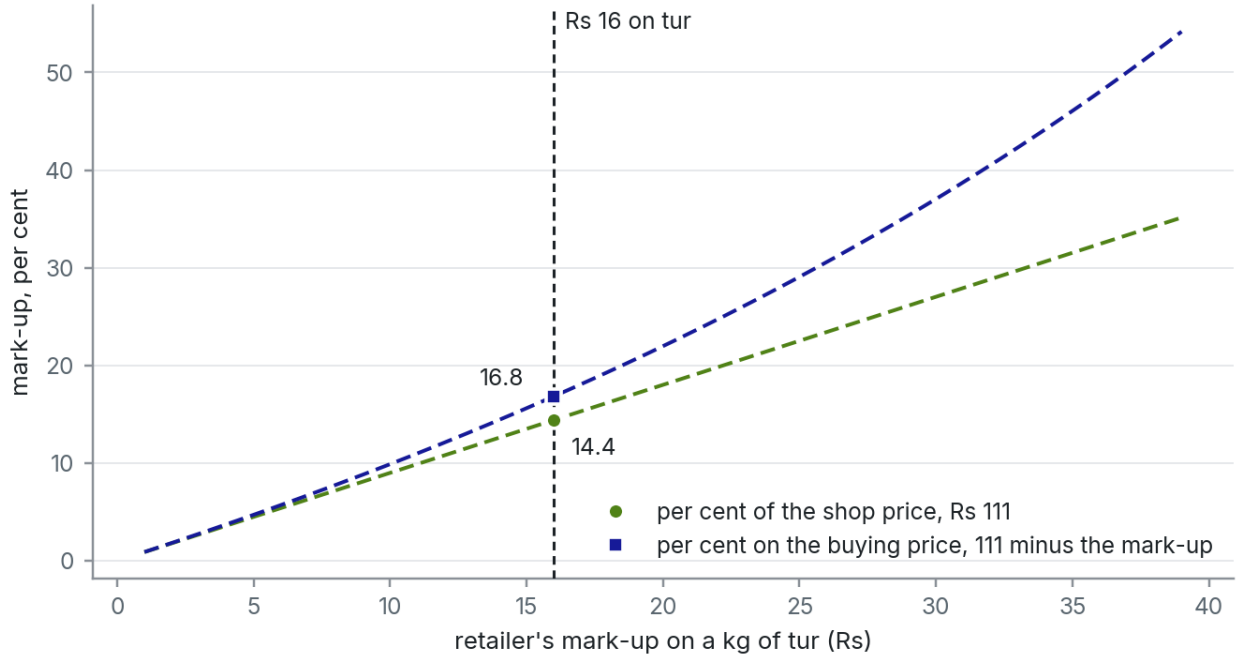
The farmer's share of the consumer rupee is the farmer's price divided by the shop price. If it is 75 per cent, then of every Rs 100 you pay, Rs 75 went to the farmer. The farmer still has to pay for seed, labour and the trip to the market out of that Rs 75.



Where a kilogram of pulse's retail price comes from, Rs per kg, Indore and Latur to Delhi, May 2023 (RBI Working Paper 07/2024). The farmer's bar is the largest for both; the parts add to Rs 71 for gram and Rs 111 for tur. The retailer's Rs 16 is the largest addition for tur.



The farmer's share of the consumer rupee, per cent, from RBI Working Papers 05, 06, 07 and 08 of 2024. Fruit and vegetables sit near a third; pulses, which keep, sit near two-thirds or more. Milk and eggs spoil and still sit high. Each bar is one route or group in one period.



One rupee mark-up, two percentages. For tur sold at Rs 111 a kg, a retailer's mark-up of x rupees is 100x/111 per cent of the shop price and 100x/(111 - x) per cent on the buying price. The two lines part as x grows: at Rs 16 they are 14.4 and 16.8 per cent.

Illustration 1. Two sections back, a fresh food went from a farm to a household through a chain of hands. Now put rupees on each hand.

Open the Reserve Bank of India (RBI) working paper *Pulses Inflation in India: A Study of Gram, Tur and Moong* (Working Paper 07/2024) at https://www.rbi.org.in/Scripts/PublicationsView.aspx?id=22722 and search for "Value Chain of Pulses with Mark-ups". The authors asked processors in Indore and Latur and recorded what happened to a kilogram between the mandi and a shop in

Delhi, in May 2023. The mandi is the regulated wholesale market where the farmer sells. The shop price is the one the Department of Consumer Affairs (DoCA) records.

Before you read a number, ask the four questions from Book 0, F1. One row is one step of the chain. The Rs columns give rupees per kilogram added at that step. The share columns give those rupees as a share of the final retail price. The source is a field survey. Here are the gram and tur columns.

Step	Gram, Rs per kg	Gram share, per cent	Tur, Rs per kg	Tur share, per cent
Farmer	53	75	72	65
Fees	2	3	2	2
Handling	2	3	4	4
To mill	1	1	1	1
Losses	2	3	2	2
Milling	1	1	5	5
Packaging	1	1	3	3
To city	1	1	3	3
Wholesaler	2	3	3	3
Retailer	6	8	16	14

Fees are the mandi's market fee and the commission agent's commission. To mill and To city are the two lorry trips, mandi to mill and mill to the wholesaler in the city. Losses are the dirt and stones cleaned out. The final retail price is Rs 71 a kilogram for gram and Rs 111 for tur. The ten steps fall in the production, processing, distribution and retail stages of section 1.

First, check that the rows build the price. Add the gram column from top to bottom.

```
53 plus 2 plus 2 plus 1 plus 2 plus 1 plus 1 plus 1 plus 2 plus 6 = 71
```

It closes. Now the farmer's share. Divide the farm-gate price by the retail price, which you can write as 53 ÷ 71, and multiply by 100, written × 100.

```
53 divided by 71 times 100 = 74.6 per cent
72 divided by 111 times 100 = 64.9 per cent
```

About 75 per cent for gram and 65 per cent for tur, as the table prints. Everything after the farmer added Rs 18 to a kilogram of gram and Rs 39 to a kilogram of tur.

```
71 minus 53 = 18
111 minus 72 = 39
```

Now the trap. Look at the retailer's row for gram: Rs 6, printed as 8 per cent. The retailer bought at the price before its own step and sold at 71.

```
71 minus 6 = 65
6 divided by 71 times 100 = 8.5 per cent
6 divided by 65 times 100 = 9.2 per cent
```

The same six rupees are 8.5 per cent of the selling price and 9.2 per cent on the buying price. The table uses the first base, and rounds to 8. Tur shows the gap more plainly.

```
111 minus 16 = 95
16 divided by 111 times 100 = 14.4 per cent
16 divided by 95 times 100 = 16.8 per cent
```

A shopkeeper who says "I add about 17 per cent" and a paper that says "the retailer takes 14 per cent" can be describing the same Rs 16.

One more check. The tur share column adds to 102, not 100. Each share was rounded to a whole number on its own, and the table's note says the shares "may not add up to 100 because of rounding off". Nothing is missing.

Figures quoted in this illustration are from [55].

WHERE THIS PICTURE BREAKS. Every figure here belongs to one route, one month and one set of processors: gram from Indore and tur from Latur to Delhi, in May 2023. The share on another route, in another month, or at another shop is not this one.

The rows are rupees added, not rupees kept. The table does not split any row into cost and margin. It cannot tell you whether any hand earned too much.

Illustration 2. Now a fresh vegetable, and a sentence that reads like a scandal.

Open the RBI working paper *Vegetables Inflation in India: A Study of Tomato, Onion and Potato* (Working Paper 08/2024) at https://www.rbi.org.in/Scripts/PublicationsView.aspx?id=22723 and search for "Traders' mark-up". The paper traces tomato from growing areas to shops in Delhi. It measures the farm-gate price by a wholesale price, the nearest price it could observe. Read the sentence, then stop.

> *Traders' mark-up of 21.3 per cent also includes transportation cost, mandi fees, commission charges, and loading/unloading charges (i.e., mark-ups include costs plus margin).*

Suppose you stopped at "21.3 per cent" and told a meeting that traders keep a fifth of the tomato rupee. Read the next sentence.

> *As per the calculations, traders earn an average of 5.3 per cent margin.*

The mark-up held the lorry, the fees and the loading. The margin is what was left. The paper does not say what the 5.3 is a percentage of, so do not subtract it from the 21.3. Take only what it plainly says: the margin is a small part of the mark-up.

Read the farmer's line the same way.

> *tomato farmers on an average receive 33.5 per cent of the consumer's price in Delhi (Chart 18). This, however, includes overhead costs of labour and transportation over and above his cost of cultivation.*

So Rs 33.50 of every Rs 100 reached the tomato farmer, and the farmer paid for labour and the trip to market out of it.

Now put the vegetables beside the pulses, and beside milk, eggs and bananas from the RBI's companion papers on fruits (Working Paper 06/2024, https://www.rbi.org.in/Scripts/PublicationsView.aspx?id=22721) and on milk, poultry meat and eggs (Working Paper 05/2024, https://www.rbi.org.in/Scripts/PublicationsView.aspx?id=22720).

Food	Farmer's share, per cent	Route or group, and period
Banana	30.8	Jalgaon to Delhi, April to July
Tomato	33.5	Growing areas to Delhi, three years to 2021-22
Onion	36.2	Several states to Delhi, peak months, three years to 2021-22
Potato	36.7	Agra to Mumbai, February to June, three years to 2022
Tur	65	Latur to Delhi, May 2023
Moong	70	Bhopal to Delhi, May 2023
Milk	70	Dairy cooperatives in Gujarat and Maharashtra, December 2022 and March 2023
Gram	75	Indore to Delhi, May 2023
Eggs	75.2	Three-year averages, major centres

Fruit and vegetables sit at about a third. Pulses, which keep, sit near two-thirds or more. The pulses paper gives its own reason: pulses "are non-perishable with relatively longer shelf life". The tomato paper says the retailer takes the largest margin because it "bears the maximum risk of perishability and wastage". But milk and eggs spoil and still sit high. The milk paper says "the cooperatives are the most efficient" at passing the rupee back. So perishability is not the whole story.

One row is missing on purpose. For poultry meat, the paper puts the share at 56 per cent, but for "farmers and aggregators taken together". A broiler farmer raising birds under contract for a company gets "about 5-6per cent of the consumer rupee" (the paper's spacing). Before you quote any farmer's share, find out who the paper counted as the farmer.

Figures quoted in this illustration are from [31, 56, 55, 57].

WHERE THIS PICTURE BREAKS. Each share is one route in one period, and the periods differ from food to food. The table is a comparison across papers that used different months, cities and

ways of getting the farm-gate price. It shows a pattern, fruit and vegetables against pulses. It does not rank any two neighbouring foods reliably.

A share cannot say whether anyone is paid too much. For that you need each hand's costs, which only some rows of some tables give.

Illustration 3. The arithmetic above divides one price by another for the same thing, a kilogram of tomato at the farm and a kilogram of tomato at the shop. Once the food is processed, the thing changes on the way, and the division stops being honest until you fix it.

Open the fruits paper at https://www.rbi.org.in/Scripts/PublicationsView.aspx?id=22721 and search for "Mark-ups in the Value Chain of Mango Processing". Totapuri mangoes from Chittoor are made into pulp. The farmer gets Rs 14 to 16 for a kilogram of raw mango. The pulp sells at Rs 30 to 35, and the row says what that price is for: "Rs. /0.5 kg of pulp". The paper adjusts the pulp price "using the ratio 1:0.5" so that it can be set against a kilogram of fruit.

With that adjustment, the farmer's share at the two ends of the ranges is this.

```
14 divided by 30 times 100 = 46.7 per cent
16 divided by 35 times 100 = 45.7 per cent
```

The paper prints 46 to 47 per cent. Now make the mistake on purpose. Take the pulp price per kilogram of pulp, which is twice the half-kilogram price, and divide as before.

```
30 times 2 = 60
14 divided by 60 times 100 = 23.3 per cent
```

Half the true share, because a kilogram of pulp is not what one kilogram of fruit became.

The same table splits a mark-up, as the definition does. The processor's rows for transport (Rs 2 to 3), labour (2 to 3), ripening and loss (0.5 to 1), and extraction and packing (3 to 4) are its costs. The row "Processor Margin 6.6 - 7.3" is what is left.

A packet of biscuits is this problem several times over. Flour, sugar, oil and milk solids each arrive by their own chain, each changes form in the factory, and the pack price also pays for things no row of these tables holds. The pulses paper notes in passing that processors "spend about Rs. 3–4 per kg for brand promotion activities", outside the table's rows. Splitting a packaged food's price by ingredient and actor is the work of the next rung of this subject.

Figures quoted in this illustration are from [56, 55].

WHERE THIS PICTURE BREAKS. The ratio is the paper's own adjustment for Totapuri pulp at Chittoor, April 2021. Another fruit, variety or product has its own ratio, and a product made of several ingredients has one for each. Without them the farmer's share of a processed food cannot be worked out.

MUST KNOW POINTS FOR YOU.

- "Farmers get a third, so middlemen pocket two-thirds" does not follow. In the RBI's tomato chain, traders' mark-up was 21.3 per cent and their margin 5.3 per cent (the paper does not say of what). The retailer's margin is the largest, and the paper does not give it.

- Ask what a percentage mark-up is a percentage of. Rs 16 on tur is 16.8 per cent on cost and 14.4 per cent of the shop price.
- The RBI's 2024 paper puts the Delhi tomato farmer's share at 33.5 per cent, on prices for the three years to 2021-22. Quote the food, the route and the period with the number.
- The RBI papers tie the low farmer's share of vegetables to perishability. Suppose a proposal raises it by cutting out a step. It then has to say who carries the spoilage, the storage and the display that the step was paying for.
- Check who the paper counted as the farmer. The RBI's poultry-meat figure of 56 per cent is for farmers and aggregators together.
- The farmer's share is measured on one route in one period. Do not use the share as the one in your district or this season.
- Before dividing a farm price by a shop price for a processed food, turn both into the same thing. Mango pulp sold by the half-kilogram is set against the kilogram of fruit it came from.

EXERCISE 1 (interpretation). Here is the moong column of the same RBI pulses table, in rupees per kilogram. From the farmer down it reads 77, 2, 3, 1, 2, 5, 2, 1, 2 and 15. The retail price was Rs 110 in Delhi, May 2023. The rows are the same steps as for gram and tur.

Name the hands a kilogram of moong passed through, in order. Give the farmer's share and the largest addition after the farmer. Then say one thing this column cannot tell you about any of those hands.

EXERCISE 2 (teaching). A journalist has three minutes and asks why tomato farmers get so little of what people pay. Explain the farmer's share of the consumer rupee without jargon, give one quotable sentence, and say plainly what the figure does not show.

PRACTICE. Thirteen problems on this technique, easiest first. Work them on paper before turning to the answers, which are in the appendix at the back under this section's name.

1. A seller buys a unit at 40 and sells it at 50. Give the mark-up in rupees, then as a percentage of the buying price, then as a percentage of the selling price.

2. A farm-gate price is 18 and the retail price of the same unit is 60. Give the farmer's share as a percentage, and the amount added after the farm gate.

3. (a) The farmer's share is 40 per cent and the retail price is 75. What was the farm-gate price?

1. The farm-gate price is 24 and the farmer's share is 30 per cent. What is the retail price?

4. A unit leaves the farm at 20. Three later steps add 5, 3 and 12. Give the retail price, then each of the four amounts as a share of the retail price.

5. In the RBI milk, poultry meat and eggs paper, the farm-gate price of eggs in the Delhi region was Rs 381 for 100 eggs in April 2021. The retail price was Rs 552 for 100 eggs. Give the farmer's share of the consumer rupee and the rupees added after the farm. Keep the unit on the second answer.

6. In the RBI pulses table, gram sold at retail in Delhi for Rs 71 a kilogram in May 2023. The retailer added Rs 6. Before the retailer, the wholesaler added Rs 2. Give the wholesaler's buying price, its mark-up as a percentage on that buying price, and its mark-up as a share of the retail price. Say which of the two the table prints.

7. The RBI tomato paper puts the tomato farmer's share at 33.5 per cent of the consumer's price in Delhi. Take Rs 100 spent on tomatoes by a Delhi shopper. How many rupees reached the farmer? How many went to every later step together? Then say what the farmer paid out of their part.

8. In the RBI fruits paper, mango sold fresh in April 2021 fetched the farmer Rs 62 to 67 a kilogram. It sold at retail for Rs 149 to 155 a kilogram. The paper prints the farmer's share as 42 to 43 per cent. Check that figure. Then give the widest range of shares the two price ranges allow.

9. The RBI milk paper looks at a leading Maharashtra cooperative in December 2022. Its rupees per litre are these.

Part of the price	Rs per litre
Payment to farmers	35
Procurement cost	3
Processing	2
Packaging	1
Transport	2
Cooperative's mark-up	1
Distributors' commission	1.5
Retailer's mark-up	3.5
Retail price	49

Check that the parts build the price. Give the farmer's share. Give the retailer's mark-up on its buying price.

10. Here is a worked answer. Find the step that broke.

```
the gram retailer's mark-up is 8 per cent, from the RBI table
so the retailer added 8 per cent to what it paid
buying price = 71 divided by 1.08 = 65.74
```

11. Here is a worked answer. Find the step that broke.

```
farmers get 33.5 per cent of the tomato rupee
farmers get 65 per cent of the tur rupee
a household spends Rs 100 on each
so farmers get 33.5 plus 65 = 98.5 per cent of its spending
```

12. A speaker at a district meeting says:

> *Tomato farmers get only a third of what we pay. The middlemen pocket the other two-thirds.*

Decide what to compute, compute it, and say what your answer does not establish.

13. A proposal reads:

> *Let tur farmers sell straight to consumers and the price of dal will fall by a third.*

Decide what to compute, compute it, and say what your answer does not establish.

5 · Who decides what is available, at what price, in what place

Checked against the sources as they stood on 2026-09-25.

DEFINITION. The food environment is the part of the food system where a person meets it. On the stages of section 1, it sits mostly at retail, where food is bought or obtained: the shop, the cart, the canteen. The definition used here is that of the High Level Panel of Experts on Food Security and Nutrition (HLPE). It names four key elements that influence food choice: availability and physical access (proximity); economic access (affordability); promotion, advertising and information; and food quality and safety.

Information here means what reaches the person about the food: a label, an advertisement, a leaflet. A label or an awareness campaign moves that element. It does not move what is there or what it costs.

Each element is set, before the consumer arrives, by decisions taken by actors further up the supply chain and by the state.

In the Indian chains the Reserve Bank of India (RBI) studied in 2024, these decisions are observable. Processors and aggregators contract for crops before harvest. Processors spend on brand promotion.

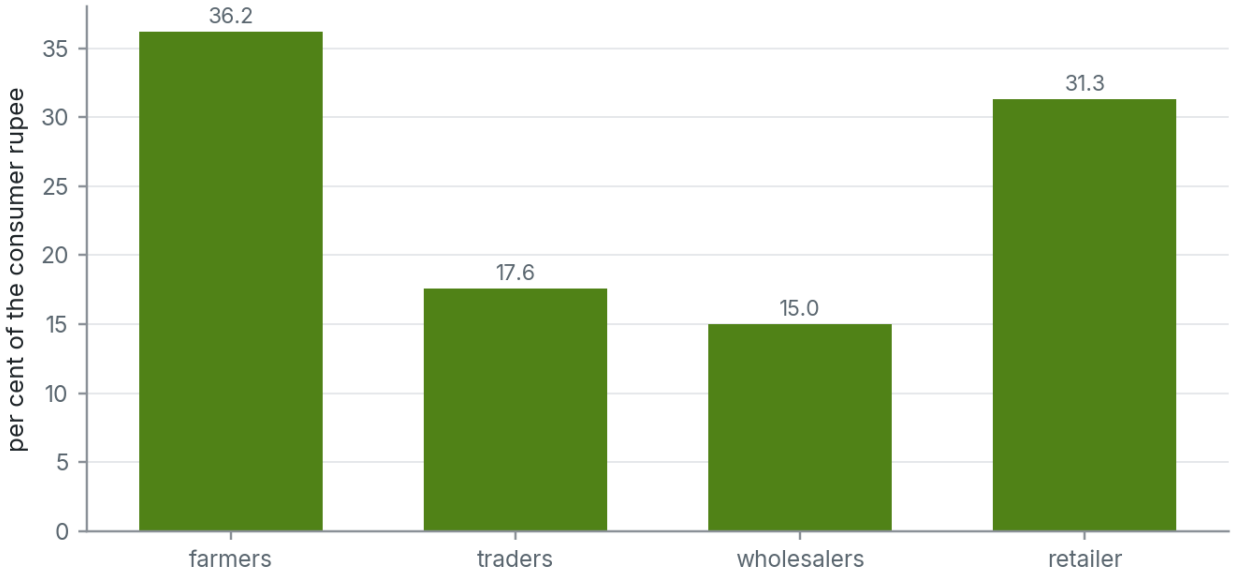
This is an observed feature of how the chains are organised, not a derivation. [58, 59, 60, 61, 62, 63, 64, 65, 66]

IN PLAIN TERMS. Stand at a vegetable cart or the shelf of a kirana, a small neighbourhood grocery, and look at what is there. Somebody decided what would be on it before you walked up.

A farmer decided what to plant. A trader decided which grade of onion went to which city. A state market committee set the fee on the first sale. A shopkeeper decided what to stock, at what mark-up, and what to put at eye level.

The place where all these decisions meet you is called the food environment. It has four parts that affect what you pick. What is there, and how near? What does it cost? How is it promoted? What quality is it, and is it safe?

You still choose. But you choose from a shelf that others filled. So when you want to know why people eat what they eat, ask about the shelf as well as the person.



Where the Delhi onion rupee went: the RBI paper's split of the consumer rupee, per cent (Working Paper 08/2024). Farmers 36.2, traders 17.6, wholesalers 15.0, the retailer 31.3. Four sets of hands each took a part; the four add to 100.1 as printed.

Illustration 1. Start with a leaflet from a health camp. It says: "Eat more vegetables and pulses. Cut down on fried snacks." Hand it to a woman standing at a vegetable cart in a Delhi neighbourhood market. Then ask what, on the cart in front of her, the leaflet changed.

Walk back along the onion on the cart. Open the Reserve Bank of India (RBI) working paper *Vegetables Inflation in India: A Study of Tomato, Onion and Potato* (Working Paper 08/2024) at https://www.rbi.org.in/Scripts/PublicationsView.aspx?id=22723 and search for "In the case of onion".

What is there. Onions reach Delhi from Maharashtra, Madhya Pradesh, Rajasthan and Gujarat "during different times of the year". Which state's onion is on the cart this month was decided by where farmers planted, and by traders who bought at mandis there and paid to move it.

What quality. The paper says onions reaching Delhi "are of 'A' grade quality and fetch the highest price". Somebody graded the onion before it reached Delhi. For potato the paper says farmers do the first sorting and grading.

What it costs. Search for "commission agents". At the first mandi, the paper records "the mandi fees (1 per cent), commission charges (4 per cent)". Now search for "Agricultural Produce Marketing Committees". The paper says these state committees "fix mandi fees, official commission charges, and user charges". So part of the onion's price was set by a state body at the first sale. The paper's split of the Delhi onion rupee is this: farmers 36.2 per cent, traders 17.6 per cent, wholesalers 15.0 per cent, retailer 31.3 per cent. Four sets of hands each took a part of the price.

How it is promoted. Loose onions carry no brand. Now open the RBI pulses paper at https://www.rbi.org.in/Scripts/PublicationsView.aspx?id=22722 and search for "brand promotion". Processors of packed pulses "spend about Rs. 3–4 per kg for brand promotion activities". The packet on the kirana shelf behind the cart was promoted. The onion was not.

Where. The paper says retailers buy at the secondary mandi and "sell it in the neighbourhood markets in urban areas". The cart is where it is because a retailer chose that street.

Now go back to the leaflet. It is information for the woman at the cart. It changed none of the other decisions above: not what reached Delhi, not the grade, not the fee, not the mark-ups, not where the cart stands. It may change which of the things on the cart she picks. That is all it can reach.

Figures quoted in this illustration are from [31, 55].

WHERE THIS PICTURE BREAKS. The onion's path is the one the RBI paper traced, to Delhi, from wholesale prices of the three years to 2021-22 and costs gathered in January 2023. A village haat, a supermarket or an app has a different set of deciders.

Knowing who decided each element does not tell you how much each decision changes what people eat. The paper measured prices, not diets.

Illustration 2. The onion's deciders acted after harvest. For some foods the decision is taken before the seed goes in.

Search the RBI tomato-onion-potato paper for "contract farming". Potato farmers who have contracts with companies making chips and snacks, and the paper names several, "sell it directly to the processors". The buyer was settled when the contract was signed.

Open the RBI fruits paper at https://www.rbi.org.in/Scripts/PublicationsView.aspx?id=22721 and search for "PHCs". Pre-harvest contractors "enter into a contract with farmers prior to the harvest season to fix prices, purchase quantities in tonnage". The price was fixed before the fruit was picked.

Open the RBI milk, poultry meat and eggs paper at https://www.rbi.org.in/Scripts/PublicationsView.aspx?id=22720 and search for "integrator model". Around 70 per cent of broiler farmers follow it, and the marketing of the birds "is taken care of by companies or private entities". Search the same paper for "NECC". The National Egg Coordination Council "declares daily region-specific farm gate prices for eggs". A national body declares a recommended farm-gate price for eggs each day.

Now set it out as a table. Each element of the food environment, and the actors these papers show deciding it.

Element	Who decides it, in the chains the RBI papers trace
What is there, and how near	Farmers, contracting processors, traders, retailers
What it costs	APMCs on fees, NECC's recommended egg prices, every hand's mark-up
How it is promoted	Processors and their brands
What quality, and is it safe	Farmers and traders who grade; the Food Safety and Standards Authority of India (FSSAI), on safety (section 3) |

One row is missing from every one of these papers: the state as a seller. The HLPE report lists, among the places where people get food, "schools, hospital and public canteens". There the state decides the whole plate. The state's own prices and rations come later in this book.

Figures quoted in this illustration are from [57].

WHERE THIS PICTURE BREAKS. Contracts, integrators and NECC prices are described for the products and places the papers studied: potato in western Uttar Pradesh, mango around Malihabad in Uttar Pradesh, broilers and eggs in Maharashtra and Haryana. How far they reach across India is not measured in these texts.

The table names deciders. It does not rank them, and it does not say which decision matters most for what people eat.

MUST KNOW POINTS FOR YOU.

- "People eat what they choose" leaves out half of it. People choose among what is there, at the price it is, promoted as it is, in the place it is sold. Others decided each of those first. Say both halves when you explain a diet.
- For any food on a plate, ask four questions in order. Then name who decided each. A question you cannot answer is a gap in the evidence, not a gap in the person.
- Advice changes only what the person knows and picks from the shelf. It leaves what is stocked, its price and where it is sold alone. When a plan relies on advice alone, name those.
- In clinic, treat a patient's account of what is sold near home, and at what price, as evidence about their food environment. It tells you which advice they can act on.
- In India a state body sets part of the price at the first sale. APMCs fix mandi fees and commission charges, and on the RBI's onion route to Delhi these were 1 and 4 per cent.
- Some choices are made before planting. A policy aimed at farmers' crop choices has to deal with whoever signed the contract.
- This method names who decides. It does not measure how much any one decision changes what people eat. Do not supply the number yourself.

EXERCISE 1 (critique). A district obesity plan contains one line on food.

> *Obesity will be tackled through awareness camps that teach people to choose healthy foods.*

Using the four elements of the food environment, find what the line assumes and say what it leaves out. Name one actor, other than the person, that the plan could have addressed for each element.

EXERCISE 2 (teaching). A first-year resident has ten minutes and a whiteboard. They ask why the department keeps talking about the food environment when the patient is the one eating. Explain it with a drawing, and end on what the idea does not tell you.

6 · Where a country's food comes from: production, imports, stocks

DEFINITION. Take one food and one stated period. A country's supply of that food for use within the country is its production, plus its imports, minus its exports, minus the rise in its stocks over the period (or plus the fall).

India's official series of per capita net availability of foodgrains, published in the Economic Survey's Statistical Appendix Table 1.19, applies the same identity with two further subtractions. Net availability is gross production, less seed, feed and wastage, less exports, plus imports, less the change in stocks. Net availability divided by the population gives per capita net availability in kilograms a year. Divided again by 365 it gives grams a day. The table states that these figures are not strictly representative of actual consumption.

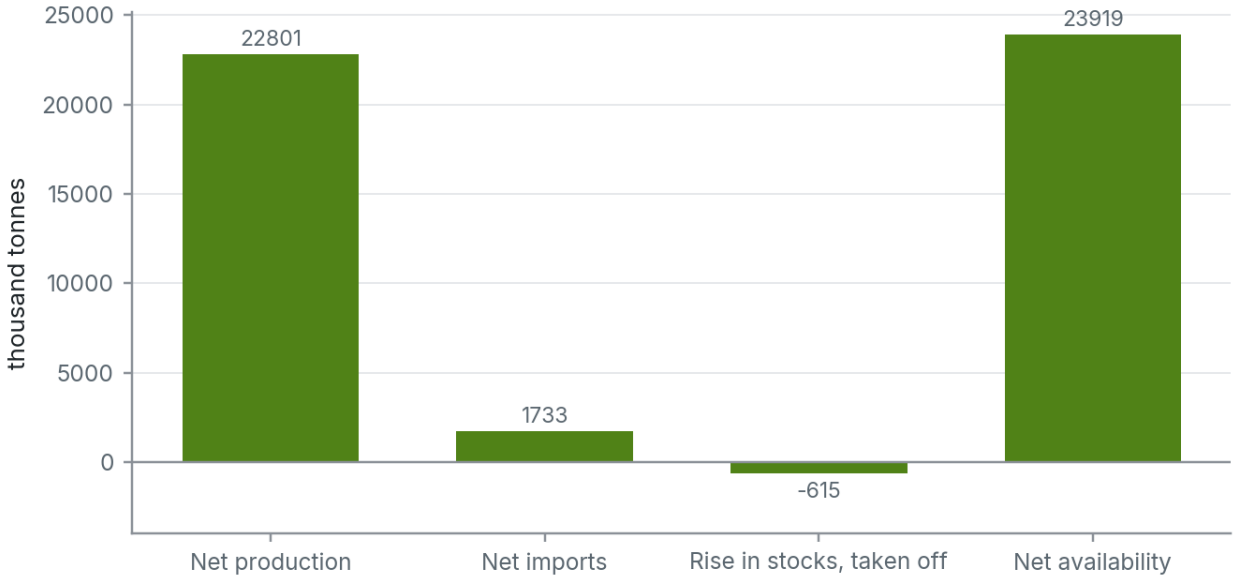
The Food and Agriculture Organization of the United Nations (FAO) defines an import dependency ratio (IDR): imports divided by production plus imports minus exports, times 100. Its self-sufficiency ratio (SSR) is gross production divided by the same total, times 100. Neither ratio uses the change in stocks. The two add to 100 only when exports are zero. A net imports figure, imports minus exports, is enough for the SSR and not enough for the IDR. [67, 68, 69, 70, 71, 72, 73, 74]

IN PLAIN TERMS. Where does the food a country eats in a year come from? Three places. What it grew, what it bought from abroad, and what it had put away in store.

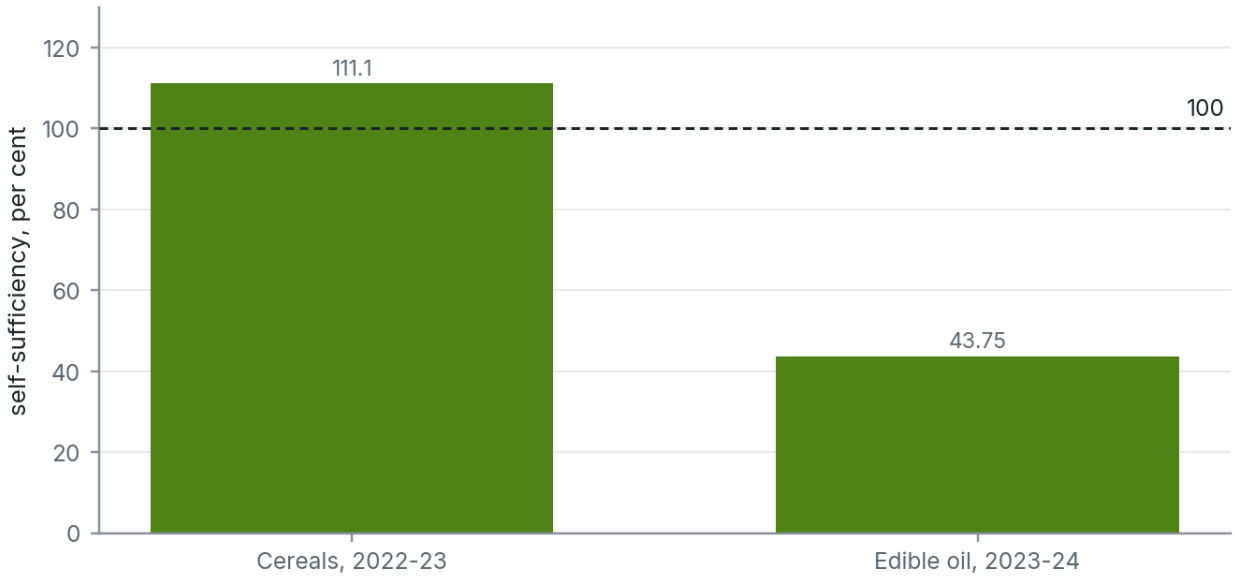
So start with what was grown. Add what came in from abroad. Take off what went out.

Two percentages tell you how much a country leans on the rest of the world. If the country exports nothing, the two add to 100. If it exports, they do not.

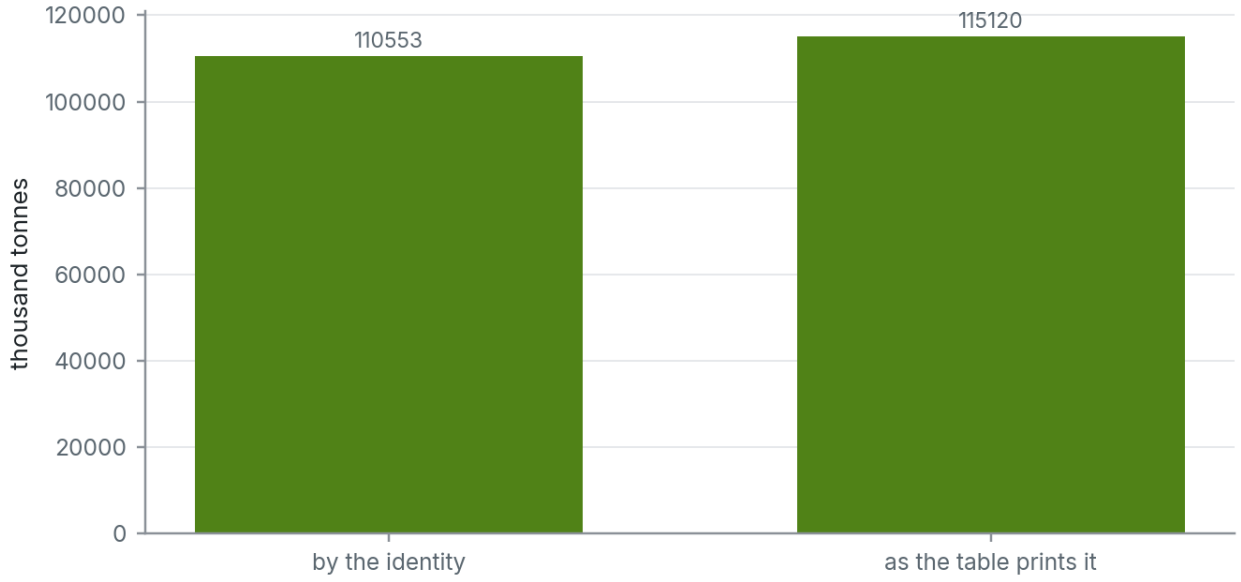
None of this says what anyone ate. It says what was there to be eaten.



India's pulses, 2022-23, thousand tonnes (Economic Survey 2025-26, Table 1.19). Net production plus net imports, minus the rise in stocks, gives net availability: 22801 plus 1733 minus 615 is 23919. The table prints the stock change as 615, a rise; it is drawn as -615 because a rise is taken off.



Self-sufficiency, per cent: production divided by production plus imports minus exports, times 100. Cereals in 2022-23 at 111.1 (Economic Survey, Table 1.19); edible oil in 2023-24 at 43.75, worked from the PIB's production and import figures with exports unknown and taken as zero (the release prints 43.74). The line at 100 is where a country grows exactly what it keeps.



India's rice, 2022-23, thousand tonnes (Economic Survey 2025-26, Table 1.19). Net production 125438, less net exports of 22347, plus the fall in stocks of 7462, gives 110553. The table prints 115120: the row misses its own identity by 4567.

Illustration 1. Start with the shortcut, because it is the one people take. India grew 26,058 thousand tonnes of pulses in 2022-23. Divide by the population and call it what Indians had.

Open the Economic Survey 2025-26 Statistical Appendix, Table 1.19, "Per Capita Net Availability of Foodgrains", at https://www.indiabudget.gov.in/economicsurvey/doc/stat/tab1.19.pdf. Find the block headed PULSES and the row for 2022-23. The population column is in thousand persons: 13,92,329 thousand, which is 139.2 crore, that is about 1.39 billion people. Dividing thousand tonnes by thousand persons gives tonnes a person.

```
26,058 divided by 13,92,329 = 0.018715 tonnes
0.018715 times 1,000 = 18.715
18.715 times 1,000 divided by 365 = 51.27
```

About 51 grams of pulses a person a day. The table says 47.1. The shortcut is 4 grams too high, and the table shows why. Now build the supply properly, from the same row.

Pulses, 2022-23	Thousand tonnes
Net production	22801
Net imports	1733
Rise in stocks, taken off	-615
Net availability	23919

Table 1.19 prints the stock change as 615, a rise. It is written -615 here because a rise is taken off.

Net production is the harvest less what was kept for seed, fed to animals or wasted before sale. Net imports are imports minus exports. The stocks rose by 615 thousand tonnes, so that much was stored rather than used, and it comes off. Say the identity in words: production plus imports minus exports minus the rise in stocks is what was available.

```
22,801 plus 1,733 minus 615 = 23,919
```

It closes exactly. Now share it out.

```
23,919 divided by 13,92,329 = 0.01718 tonnes
0.01718 times 1,000 = 17.18
17.18 times 1,000 divided by 365 = 47.07
```

About 17.2 kilograms a person a year and 47.1 grams a day, as the table prints. The shortcut counted seed, feed and waste as food, counted grain that went into store, and left out imports. In this year those errors did not cancel.

Now read the note under the table before you quote the 47.1 anywhere. The figures “are not strictly representative of actual level of consumption”. This is what was there to be eaten in the country as a whole. It is not what any household or person ate.

Figures quoted in this illustration are from [75].

WHERE THIS PICTURE BREAKS. The identity always holds, because it is only bookkeeping. The figures in it do not always hold. The table’s stock column does not count stocks held by traders, producers and consumers, by its own note. And a national average in grams a day says nothing about any state, household or person.

Illustration 2. Now run the identity on a row that does not close. It is a real one.

In the same table, find the block headed RICE and the row for 2022-23. Net production is 125438 thousand tonnes. Net imports are -22347: a minus sign in this column means India exported more rice than it imported, by 22,347 thousand tonnes. Change in stocks is -7462: the stocks fell. Printed net availability is 115120.

Take the rise in stocks off, as before. A fall is a negative rise, and taking off a negative number adds it.

```
1,25,438 minus 22,347 plus 7,462 = 1,10,553
1,15,120 minus 1,10,553 = 4,567
```

The row is 4,567 thousand tonnes short of its own printed total. Do the same with the rice rows for 2020-21 and 2021-22, and they close exactly. Do it with wheat for 2022-23 and it is out by 2, which is rounding. Of all the rows for single foods, one other fails: pulses in 2021-22, by 102. Only rice in 2022-23 is out by thousands.

The gap carries through. The CEREALS and FOODGRAINS totals for 2022-23 include rice, and each misses its own identity by 4,572. Turn that into grams a day, the same way as before.

```
4,572 divided by 13,92,329 times 1,000 times 1,000 divided by 365 = 9.00 grams
```

About 9 grams a person a day of the headline foodgrain figure for 2022-23, 568.8 grams, that the table’s own columns do not account for.

The table does not say why. The stock figure may have been revised, a column may carry a different definition that year, or there may be a slip. You cannot tell which from here, and you

should not guess. What you can do is say it plainly: "Table 1.19's 2022-23 rice row does not satisfy its own identity by 4,567 thousand tonnes, so I have not used the change between 2021-22 and 2022-23 without checking the Division's source." That sentence is what running the identity buys you.

Figures quoted in this illustration are from [75].

WHERE THIS PICTURE BREAKS. The identity finds a row whose parts do not add up. It cannot find a row whose parts add up and are all wrong together. A matched pair of errors passes it, as Book 0, C9 warned about stocks.

Illustration 3. The identity also tells you how much of a food came from abroad. Edible oil and cereals give opposite answers.

Open the Press Information Bureau (PIB) backgrounder *National Mission on Edible Oils* (8 December 2025) at https://www.pib.gov.in/PressReleasePage.aspx?PRID=2200287. Search for "12.18" and then for "15.66". India produced 12.18 million tonnes of edible oil in 2023-24 and imported 15.66 million tonnes. The release gives no edible-oil export figure, so leave exports out and say you did. The FAO's import dependency ratio is imports divided by production plus imports minus exports, times 100.

```
12.18 plus 15.66 = 27.84
15.66 divided by 27.84 times 100 = 56.25
12.18 divided by 27.84 times 100 = 43.75
```

Import dependence 56.25 per cent, the release's own figure, and self-sufficiency 43.75 per cent (the release prints 43.74). With exports taken as zero, the two add to 100.

Now cereals, from Table 1.19 for 2022-23. Gross production was 3,03,628 thousand tonnes and net imports -30,352: net exports. The table gives only imports minus exports, so the IDR cannot be worked out: it needs imports alone. The SSR can, because its denominator, production plus imports minus exports, is production plus net imports.

```
3,03,628 minus 30,352 = 2,73,276
3,03,628 divided by 2,73,276 times 100 = 111.1 per cent
```

Self-sufficiency of about 111 per cent. India grew more cereal than it kept. For edible oil, less than half of what it kept was home-grown.

One date to watch. The oil releases also give import duty rates, and those are out of date. On 24 September 2026 the PIB announced that the basic customs duty on crude sunflower oil had been cut to nil, and on crude soybean and crude palm oil to 5 per cent. Import figures and duty rates move on different clocks. Quote each with its own date.

Figures quoted in this illustration are from [76, 75, 77].

WHERE THIS PICTURE BREAKS. The two ratios compare a country's own production with what it kept. They say nothing about whether what it kept was enough, or too much, for the people eating it. And an SSR above 100 for all cereals together can sit beside heavy dependence on imports

of another food, as the oil figures show. The FAO adds that the ratios hold only if imports are mainly used at home and not re-exported.

MUST KNOW POINTS FOR YOU.

- Production is not supply. Write the identity out before you argue about any one term in it.
- A rise in stocks is subtracted and a fall is added. The FAO's handbook says so in as many words, and India's table follows it. Getting the sign wrong moves the answer by twice the stock change.
- India's official per capita net availability of foodgrains for 2022-23 is 568.8 grams a person a day (Economic Survey 2025-26, Table 1.19). It is what was there to be eaten, not what was eaten.
- India's edible oil imports were 56.25 per cent of its production plus imports in 2023-24, by the government's own figures: 15.66 million tonnes imported against 12.18 produced. When someone says India is self-sufficient in food, ask which food.
- Import dependence and self-sufficiency are not two halves of 100 unless the country exports nothing. Work each out from its own formula.
- Run the identity on every row of a supply table before you use the row. If a row misses by more than a few units of its last digit, say so and do not build a trend on it.
- Availability stops at the household door. Do not use availability as intake, and do not use a national average for a state or a family.
- Import figures and import duties change on different dates. Put the date beside every trade figure you quote.

EXERCISE 1 (interpretation). Here is the WHEAT row of Table 1.19 for 2022-23, in thousand tonnes.

Column	Thousand tonnes
Gross production	110554
Net production	97177
Net imports	-4682
Change in stocks	-10645
Net availability	103142

Population is 1392329 thousand.

Say what each of the two negative numbers means in words. Check that the row closes. Say whether wheat availability in 2022-23 was helped or reduced by stocks, and by how much.

EXERCISE 2 (teaching). A journalist has three minutes and asks: “Is India self-sufficient in food?” Answer without jargon, give one quotable sentence, and say how sure you are.

PRACTICE. Fourteen problems on this technique, easiest first. Work them on paper before turning to the answers, which are in the appendix at the back under this section’s name.

1. A country produces 800 units of a food in a year, imports 50 and exports 30. Its stocks rise by 20 over the year. What was the supply for use at home? Then give the answer if the stocks had fallen by 20 instead.

2. A supply of 73,000 tonnes of a food in a year is shared among 20,00,000 people. Give the supply in kilograms a person a year and in grams a person a day.

3. A country produces 30 units of a food, imports 70 and exports nothing. Give its import dependency ratio and its self-sufficiency ratio, and add them.

4. A country produces 90 units, imports 30 and exports 20. Give both ratios and their sum, and say why the sum is not 100.

5. The supply for use at home was 500. Production was 520, imports 10 and exports 40. What happened to stocks over the year, and by how much?

6. Table 1.19 of the Economic Survey 2025-26 gives, for foodgrains in 2022-23, net availability of 289063 thousand tonnes and a population of 1392329 thousand. Work out the per capita net availability in kilograms a year and grams a day, and keep the units.

7. Go the other way. The same table gives 568.8 grams a person a day of foodgrains for 2022-23, for 1392329 thousand people. What total net availability, in thousand tonnes, does that imply? Compare it with the printed 289063 and say why the two differ slightly.

8. The PIB backgrounder of December 2025 gives India’s edible oil production for 2023-24 as 12.18 million tonnes and imports as 15.66 million tonnes. Work out import dependence and self-sufficiency. Say which term of the FAO’s formula you had to leave out. Then compare your answers with the release’s own figures of 56.25 and 43.74 per cent.

9. The same backgrounder gives India’s per capita domestic consumption of edible oils in 2022-23. It was 10.58 kilograms a year in rural areas and 11.78 in urban areas. In 2004-05 the two figures were 5.76 and 7.92. Give each 2022-23 figure in grams a day, and the rural rise as a percentage of the 2004-05 figure.

10. Here is a worked answer. Find the step that broke.

```
pulses 2022-23: net production 22,801, net imports 1,733
change in stocks 615
supply = 22,801 plus 1,733 plus 615 = 25,149
```

11. Here is a worked answer. Find the step that broke.

```
cereals 2022-23: gross production 3,03,628, net imports -30,352
import dependence = -30,352 divided by 2,73,276 times 100 = -11.1 per cent
so India’s cereal import dependence is negative
```

12. Here is a worked answer. Find the step that broke.

```
foodgrains 2022-23: net availability 2,89,063, population 13,92,329
2,89,063 divided by 13,92,329 = 0.2076
so each person had 0.2 kilograms of foodgrain a year
```

13. A speaker says:

> *The edible oil mission will make India 72 per cent self-sufficient by 2030-31. Problem solved.*

The PIB backgrounder of December 2025 gives the mission's target. Domestic edible oil production is to reach 25.45 million tonnes by 2030-31, "meeting around 72% of our projected domestic requirement". Decide what to compute, compute it, and say what your answer does not establish.

14. A report says:

> *Per capita foodgrain availability rose from 514.6 grams a day in 2021-22 to 568.8 in 2022-23. Indians ate 54 grams more grain a day.*

Using Table 1.19, decide what to compute, compute it, and say what your answer does not establish.

7 · What Indians eat and spend on food, measured

Checked against the sources as they stood on 2026-09-25.

DEFINITION. India's Household Consumption Expenditure Survey (HCES) is run by the Ministry of Statistics and Programme Implementation (MoSPI). Its headline figure is the monthly per capita consumption expenditure (MPCE): a household's spending in a month, divided by the number of people in it. The share of a food group in MPCE is the group's MPCE divided by total MPCE, times 100.

In 2022-23, food took 46.38 per cent of MPCE in rural India and 39.17 per cent in urban India. Cereals and cereal substitutes took 10.75 per cent of rural MPCE in 2011-12 and 4.91 per cent in 2022-23. The group "beverages, refreshments and processed food" rose from 7.90 to 9.62 per cent rural and from 8.98 to 10.64 per cent urban over the same years.

These are shares of rupees spent, at the prices of each survey year, as the respondents reported them. The headline shares leave out the value of food received free through welfare programmes. From 2022-23 the survey records that food separately and reports a second set of estimates that includes it.

The National Sample Survey's Report 594, built on the same HCES rounds, converts the food each household recorded as consumed into energy with a conversion table. It gives an all-India average of 2,233 kilocalories a person a day in rural areas in 2011-12 and 2,212 in 2023-24. [78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96]

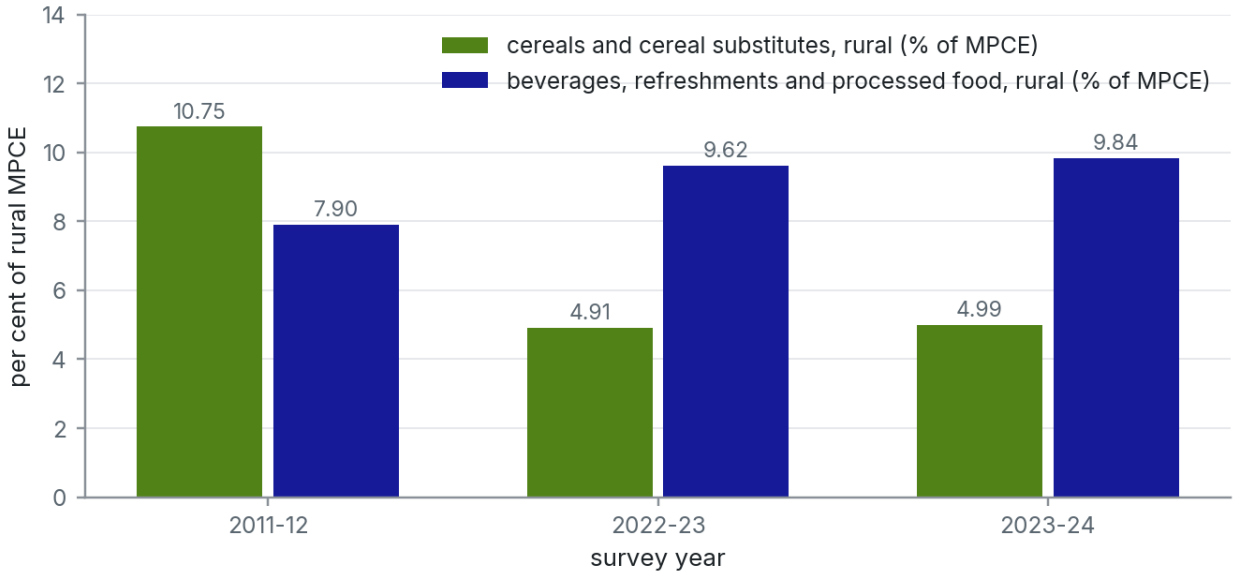
IN PLAIN TERMS. One government survey, used two ways, tells you most of what is known about Indian food at the scale of the country. It weighs nobody's plate.

The first use asks households what they spent. Divide what went on one kind of food by what went on everything, and you have that food's share of the budget.

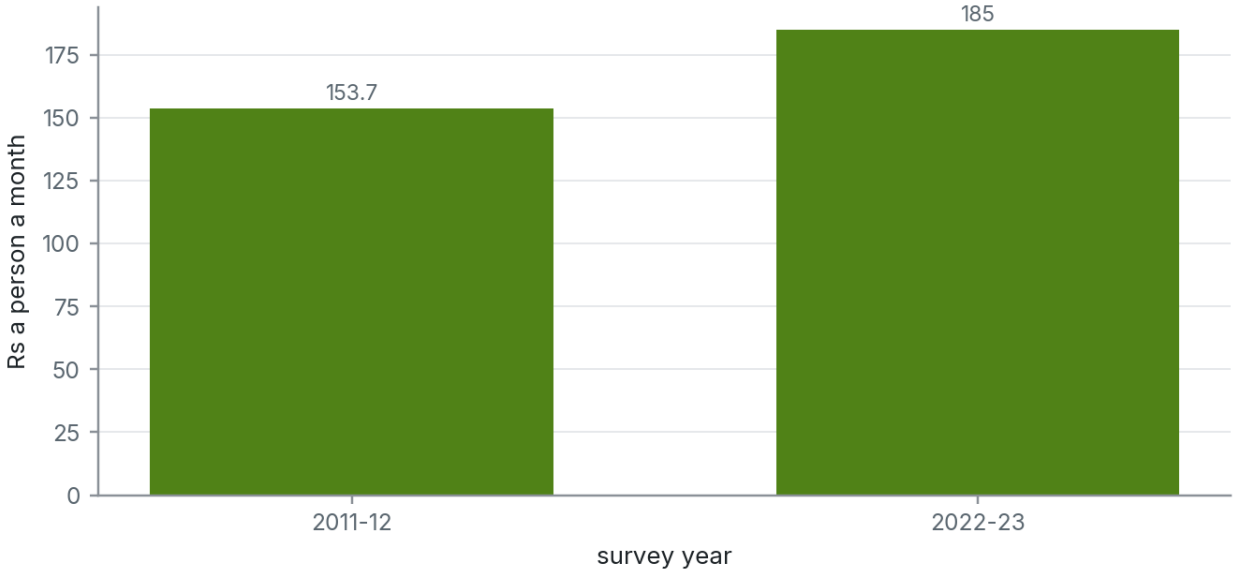
The survey's second use takes the quantities of food each household recorded. It turns those amounts into kilocalories with a table of how much energy each food holds. Between 2011-12 and 2023-24 its average hardly moved: about 2,200 kilocalories a person a day in rural India.

The budget changed shape a great deal. The energy total barely changed. A share of spending is a share of rupees. It is not kilograms and it is not kilocalories. Before you say what Indians eat, say which of these numbers you are reading.

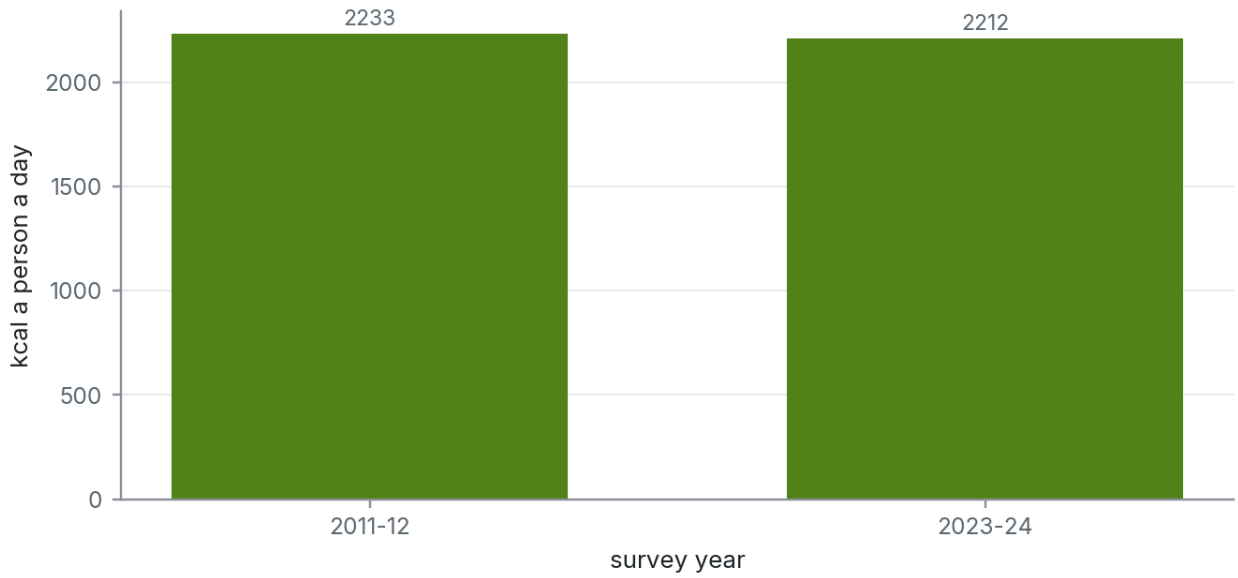
Rung 2 reads these changes against the nutrition transition. That is Popkin and colleagues' name for a shift in the world's diets towards processed food, edible oils and sweet drinks.



Share of rural MPCE, per cent, from the HCES. Cereals and cereal substitutes fell from 10.75 in 2011-12 to 4.91 in 2022-23 and 4.99 in 2023-24. Beverages, refreshments and processed food rose from 7.90 to 9.62 and 9.84. Shares of rupees, not amounts eaten. The first gap is eleven years, the second one year.



Rural spending on cereals and cereal substitutes, Rs a person a month, each year's own prices (HCES). 2011-12: 10.75 per cent of Rs 1,430, about Rs 153.7. 2022-23: Rs 185, up by 31.3 while the share fell to 4.91 per cent. Rupees, not grain.



Estimated rural energy intake, kilocalories a person a day (NSS Report 594). 2,233 in 2011-12 and 2,212 in 2023-24: almost no change, over the years in which cereals' share of the rural budget halved.

Illustration 1. Start with a sentence you could easily write, and watch it fail.

> *Cereals' share of rural spending fell from 10.75 per cent to 4.91 per cent between 2011-12 and 2022-23. So rural households now eat less than half the cereal they did.*

Open the Ministry of Statistics and Programme Implementation's *Survey on Household Consumption Expenditure, Fact Sheet: 2022-23* at https://www.mospi.gov.in/sites/default/files/publication_reports/Factsheet_HCES_2022-23.pdf. Find Statement 3. The two shares are there, in the rural column.

First, the size of the fall. A fall in a share can be said two ways, and Book 0's section on percentages (A4) taught both. In percentage points, subtract. As a per cent change, divide the fall by where it started.

```
10.75 minus 4.91 = 5.84
5.84 divided by 10.75 = 0.543
```

So the share fell by 5.84 percentage points, which is a fall of about 54 per cent of the old share. The sentence above is using the second number and treating it as a quantity eaten.

Now turn each share back into rupees. A share of MPCE times the MPCE gives the rupees. Statement 2 gives average rural MPCE: Rs 1,430 in 2011-12. Statement 5 gives the rupees on cereals in 2022-23 directly: Rs 185 a person a month.

```
1,430 times 10.75 divided by 100 = 153.7
185 minus 153.7 = 31.3
```

Rural households spent about Rs 154 a person a month on cereals in 2011-12 and Rs 185 in 2022-23. The rupees went up while the share came down. The share fell because everything else in the budget grew faster.

Even the rise in rupees is not a rise in grain. The factsheet says its values are nominal, as the respondents reported them: rupees of each year's prices. And from 2022-23 the headline figures leave out grain received free through the public distribution system (the PDS). The survey counts it only in a second set of estimates.

Last, the number that does speak to energy. Report 594 of the National Sample Survey puts rural intake at 2,233 kilocalories a person a day in 2011-12 and 2,212 in 2023-24. That is almost no change, while the cereal share halved. The report does not say, in the pages held here, whether its 2011-12 figure was worked out again with the 2025 conversion table, so treat 'almost no change' as approximate.

So the honest sentence is this. Cereals' share of the rural budget fell from 10.75 to 4.91 per cent. Over roughly the same years, estimated energy per person hardly moved.

Figures quoted in this illustration are from [97, 98].

WHERE THIS PICTURE BREAKS. The rupee figures hold for the all-India rural average in the years named, at each year's own prices. They say nothing about any one state, income group or household. The 2011-12 rupees and the 2022-23 rupees cannot be set side by side as amounts of grain, because prices changed in between and the survey did not report quantities of cereal here.

Illustration 2. Now work a share out yourself, then track it across one year.

Stay with Statement 5 of the 2022-23 factsheet. In rural India the average person's household spent Rs 363 a month on beverages, refreshments and processed food, out of Rs 3,773 on everything. The share is the part divided by the whole, times 100. Written with symbols, divided by is ÷ and times is ×, so the rule is part ÷ whole × 100.

```
363 divided by 3,773 is about 0.0962
0.0962 times 100 = 9.62
```

That is the 9.62 per cent the table prints beside it. Check one row like this whenever you first open a table. It tells you which column is the whole.

Read the footnote on that row before you name it: it "includes purchased cooked meals". So this group is not only packets and bottles. A thali eaten at a dhaba sits in it too.

Now 2023-24. The Press Information Bureau's release of 30 January 2025 gives 9.84 per cent rural and 11.09 per cent urban. Set them beside 2022-23.

survey	cereals and cereal substitutes, rural (% of MPCE)	beverages, refreshments and processed food, rural (% of MPCE)
2011-12	10.75	7.90
2022-23	4.91	9.62

survey	cereals and cereal substitutes, rural (% of MPCE)	beverages, refreshments and processed food, rural (% of MPCE)
2023-24	4.99	9.84

```
9.84 minus 9.62 = 0.22
4.99 minus 4.91 = 0.08
```

Beverages and processed food rose by 0.22 of a percentage point in rural India in one year. Cereals rose too, by 0.08 of a point. It was not a fall. Over eleven years the direction is clear. Over one year, the moves are small enough that you should not build a story on either.

Figures quoted in this illustration are from [97, 99].

WHERE THIS PICTURE BREAKS. The 2023-24 shares come from a press release that names only a few food groups. Only groups named the same way in both, such as these two, can be compared. Surveys before 2009-10 used a different reference period for some items, so a chain of shares back to 1999-00 mixes two methods.

MUST KNOW POINTS FOR YOU.

- A falling share of spending is not a falling amount eaten. Cereals' share of rural MPCE halved between 2011-12 and 2022-23 while the rupees spent on them rose, in each year's prices.
- Say points or per cent, every time. Cereals fell 5.84 percentage points in the rural budget, which is a fall of about 54 per cent of the old share.
- In 2023-24 beverages, refreshments and processed food was the largest food group in both rural and urban spending: 9.84 per cent of rural MPCE, followed by milk and milk products at 8.44 (Press Information Bureau, 30 January 2025). It includes purchased cooked meals. Neither the factsheet nor the 2023-24 release splits the group further, so no share of it can be called snacks or sweet drinks.
- The headline shares leave out the value of grain received free through welfare programmes. When you read cereal spending among poorer households, find the survey's second set of estimates, the one that imputes free items.
- Both uses of the survey count what a household bought or used, not what each person ate.
- Before you set two rounds side by side, check that they measured the same way. The factsheet puts 2009-10, 2011-12 and 2022-23 on the same basis, the modified mixed reference period (MMRP). Earlier rounds used another. Report 594 used a conversion table from a committee set up in 2025. Ask which table each calorie figure came from.
- When someone cites the nutrition transition for India, ask for the Indian numbers.

EXERCISE 1 (interpretation). Here are two rows of Statement 5 of the HCES 2022-23 factsheet, rural and urban India.

item group	MPCE rural (Rs)	MPCE urban (Rs)	share rural (%)	share urban (%)
milk & milk products	314	466	8.33	7.22
vegetables	203	245	5.38	3.80

Say what the table shows about milk and vegetables in town and village. Then say two things it does not show.

EXERCISE 2 (teaching). A journalist has three minutes. They want to write: "Indians now spend more on junk food than on cereals." Tell them what the survey supports, in words they can quote, and what it does not.

EXERCISE 3 (critique). A draft report says this.

> *Food's share of rural spending fell from 52.90 per cent in 2011-12 to 46.38 per cent in 2022-23. This shows that rural food security has worsened.*

Find the flaw.

PRACTICE. Twelve problems on this technique, easiest first. Work them on paper before turning to the answers, which are in the appendix at the back under this section's name.

1. A household spends 450 in a month, and 54 of it goes on one item. What share of the month's spending is that item, in per cent?

2. A share was 12 per cent and is now 9 per cent. Give the change in percentage points, and the change as a per cent of the old share.

3. A total is 2,000 and one item's share of it is 7.5 per cent. How much is the item?

4. In the HCES 2022-23 factsheet, rural households spent Rs 136 a person a month on edible oil, out of an MPCE of Rs 3,773. Work out edible oil's share of MPCE. The factsheet prints 3.59 per cent. Say why your answer may differ in the second decimal place.

5. Take urban India in 2022-23. The factsheet gives Rs 687 a person a month on beverages, refreshments and processed food. It gives Rs 235 on cereals and cereal substitutes. MPCE was Rs 6,459. Work out each group's share of MPCE. Then say how many times the first is the second.

6. Food's share of rural MPCE was 52.90 per cent in 2011-12 and 46.38 per cent in 2022-23 (HCES 2022-23 factsheet, Statement 3). Give the change in percentage points and as a per cent of the 2011-12 share.

7. Report 594 of the National Sample Survey gives urban per capita energy intake. It was 2,206 kilocalories a day in 2011-12 and 2,240 in 2023-24. Give the change in kilocalories a day and as a per cent of the 2011-12 figure, with the units kept on each.

8. In rural India in 2011-12, MPCE was Rs 1,430 and cereals and cereal substitutes took 10.75 per cent of it. In 2022-23 the factsheet gives Rs 185 on the same group. Work out the 2011-12 rupees,

then the change in rupees as a per cent of 2011-12. Then say what this does not tell you about cereal eaten.

9. Here is a worked answer. Find the step that broke.

```
cereals' share of rural MPCE: 10.75 per cent in 2011-12, 4.91 per cent in 2022-23
10.75 minus 4.91 = 5.84
so cereals' share fell by 5.84 per cent
```

10. Here is a worked answer. Find the step that broke.

```
urban MPCE 2022-23: food 39.17 per cent, beverages, refreshments and processed food
10.64 per cent
so beverages, refreshments and processed food are 10.64 per cent of urban food
spending
```

11. A press line reads: "Rural Indians now spend nearly twice as much on beverages and processed food as on cereals." Decide what to compute from the 2023-24 survey, compute it, and say what your answer does not establish.

12. In a meeting someone says: "Rural households spend a smaller share on food than in 2011-12, so they are eating less." Decide what to compute, compute it, and say what your answer does not establish.

8 · Built against hunger

Checked against the sources as they stood on 2026-09-25.

DEFINITION. India's central food institutions were set up in answer to shortages of grain. The Department of Food and Public Distribution (DFPD) says so in its own account. The Food Corporation of India (FCI) was set up in 1965, under an Act of 1964, because the country faced a major shortage of foodgrains, especially wheat.

The Department describes the FCI's job today in terms of grain. Its Annual Report 2025-26 calls the FCI the main instrument of the Government of India for procurement and distribution of wheat, rice and coarse grains, and for maintaining the buffer stock of foodgrains.

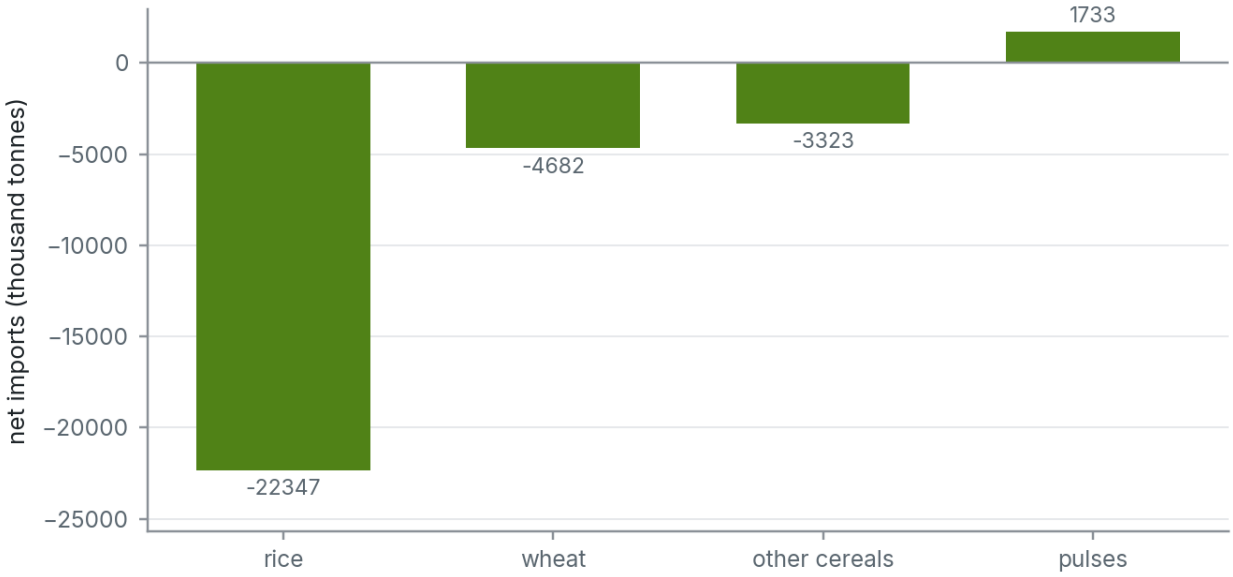
The national scoreboard is also a quantity. The Economic Survey 2025-26's Table 1.19 gives net imports of cereals for 2022-23 of minus 30,352 thousand tonnes: India exported more cereal than it imported.

The nutrition standards that the National Food Security Act, 2013 attaches to its meals are floors. No instrument quoted here sets an upper limit on energy, sugar, fat or salt. [100, 101, 102, 103, 104, 105, 106, 107, 108, 109]

IN PLAIN TERMS. The government's own history gives a plain answer. Each time, the trigger was too little grain. A Food Department was set up in 1942, in the war, because of acute food shortage. The ration shops of the public distribution system started in the 1960s to manage scarcity. What a ration shop hands out is grain, mainly rice and wheat.

So the tools were built to buy grain, store it, move it and sell it cheaply. Read how the Department describes the Food Corporation today. It is the main instrument for buying and distributing wheat, rice and coarse grains, the millets and other cereals besides those two. And the score the country keeps is in tonnes and grams of grain. By that score the shortage is over: in 2022-23 India sent out more cereal than it brought in.

Nothing in that design asks whether people eat too much of anything. That is not an oversight in a system built for obesity. It is a system built for a different problem, and it did what it was built to do.



Net imports in 2022-23, thousand tonnes (Economic Survey 2025-26, Table 1.19). Rice -22347, wheat -4682 and other cereals -3323 are net exports, together -30352. Pulses, 1733, are still a net import.

ILLUSTRATION. Open two instruments and one table, and ask each the same question: what does it count?

First, the Department of Food and Public Distribution's Annual Report 2025-26 (https://dfpd.gov.in/WriteReadData/AnnualRecordUploadDocuments/43bf089b-73cc-4329-aeb6-c883d2f2ea55_Food%20AR%202025-26%20English.pdf). Search it for "main instrument". Paragraph 3.64 comes up.

Procurement means the state buying grain from farmers. A buffer stock is grain held in reserve. Now read the whole paragraph again and look for "nutrition". It is not there.

Second, the National Food Security Act, 2013 (https://indiacode.gov.in/handle/123456789/496105). Go to Schedule II, "Nutritional Standards". A standard you must meet is a floor. Look along each row for a maximum, or for sugar, fat or salt. There is none.

Third, the Economic Survey 2025-26, Statistical Appendix, Table 1.19 (https://www.indiabudget.gov.in/economicsurvey/doc/stat/tab1.19.pdf). This is the scoreboard. Find the 2022-23 rows. Net imports, in thousand tonnes, read like this.

group	net imports 2022-23 (thousand tonnes)
rice	-22347
wheat	-4682
other cereals	-3323
pulses	1733

A minus sign here means India sent out more than it brought in.

The system built to end a grain shortage now exports more cereal than it imports. In 2022-23 it also drew its cereal stocks down by 18,155 thousand tonnes.

None of them has a place to record too much.

Figures quoted in this illustration are from [75].

WHERE THIS PICTURE BREAKS. The net import figures hold for the financial year 2022-23 and for all India. They describe grain available, not grain eaten. They say nothing about any state or household, and a single year of trade can swing with one harvest.

MUST KNOW POINTS FOR YOU.

- "Indian food policy ignored nutrition" is the wrong charge. It was built against a grain shortage and keeps score in tonnes of grain. By that measure it has ended the shortage it was built for.
- Before you ask an institution to do nutrition work, read what the state says it is for. A plan for it to buy vegetables or oils changes its job. Argue it as a change, not as a small fix.
- In 2022-23 India's net imports of cereals were minus 30,352 thousand tonnes, a net export of about 30 million tonnes (Economic Survey 2025-26, Table 1.19).
- The nutrition standards in Schedule II of the National Food Security Act are floors, "required to be met".
- The PDS was never meant to be a whole diet. The Department calls it "supplemental in nature". Do not judge the ration as if it had to supply everything a family eats.
- The departmental histories give the state's own reasons, in its own words. Do not quote an annual report as proof of what happened in 1965.
- Grams of foodgrain available a day per person is not grams eaten. Do not set it beside a requirement as if it were intake.

EXERCISE 1 (teaching). Write one page for a health secretary, answer first. The question is: "Why does the ration give rice and wheat, and nothing that would help with obesity?"

EXERCISE 2 (critique). A draft article says: "The fact that India now exports cereals proves its people are well fed." Find the flaw, using only what this section has shown you.

EXERCISE 3 (retrieval). The Department of Food and Public Distribution's Annual Report 2025-26 gives the Food Corporation of India three jobs. Name them, and the grains they apply to. Then give the year the Department's history gives for the Corporation's setting-up.

9 · Minimum support price and procurement

Checked against the sources as they stood on 2026-09-24.

DEFINITION. Section 2(10) of the National Food Security Act, 2013 defines the minimum support price (MSP). It is the assured price announced by the Central Government at which foodgrains are procured from farmers, for the central pool. Section 2(2) defines the central pool as the stock of foodgrains procured through minimum support price operations.

The Act's definition is for foodgrains bought into the central pool. It does not set any price. Each season's MSP for the kharif and rabi crops rests on a Cabinet decision.

The Commission for Agricultural Costs and Prices (CACP) recommends the MSP, and the Cabinet Committee on Economic Affairs (CCEA) decides it. Since 2018-19, following the Union Budget 2018-19 announcement, MSP has been set at not less than 1.5 times the all-India weighted average cost of production.

Sugarcane has no MSP. The Union Government fixes a fair and remunerative price (FRP), also on CACP's recommendation, which sugar mills pay for the cane they buy.

Procurement differs by crop. Wheat and paddy that meet the prescribed specifications are bought at MSP by the Food Corporation of India (FCI) and State agencies. A farmer may sell to them or in the open market. Pulses, oilseeds and copra are procured under the Price Support Scheme of PM-AASHA (Pradhan Mantri Annadata Aay Sanrakshan Abhiyan) when their market price falls below MSP. The scheme was approved up to 2025-26; check for its renewal before describing it as running. Cotton and jute are procured through the Cotton Corporation of India and the Jute Corporation of India.

As of 24 September 2026: MSP for common paddy in kharif marketing season 2026-27 is Rs 2,441 per quintal, a quintal being 100 kilograms (CCEA, 13 May 2026). MSP for wheat in rabi marketing season 2026-27 is Rs 2,585 per quintal (CCEA, 1 October 2025). [110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125]

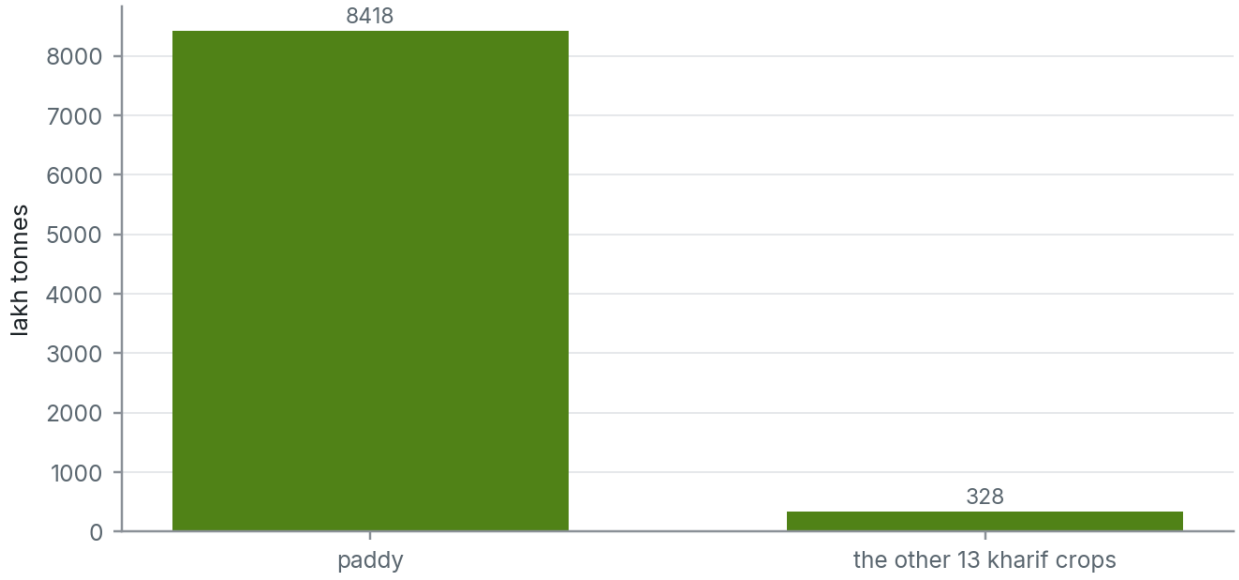
IN PLAIN TERMS. Before each season the Union Government announces a minimum support price, or MSP, for 22 crops. Most are announced in two rounds, one for the kharif crops and one for the rabi crops. Those are the names the releases use for India's two main crop seasons. Paddy is on the kharif list and wheat on the rabi list. Jute and copra are listed apart, as commercial crops.

A body of experts, the Commission for Agricultural Costs and Prices (CACP), recommends the price. A committee of the Cabinet fixes it.

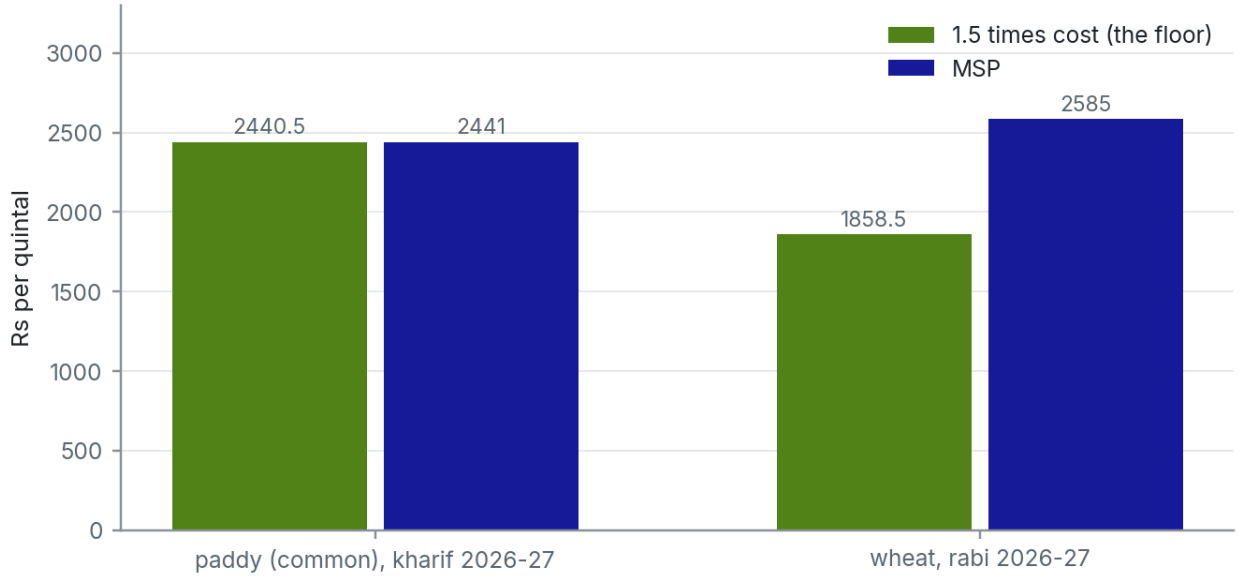
Here is the trap. An MSP is a price at which the government will buy. It is not a price every farmer gets.

The grain that is bought goes into the central pool, the government's own stock. So what the state buys decides what it can hand out.

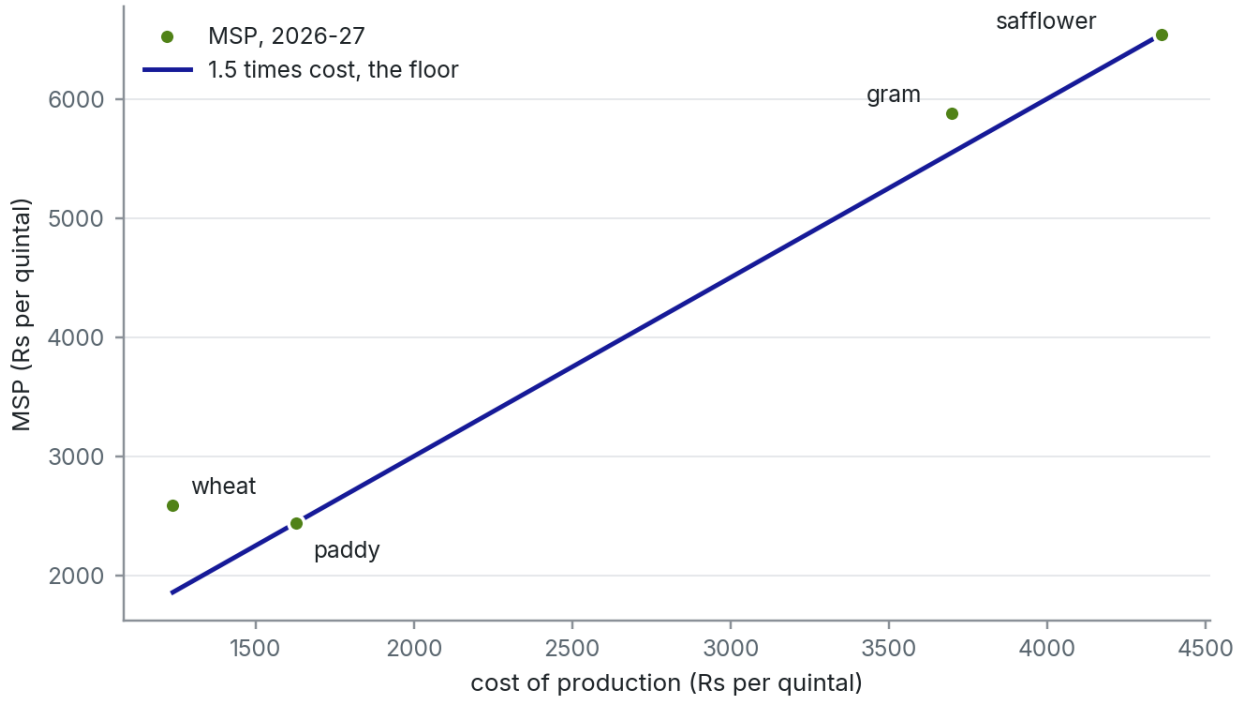
Sugarcane is different. It has a fair and remunerative price (FRP), fixed the same way, which sugar mills must pay for the cane they buy.



Kharif crops bought at MSP, 2014-15 to 2025-26, lakh tonnes (CCEA release, 13 May 2026); a lakh is 100,000. Paddy 8418; the other 13 crops together 328. Total 8746.



MSP against the 1.5 times floor, Rs per quintal, 2026-27 seasons. Paddy (common): floor 2440.5, MSP 2441. Wheat: floor 1858.5, MSP 2585, 726.5 above.



MSP against the CACP's cost, Rs per quintal, 2026-27 seasons: paddy (common, kharif), and wheat, gram and safflower (rabi). The line is the 1.5 times floor. Paddy and safflower sit on it; gram sits above it and wheat far above.

Illustration 1. Start with a sentence that sounds right and is not.

> *The MSP for moong is Rs 8,780 a quintal, so moong farmers get Rs 8,780.*

A quintal is 100 kilograms. Open the Press Information Bureau release of 13 May 2026, "Cabinet approves Minimum Support Prices (MSP) for Kharif Crops for Marketing Season 2026-27", at https://www.pib.gov.in/PressReleasePage.aspx?PRID=2260617. Find the moong row. The MSP is there: Rs 8,780 per quintal for kharif marketing season 2026-27. The table does not say who will pay it.

Now open the Press Information Bureau backgrounder of 10 October 2025, "Minimum Support Prices: From Safety Net to Self-Sufficiency", at https://www.pib.gov.in/PressNoteDetails.aspx?ModuleId=3&NoteId=155448&reg=48&lang=2. Search for "Procurement is triggered". Pulses are bought under the Price Support Scheme "when the market price of these crops falls below MSP". The same paragraph names the buyers. They are the National Agricultural Cooperative Marketing Federation of India (NAFED) and the National Co-operative Consumers' Federation of India (NCCF).

So a moong farmer gets the MSP only by selling to one of those agencies, at a time when they are buying. The market price may sit below the MSP, above it, or near it. The announced price is a promise with conditions, not a price paid on every sack.

Now the clean case. Search the Department of Food and Public Distribution's Year End Review 2025 (https://www.pib.gov.in/PressReleasePage.aspx?PRID=2210211) for "specified centres". Wheat and paddy that meet the specifications and are offered at specified centres "are bought by the public procurement agencies" at MSP. That is an open door at a fixed price. The review gives

the size: 832.17 lakh tonnes of paddy in kharif marketing season 2024-25. A lakh is 100,000, so that is about 83.2 million tonnes. Wheat was 300.35 lakh tonnes in rabi marketing season 2025-26, about 30 million tonnes.

Last, see where the buying lands. The kharif release of 13 May 2026 gives procurement from 2014-15 to 2025-26: 8,418 lakh tonnes of paddy, and 8,746 lakh tonnes for all 14 kharif crops together. Work out paddy's share.

```
8,418 divided by 8,746 is about 0.962
8,746 minus 8,418 = 328
```

Paddy was about 96 per cent of all kharif crops bought in those years, by weight. The other 13 crops together came to 328 lakh tonnes. MSP is announced for 14 kharif crops. The buying is overwhelmingly one.

Figures quoted in this illustration are from [126, 127].

WHERE THIS PICTURE BREAKS. The share is by weight, over twelve marketing seasons together, for the kharif crops only. The figures are for paddy, not milled rice, and cotton is in the total. So the share is not a share of food. The releases held give no conversion from paddy to rice. It does not say which states the grain came from or how many farmers sold at MSP. The releases held here do not give those.

Illustration 2. The 1.5 times rule is a floor, and crops sit at very different heights above it. Check two.

The kharif release gives common paddy for 2026-27 a cost of Rs 1,627 per quintal and an MSP of Rs 2,441. The rabi release of 1 October 2025 gives wheat for 2026-27 a cost of Rs 1,239 and an MSP of Rs 2,585. Multiply each cost by 1.5 to find the lowest MSP the rule allows.

```
1,627 times 1.5 = 2,440.5
1,239 times 1.5 = 1,858.5
```

Paddy's MSP of Rs 2,441 sits on the floor, rounded to the rupee. Wheat's Rs 2,585 sits well above it.

```
2,585 minus 1,858.5 = 726.5
```

Rs 726.50 a quintal above the floor. So "MSP follows the 1.5 times rule" is true of both, and tells you almost nothing about either. Ask for the crop and the season.

One more check before you use these costs. The release defines cost as paid-out costs plus the imputed value of family labour. That is the CACP's all-India average. It is not the cost on any one farm.

Figures quoted in this illustration are from [126, 128].

WHERE THIS PICTURE BREAKS. The costs and prices are for the named seasons only: kharif 2026-27 and rabi 2026-27. The next CCEA decision replaces them. The rule compares MSP with an

all-India average cost, so a farm with higher costs can be below 1.5 times its own cost at the same MSP.

MUST KNOW POINTS FOR YOU.

- An MSP is the price at which government agencies will buy, not the price every grower is paid. When someone quotes an MSP as a farmer's income, ask how much of the crop was bought at it.
- From 2014-15 to 2025-26, 8,746 lakh tonnes (about 875 million tonnes) were bought across the 14 kharif crops. Paddy was 8,418 of them, about 96 per cent by weight (CCEA release, 13 May 2026). Among the kharif crops, procurement is concentrated in one.
- Say who fixed a price and for which season. A figure without its season is out of date the day the next decision comes.
- What the state buys at MSP is what it can put in a ration. A proposal to change the ration basket is also a proposal about procurement.
- Sugarcane has no MSP. Its price is the fair and remunerative price, and sugar mills pay it. Do not put sugarcane in a list of crops the government buys.
- "At least 1.5 times cost" is a floor. Paddy sits on it and wheat sits well above it.
- The cost in the MSP releases is an all-India average, weighted in a way the releases do not state. It counts paid-out costs and puts a value on the family's own unpaid work ('imputed family labour'). Do not call the margin over it a farmer's profit. It says nothing about one farm, one state, or what the crop fetched.
- The releases give national totals only. They cannot tell you which states the grain came from, how many growers sold at MSP, or what the rest were paid. Do not infer them from the MSP.

EXERCISE 1 (retrieval). Name the body that recommends MSPs, the body that fixes them, and the statute that defines MSP and the central pool. Give the section numbers.

Record your confidence as a percentage before turning to the answer.

EXERCISE 2 (interpretation). Here is part of the rabi table from the Press Information Bureau release of 1 October 2025, Rs per quintal, rabi marketing season 2026-27.

crop	MSP	cost of production	margin over cost (%)
Wheat	2585	1239	109
Gram	5875	3699	59
Safflower	6540	4360	50

'Margin over cost' is the release's term: MSP minus cost, as a share of cost. It is not the trader's margin of section 4.

Say what the table shows and what it does not.

EXERCISE 3 (teaching). A journalist has three minutes and asks: "The government raised MSP for 14 crops. Does that mean farmers of all 14 get more?" Answer in plain words, with one quotable sentence.

EXERCISE 4 (critique). A policy note says: "Since sugarcane is covered by MSP, the government buys sugarcane from farmers at a guaranteed price." Find the errors.

10 · How the state moves a price: support price, subsidy, import duty

DEFINITION. A price wedge is a gap that a public decision opens between two prices of the same food. Three wedges are computed here, each by one rule.

The margin of a minimum support price (MSP) over cost is the MSP minus the cost, divided by the cost, times 100. This is the release's "margin over cost". It is not a trader's margin (section 4), which is what is left of a mark-up after handling costs.

The subsidy on grain issued for the public distribution system is the economic cost minus the central issue price. The central issue price is the price at which the Union government issues the grain to the States. Where the issue price is zero, the subsidy equals the economic cost.

The landed price of an import under a duty charged as a percentage of its value is the price before duty times (1 plus the duty rate as a decimal). [129, 130, 131, 132, 133, 134, 135, 136]

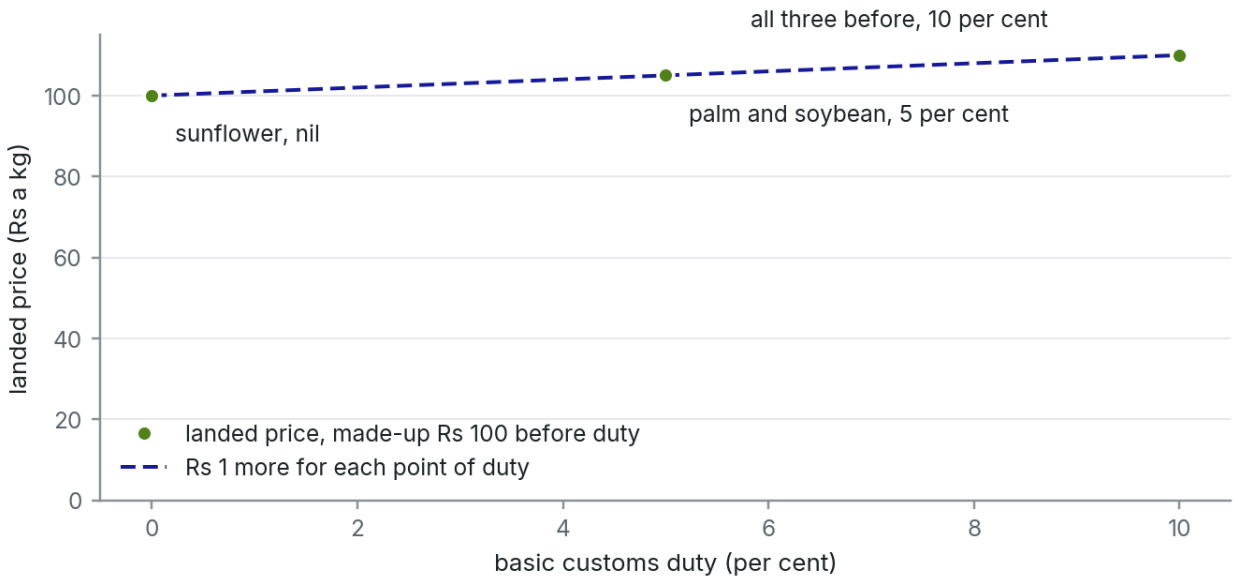
IN PLAIN TERMS. The government changes food prices in three ways that you can work out with a calculator.

First, it sets a minimum support price (MSP) for a crop. The Union government says each MSP is at least one and a half times the cost of growing the crop. That extra half is the margin.

Second, it hands grain to ration-card holders for less than it cost, and since January 2023 for nothing. The gap between the two is the subsidy. The full cost of buying, storing and moving the grain is called the economic cost.

Third, it charges a duty on imports, as a percentage of their value. The price at the port after duty is called the landed price.

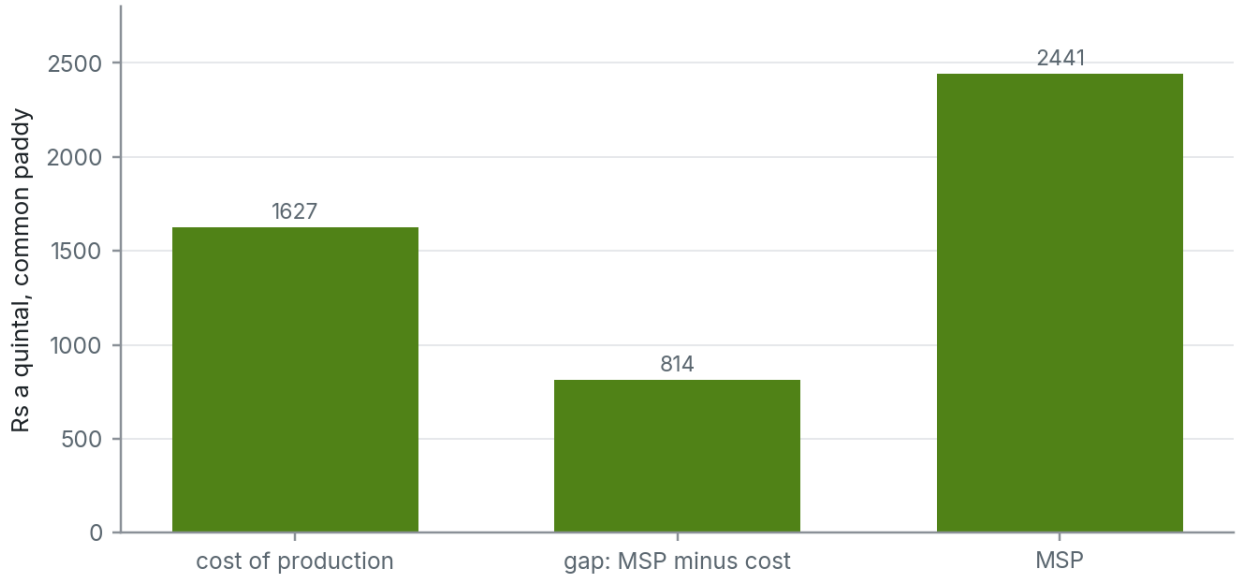
The hard part is the base. Always ask: a percentage of what?



A made-up Rs 100 a kg of crude oil at the port before duty. Its landed price is 100 times (1 plus the duty), so it rises Rs 1 for each point of duty: Rs 110 at 10 per cent, Rs 105 at 5 per cent, Rs 100 at nil. The duties are the ones before and after 24 September 2026.



Rice subsidy as a percentage of its economic cost, for households under the National Food Security Act. It was 91.6 and 91.9 per cent in the bulletin's 2021-22 and 2022-23 rows, at an issue price of Rs 300 a quintal. The bulletin shows 100.0 from its 2023-24 row. Grain became free on 1 January 2023, and the bulletin does not say how it counts the three months of 2022-23 after that.



Common paddy, kharif marketing season 2026-27, in Rs a quintal. The cost is 1627 and the MSP 2441; the gap between them is 814. The same 814 is 50 per cent of the cost and about 33 per cent of the price. The release's "margin over cost" takes the cost as its base.

Illustration 1. Start with the mistake, because it is the one a newspaper reader makes.

Search for the Cabinet's release of 13 May 2026, "Cabinet approves Minimum Support Prices (MSP) for Kharif Crops for Marketing Season 2026-27", on the Press Information Bureau website, and open it. Paddy is on its kharif list (section 9). Find the row for common paddy. It gives an MSP of Rs 2441 per quintal, a cost of Rs 1627 per quintal, and a margin over cost of 50 per cent. A quintal is 100 kg.

Work out the margin the way most people first do. Take the gap and divide it by the price.

```
2441 minus 1627 = 814
814 divided by 2441 = 0.3334698894
0.3334698894 times 100 = 33.34698894
```

About 33 per cent. The release says 50. Your arithmetic is right, and your answer is wrong.

Read the column head again. It says "Margin over cost". The base is the cost, not the price.

```
814 divided by 1627 = 0.500307314
0.500307314 times 100 = 50.0307314
```

Fifty per cent, as printed. The gap is the same Rs 814 in both sums. It is a third of the price and a half of the cost. Book 0, A4, taught you to ask of every percentage: per cent of what?

Now check the rule the release names, "at least 1.5 times" the cost. In words: the price is the cost times one and a half.

```
1627 times 1.5 = 2440.5
```

Round to the rupee and you have the Rs 2441 in the table. “One and a half times cost” and “50 per cent over cost” are one statement, written two ways.

Figures quoted in this illustration are from [126].

WHERE THIS PICTURE BREAKS. The cost in the release is one number for the whole country, a weighted average. It counts the value of the family’s own labour at a rate someone set. A farmer whose own costs run above that average earns less than 50 per cent over them. A farmer who sells below the MSP, because no agency bought the crop, earns less again. The margin describes the announced price and the average cost, and nothing about any one farmer.

Illustration 2. The second wedge sits between what grain costs the government and what a ration-card holder pays for it. The Union government buys the grain, mostly at the MSP, and issues it to the States. The States hand it to households through ration shops.

Search for the Foodgrains Bulletin for December 2025 of the Department of Food and Public Distribution, and open it. Find the statement of economic cost, central issue price and subsidy. Here are its rows for rice under the National Food Security Act (NFSA), in rupees a quintal.

year	economic cost	issue price	subsidy	subsidy as % of economic cost
2021-22	3562.49	300	3262.49	91.6
2022-23	3722.35	300	3422.35	91.9
2023-24	3883.83	0	3883.83	100.0
2024-25, revised estimate	4042.15	0	4042.15	100.0
2025-26, budget estimate	4173.34	0	4173.34	100.0

Check one row yourself. Take the 2022-23 row, which uses an issue price of Rs 300 a quintal, or Rs 3 a kg. That was also what households under the Act paid at the ration shop until 1 January 2023 (Food Ministry, Year End Review 2025). The bulletin does not say how the row counts the three months of 2022-23 after that date.

```
3722.35 minus 300 = 3422.35
3422.35 divided by 3722.35 = 0.9194
0.9194 times 100 = 91.94
```

The bulletin prints 91.9. At that price the household paid about 8 per cent of what the rice cost.

Now take 2025-26. The bulletin’s footnote says the issue price “has become zero” because the grain has been free to everyone under the Act since 1 January 2023.

```
4173.34 minus 0 = 4173.34
4173.34 divided by 100 = 41.7334
```

The subsidy is the whole cost: about Rs 41.73 for every kilogram of rice.

One more step shows where MSP enters. The same bulletin splits that Rs 4173.34 a quintal. Rs 3375.29 of it is the “pooled” cost, the weighted average price paid for the grain at MSP. The rest is the cost of buying, storing and moving it.

```
4173.34 minus 3375.29 = 798.05
3375.29 divided by 4173.34 = 0.8088
```

About 81 per cent of the economic cost is the price paid for the grain. So when an MSP rises, the economic cost rises. With the issue price at zero, all of that rise lands on the subsidy. None of it reaches the ration-card holder's price.

Figures quoted in this illustration are from [127].

WHERE THIS PICTURE BREAKS. These are costs per quintal of rice, which is paddy after milling. Never subtract a paddy MSP from a rice economic cost: the two are prices of different goods, and the arithmetic would run without complaint. The 2025-26 figure is a budget estimate, made before the year's accounts were closed. And the subsidy is what the government spends, not what the rice is worth to the family that receives it.

Illustration 3. The third wedge is at the port. Search for the release of 24 September 2026, "Government Cuts Import Duty on Major Edible Oils to Provide Relief to Consumers", on the Press Information Bureau website. It says the basic customs duty on crude sunflower oil went from 10 per cent to nil. On crude soybean oil and crude palm oil it went from 10 per cent to 5 per cent.

The release gives no world price for the oil, so use a made-up one. Say a kilogram of crude palm oil costs Rs 100 at the port before duty. The rule, in words: the landed price is the price before duty, times one plus the duty written as a decimal. Ten per cent is 0.10.

```
100 times (1 plus 0.10) = 110
100 times (1 plus 0.05) = 105
110 minus 105 = 5
5 divided by 110 = 0.0454545455
```

Here is the trap. The duty was halved, from 10 to 5 per cent. The landed price did not halve. It fell by Rs 5 on Rs 110, which is about 4.5 per cent. The duty fell by 5 percentage points (Book 0, A4); the price fell by 4.5 per cent. Those are different numbers.

For sunflower oil the duty went to nil.

```
100 times (1 plus 0) = 100
110 minus 100 = 10
10 divided by 110 = 0.0909090909
```

About 9 per cent off the landed price, at this made-up world price.

Each duty pushes the landed price up by its own share of the price before duty. Each cut pulls it down by the same share. Whether a shopper's bottle of oil gets cheaper is a separate question. The release itself asks industry "to ensure that the full benefit" is passed on, which tells you it does not happen by itself.

Figures quoted in this illustration are from [77, 76].

WHERE THIS PICTURE BREAKS. The Rs 100 is made up; only the duty rates are real. The rule holds for any price before duty, so the percentages hold too. But the duty here is the basic customs duty alone. The basic duty on these crude oils was 10 per cent from June 2025. A December

2025 government backgrounder says, without a date, that the "effective customs duty" on them was raised to 16.5 per cent. No held text says what makes up the difference. So the landed price above leaves out whatever else is charged at the border.

MUST KNOW POINTS FOR YOU.

- "MSP gives a 50 per cent margin" is true only over cost. The same gap is a third of the price.
- The economic cost of rice was budgeted at Rs 4173.34 a quintal for 2025-26 (Foodgrains Bulletin, December 2025). That is about Rs 41.73 a kg.
- With free grain, a higher MSP does not change what the ration-card holder pays. It raises the economic cost, and so the subsidy.
- A duty cut from 10 to 5 per cent is a fall of 5 percentage points in the duty. It is not a 50 per cent fall in anything a shopper pays.
- Releases on edible oil say "import duty", "basic customs duty" and "effective customs duty". In December 2025 the basic duty on crude oils was 10 per cent. A backgrounder that month says, without a date, that their effective duty was raised to 16.5 per cent. No held text says what makes up the difference, so the landed-price rule here uses basic duty only.
- A paddy MSP and a rice economic cost are prices of different goods. Paddy is milled before it becomes rice. Never subtract one from the other, however neat the answer looks.
- These rules stop at the edge of the government's books: the border, the procurement centre, the ration shop. They cannot tell you the price in an ordinary shop.
- An MSP margin is over an all-India average cost. Do not carry it to a district or a household without saying so.

EXERCISE 1 (critique). A draft policy note says this.

> *Raising the MSP for paddy pushes up the price that poor households pay for rice at the ration shop.*

Say what is wrong with it today, and write the sentence you would put in its place.

EXERCISE 2 (teaching). A health secretary asks for one page, answer first. What does a kilogram of free ration rice cost the Union government? Where does that money go? Write it, with the cost.

PRACTICE. Fourteen problems on this technique, easiest first. Work them on paper before turning to the answers, which are in the appendix at the back under this section's name.

1. A price is 150 and a cost is 100. What is the margin over cost, as a percentage of the cost?

A second cost of 80 is to be raised to one and a half times itself. What is the new price, and what is its margin over cost?

2. A good costs 60 a unit to supply. The buyer pays 15. Find the subsidy per unit, and the subsidy as a percentage of the full cost.

Now the buyer pays nothing. Find the same two numbers.

3. A good costs 200 before duty. Find its price after a duty of 12.5 per cent, and after a duty of nothing at all.

4. Go the other way twice.

A landed price of 230 includes a duty of 15 per cent. What was the price before duty?

A price of 3000 was set at one and a half times cost. What was the cost?

5. The Cabinet's release of 13 May 2026 covers kharif marketing season 2026-27. For moong it gives an MSP of Rs 8780 a quintal and a cost of Rs 5438 a quintal. Work out the margin over cost. Compare your answer with the 61 per cent the release prints.

6. Wheat is on the rabi list (section 9). The Cabinet's release of 1 October 2025 covers rabi marketing season 2026-27. For wheat it gives an MSP of Rs 2585 a quintal and a cost of Rs 1239 a quintal. Work out the margin over cost. Then work out the gap as a percentage of the MSP. Say which one the release prints.

7. The Food Ministry's December 2025 bulletin gives the economic cost of wheat for 2025-26 as Rs 2980.06 a quintal. That is a budget estimate. The issue price to households under the National Food Security Act is zero. A person in a priority household gets 5 kg of grain a month. If all 5 kg were wheat, what would a month's grain cost the government for that person?

8. The same bulletin has a second category, which it calls "tide over": grain issued outside the households under the Act, at Rs 830 a quintal for rice. The held texts do not say who receives it. The economic cost of rice was budgeted at Rs 4173.34 a quintal for 2025-26. Find the subsidy per quintal and per kilogram, and the subsidy as a percentage of the economic cost. Check your percentage against the bulletin's 80.1.

9. Suppose, as a made-up figure, that crude palm oil costs Rs 90 a kilogram at the port before duty. The basic customs duty on it fell from 10 per cent to 5 per cent on 24 September 2026. Work out the landed price before and after, the fall in rupees, and the fall as a percentage of the old landed price.

10. Here is a worked answer. Find the step that broke.

```
bajra MSP, kharif 2026-27: Rs 2900 a quintal
cost: Rs 1858 a quintal
2900 minus 1858 = 1042
1042 divided by 2900 = 0.359
so the margin is 35.9 per cent, below the promised 50
```

11. Here is a worked answer. Find the step that broke.

```
crude palm oil before duty: Rs 100 a kg (made up)
landed at 10 per cent duty: 100 times 1.10 = 110
the duty is halved, to 5 per cent
so the landed price halves: 110 divided by 2 = 55
```

12. A speaker at a meeting says this.

> *Paddy farmers now get a 50 per cent profit, guaranteed. The Cabinet has said so.*

Decide what to compute, compute it, and say what your answer does not establish.

13. A government release of 29 November 2023 says this.

> *As an example, the economic cost of 35 kg rice for an Antyodaya family comes to Rs. 1371*

Antyodaya families are the poorest households, entitled to 35 kg a month. Recompute the figure from the economic cost of rice for 2025-26, budget estimate, Rs 4173.34 a quintal. Then say what your answer does not establish.

14. A news line on 24 September 2026 reads:

> *With the duty on palm oil halved to 5 per cent, cooking oil will be 5 per cent cheaper in shops.*

Decide what to compute, compute it, and say what your answer does not establish.

11 · The National Food Security Act and the public distribution system

Checked against the sources as they stood on 2026-09-24.

DEFINITION. The National Food Security Act, 2013 (Act 20 of 2013) makes a quantity of grain a legal entitlement. Under section 3(1), every person in a priority household is entitled to five kilograms of foodgrains per person per month, at the prices in Schedule I. Households under the Antyodaya Anna Yojana, as many in each State as the Central Government specifies, are entitled instead to thirty-five kilograms per household per month.

Section 2(5) defines foodgrains as rice, wheat or coarse grains, or any mix of them.

Section 3(2) extends the entitlement to up to seventy-five per cent of the rural population and up to fifty per cent of the urban population. Under section 9 the Central Government fixes how many people each State covers. Under section 10 the State Government picks the Antyodaya and priority households within that number.

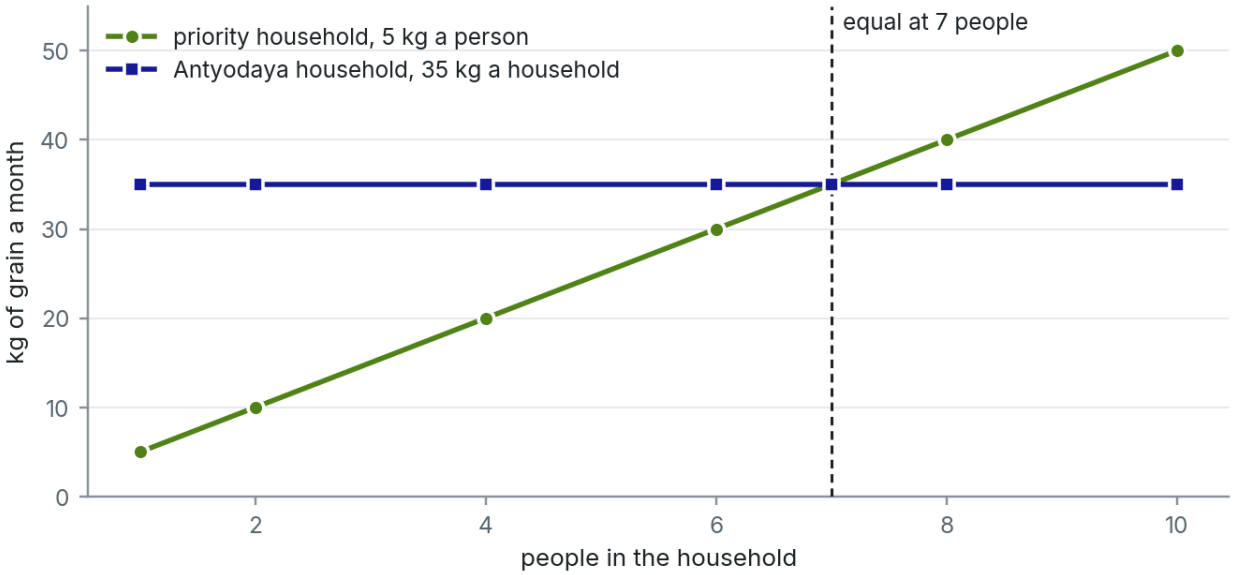
Since 1 January 2023 the grain has been issued free, by decision of the Union government under the Pradhan Mantri Garib Kalyan Anna Yojana. That decision was extended on 29 November 2023 for five years from 1 January 2024. [137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152]

IN PLAIN TERMS. Since 2013, a set quantity of grain each month has been a legal right for up to three-quarters of rural and half of urban Indians. The law is the National Food Security Act (NFSA).

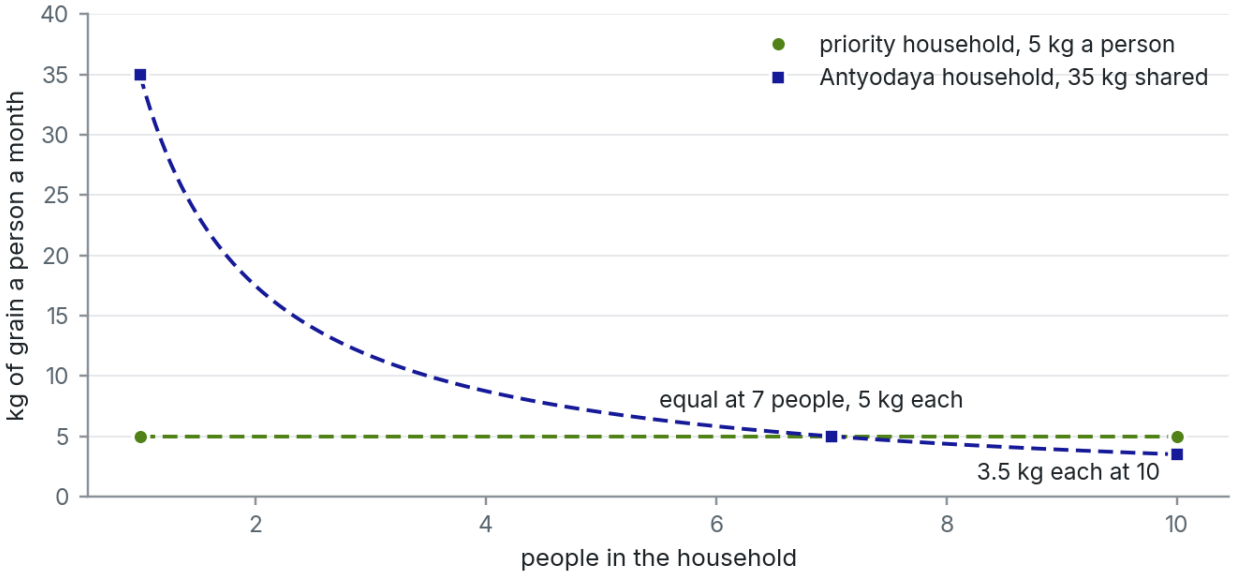
There are two kinds of eligible household. The poorest are Antyodaya households. They get 35 kg of grain a month for the whole household. The rest are priority households. They get 5 kg a month for each person in the household.

The grain comes from a fair price shop, a licensed ration shop.

The Act set a price of at most Rs 3 a kg for rice. Since January 2023 the grain has been free. That came from a Union government decision, not from a change in the Act.



Grain a month under section 3(1) of the National Food Security Act, 2013. A priority household gets 5 kg for each person; an Antyodaya household gets 35 kg whatever its size. The two are equal at 7 people, and above that the priority household gets more.



The same rule per person. Every member of a priority household gets 5 kg a month, whatever its size. An Antyodaya household's 35 kg is shared, so each member's grain is 35 divided by the number of people. It falls to 5 kg at 7 people and to 3.5 kg each at 10.

Illustration 1. Start with the figure everyone quotes, 5 kg a person, because it is half the rule.

Search for the National Food Security Act, 2013 on the India Code website and open it. Read section 3(1). A person in a priority household gets "five kilograms of foodgrains per person per month". Keep reading into the proviso. An Antyodaya household gets "thirty-five kilograms of foodgrains per household per month". One is per person, the other per household. Book 0, A5, warned that Indian entitlements change their denominator without warning. Here is one.

Work out both for households of different sizes, in kilograms a month.

people in the household	priority household	Antyodaya household
1	5	35
2	10	35
4	20	35
6	30	35
7	35	35
8	40	35
10	50	35

The two are equal where 5 kg times the number of people reaches 35 kg.

```
35 divided by 5 = 7
```

At seven people the two rules give the same grain. Above seven, a priority household gets more than an Antyodaya one, though Antyodaya households are the poorest. Per person, a ten-person Antyodaya household gets:

```
35 divided by 10 = 3.5
```

That is 3.5 kg each, against 5 kg each in a priority household of any size. Never quote "5 kg a person" for the Act as a whole. Say which kind of household you mean.

Figures quoted in this illustration are from [153].

WHERE THIS PICTURE BREAKS. The table shows what the Act entitles, not what arrives. A State may issue rice, wheat or coarse grains in any mix. A shop may run short, and section 8 then entitles the household to a food security allowance instead. And a household's size on its ration card may differ from the number of people who eat there.

Illustration 2. Now the price. Here the trap is the word "free".

In the same Act, open Schedule I. It sets the price "not exceeding rupees 3 per kg for rice, rupees 2 per kg for wheat and rupee 1 per kg for coarse grains". That held for three years from the Act's start. After that, the Schedule lets the Central Government fix any price up to the minimum support price (MSP), or for rice the derived MSP. The Act allows zero, but does not require it.

Next, search the Press Information Bureau website for release 1980689 of 29 November 2023, "Free Foodgrains for 81.35 crore beneficiaries for five years: Cabinet Decision". The Cabinet decided to give free grain to about 81.35 crore people, that is 813.5 million, for five years from 1 January 2024. The Food Ministry's year-end review of 2025 adds that free grain began a year earlier, on 1 January 2023, under the Pradhan Mantri Garib Kalyan Anna Yojana.

Now put the two instruments side by side, as Book 0, F5, taught.

what	rests on	who can change it
5 kg a person, 35 kg an Antyodaya household	the Act, section 3	Parliament

what	rests on	who can change it
a price of at most Rs 3, 2 and 1 a kg, then at most the MSP (derived MSP for rice)	the Act, Schedule I	the Central Government, within the Schedule, or by amending it under section 37
a price of zero, for five years from 1 January 2024	a Cabinet decision	the Cabinet

Five years from 1 January 2024 runs to the end of 2028. The quantity is a right in law. The zero price is a decision with an end date. Before that date, look for the decision that replaces it.

Figures quoted in this illustration are from [154, 127, 153].

WHERE THIS PICTURE BREAKS. The table says who can change each line, not who will. A zero price that has run for years is hard to withdraw, whatever its legal footing. What the table does fix is where to look when it changes: a Cabinet decision, not an amendment in the Gazette.

MUST KNOW POINTS FOR YOU.

- "Five kilograms a person" is the priority-household rule only. Say which household you mean whenever you quote the entitlement.
- About 81.35 crore people, that is 813.5 million, are to get free grain for five years from 1 January 2024. That was the Cabinet decision of 29 November 2023.
- The quantity is a legal right. The zero price is not. The Act caps the price; the Cabinet made it zero, to the end of 2028.
- The Act's grain is cereal only: rice, wheat or coarse grains. Pulses, oil and vegetables are not in section 3 at all.
- The Food Ministry itself calls the public distribution system "supplemental". Never work out a household's diet from its ration alone.
- Seventy-five per cent rural and fifty per cent urban are national ceilings, "up to". They are not the share covered in any one State.
- If the grain does not come, section 8 entitles the household to a food security allowance from the State.

EXERCISE 1 (retrieval). Without looking back, write down five things.

1. The Act and the section that make grain a right.
2. The two kinds of eligible household, and what each gets.
3. What counts as grain.
4. Who picks the households.
5. What makes the grain free today.

Record your confidence as a percentage before turning to the answer.

EXERCISE 2 (interpretation). A State announces: "From next month, every ration card will also get 1 kg of pulses free." A colleague writes that the National Food Security Act has been widened to cover pulses. List what you would check before agreeing, and say what you expect to find.

EXERCISE 3 (teaching). A journalist has three minutes. The question: "Is free ration grain now a legal right in India?" Answer without jargon. Give one quotable sentence, and say how sure you are.

12 · School meals and anganwadi food

Checked against the sources as they stood on 2026-09-24.

DEFINITION. The National Food Security Act, 2013 gives meals as well as grain, each free of charge and each "so as to meet the nutritional standards specified in Schedule II".

Section 4(a) entitles every pregnant woman and lactating mother to a meal during pregnancy and for six months after the birth, through the local anganwadi. Section 5(1)(a) entitles every child from six months to six years to an age-appropriate meal through the anganwadi. Section 5(1)(b) entitles every child up to class VIII, or aged six to fourteen, to one mid-day meal on every school day, in schools run by local bodies or the government, or aided by it. Section 6 adds meals for children who suffer from malnutrition.

Section 7 has the States run these schemes under Central guidelines, "including cost sharing".

Schedule II sets the standard for each group as energy in kilocalories and protein in grams.

group	type of meal	energy (kcal)	protein (g)
children, 6 months to 3 years	take-home ration	500	12-15
children, 3 to 6 years	morning snack and hot cooked meal	500	12-15
children, 6 months to 6 years, who are malnourished	take-home ration	800	20-25
lower primary classes	hot cooked meal	450	12
upper primary classes	hot cooked meal	700	20
pregnant women and lactating mothers	take-home ration	600	18-20

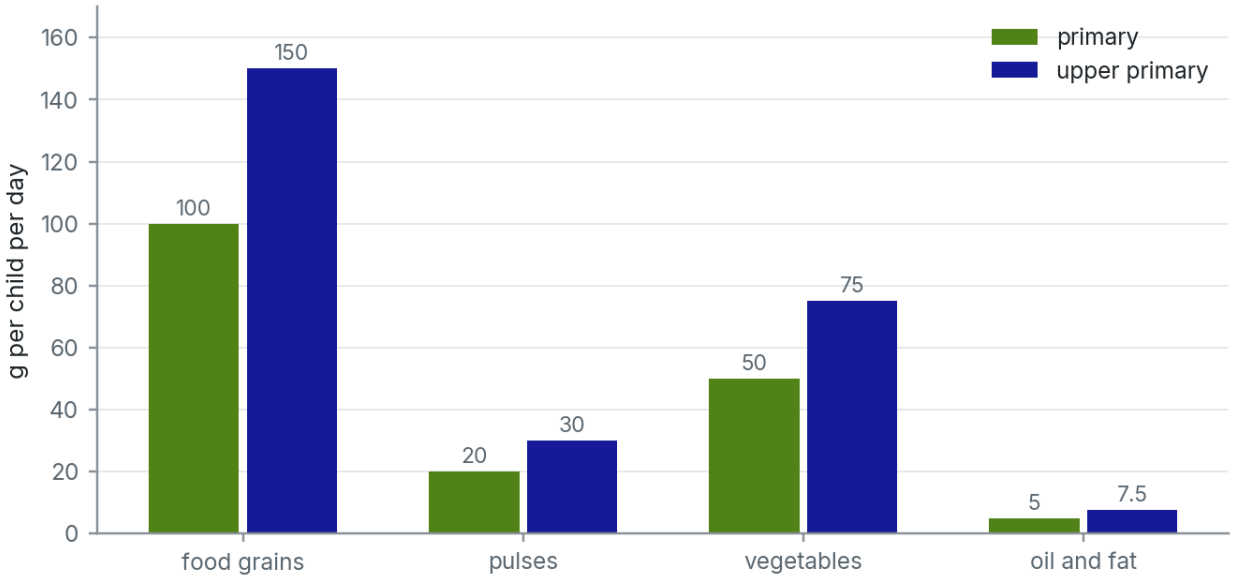
Two Union schemes deliver meals of these kinds. Pradhan Mantri Poshan Shakti Nirman (PM POSHAN), earlier the Mid-Day Meal Scheme, is run by the Ministry of Education.

Saksham Anganwadi and Poshan 2.0 is run by the Ministry of Women and Child Development. Its guidelines of 2022 issue under sections 4(a), 5(1)(a), 6 and 7 of the Act. [155, 156, 157, 158, 159, 160, 144, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 173, 173, 174, 175]

IN PLAIN TERMS. A pregnant woman gets a meal through her local anganwadi. So does a mother for six months after the birth. An anganwadi is a government child care centre. Every child from six months to six years gets a meal there too.

PM POSHAN runs the school meal. Saksham Anganwadi and Poshan 2.0 runs the anganwadi food. Some groups get a hot cooked meal (HCM) at the centre. Others get a take-home ration (THR): a prepared food handed out to be eaten at home.

The Act sets each meal's size in two numbers only: energy, in kilocalories, and protein, in grams. Each is an amount the meal must reach. Nothing in the Act sets an upper limit on energy, sugar, fat or salt.



PM POSHAN's food norms per child per day, in grams, as PIB 1812421 states them. Grain is the heaviest item for both classes, 100 g in primary and 150 g in upper primary. Every bar is an amount to provide. Salt has no number, only as per need, no row sets a ceiling, and sugar is not on the list at all.

Illustration 1. Start with a dead end this book met while it was being written.

Search for the Saksham Anganwadi and Poshan 2.0 Scheme Guidelines of 2022 on the website of the Ministry of Women and Child Development, and open them. Go to 3.2.1, Nutritional Norms. Children from 6 to 72 months get 500 kilocalories and 12 to 15 g of protein a day. That matches Schedule II of the Act. Now read the line under the table: "The Nutritional Norms are under revision and will be notified shortly."

So search the Press Information Bureau website for its backgrounder of 14 April 2026, "Mission Poshan 2.0: Strengthening India's Nutrition Ecosystem". It says the supplementary-nutrition norms of Schedule II, for anganwadi beneficiaries, "have been revised in January 2023". It says the old ones were "largely calorie-specific". It does not give the new numbers. Neither does anything else this book could obtain.

Here is what you can say, and it is enough. Schedule II, as printed, sets 500 kilocalories for a young child at the anganwadi. The government says those norms were revised in January 2023, and the revised figures are not in the documents at hand. Quote the old figure with that sentence attached, or not at all.

Now read the one table you do hold, Schedule II, for a different thing: the type of meal. Book 0, F2, drew its energy column. Read the column beside it.

who	what they get	where they eat it
children, 6 months to 3 years	take-home ration	at home
children, 3 to 6 years	morning snack and hot cooked meal	at the anganwadi

who	what they get	where they eat it
children, 6 months to 6 years, malnourished	take-home ration	at home
pregnant women and lactating mothers	take-home ration	at home
lower and upper primary classes	hot cooked meal	at school

The 2022 guidelines add that a take-home ration "shall not be given in the form of raw ration (Wheat, Rice, Dal etc.)". So a take-home ration is a prepared food, a product the State makes or buys. The hot cooked meal is cooked on the day. Those are two different food chains, run by the same scheme.

Figures quoted in this illustration are from [153, 176, 177].

WHERE THIS PICTURE BREAKS. The table is the rule as the Act and the 2022 guidelines set it. States may give a hot cooked meal in place of a take-home ration, which the guidelines allow, so a given State may differ. And a take-home ration is eaten at home. Who in the household eats it is not something any of these documents can tell you.

Illustration 2. Now the school meal. Search the Press Information Bureau website for release 1812421 of 1 April 2022, titled "PM POSHAN". It is a minister's written reply in the Lok Sabha. It carries the scheme's norms per child per day.

item	primary	upper primary
energy (kcal)	450	700
protein (g)	12	20
food grains (g)	100	150
pulses (g)	20	30
vegetables (g)	50	75
oil and fat (g)	5	7.5
salt and condiments	as per need	as per need

The first two rows match Schedule II exactly. The rest is new. They are the food, by weight, that a school is to buy and cook to reach those two numbers.

Read the table for what kind of rule each row is. Every number is an amount to provide. Grain is the heaviest item on the list. Salt has no number at all, only "as per need". No row sets a ceiling. Nothing caps the energy or limits the fat, and nothing mentions sugar.

Compare the anganwadi guidelines of 2022. They say "Only jaggery should be used for sweetening; white sugar should not be used." So one scheme names a sweetener rule and the other names none.

Figures quoted in this illustration are from [178].

WHERE THIS PICTURE BREAKS. This is the table as a 2022 reply in Parliament states it. The Ministry of Education's own guidelines of 2023 could not be obtained for this book, and they may

add detail, such as menu rules, that this table leaves out. The scheme was approved for 2021-22 to 2025-26. Whether and on what terms it runs beyond that is not in the documents held.

MUST KNOW POINTS FOR YOU.

- "Anganwadi children get 500 kilocalories" is the old norm. A government backgrounder of April 2026 says Schedule II's supplementary-nutrition norms "have been revised in January 2023". They cover children from 6 months to 6 years, pregnant women, lactating mothers and adolescent girls. The backgrounder gives no new figures. It says nothing of the school-meal rows. The Act lets the Central Government amend a Schedule by notification (section 37). No such notification is held.
- Every number in Schedule II and in the PM POSHAN norms table is an amount to reach. None is a ceiling. The only rule on sugar in the documents held is the anganwadi guidelines' ban on white sugar. It limits the kind of sweetener, not the amount.
- The anganwadi guidelines say their own programme was "driven by calorie intake rather than on balanced diets".
- A take-home ration is a prepared food, not grain. The 2022 guidelines forbid raw rice, wheat or dal as a take-home ration. Grain still goes in, as an ingredient of the prepared food (3.4).
- Under the 2022 guidelines, pregnant women and lactating mothers, children from 6 to 36 months, children with severe acute malnutrition, and adolescent girls aged 14 to 18 where covered get a take-home ration. Schedule II's row says only "malnourished". Children from three to six get a morning snack and a hot cooked meal at the centre.
- Centre and States share the anganwadi food bill. The 2022 guidelines set the Centre's share of supplementary nutrition at 50 per cent in States with a legislature. It is 90 per cent in the north-eastern and Himalayan States, and all of it in Union territories without a legislature. No document held gives PM POSHAN's split. Do not guess it.
- Both schemes were approved for 2021-22 to 2025-26. Before you describe either scheme as it is today, find the current approval.

EXERCISE 1 (retrieval). Take each person below. Name the section of the National Food Security Act that entitles them. Name the scheme that delivers it. Say whether they get a take-home ration or a hot cooked meal.

1. A child of two.
2. A child of four.
3. A child in upper primary at a government school.
4. A woman five months pregnant.

Record your confidence as a percentage before turning to the answer.

EXERCISE 2 (critique). A district officer says this in a review meeting.

> *Our school meals are legally required to supply 450 kilocalories. Several schools serve more, so they are in breach of the Act.*

Say what is wrong, and what the officer would need before any school could be in breach.

EXERCISE 3 (teaching). Explain to a first-year resident, in ten minutes with a whiteboard, where the food a four-year-old eats at an anganwadi comes from in law. Draw the chain from Parliament to the plate.

13 · What a ration, a meal or a take-home ration provides

DEFINITION. A food entitlement is stated as a mass of food, over a period, for a unit of people. An Antyodaya household is entitled to thirty-five kilograms a month for the whole household. What an entitlement provides is the energy and protein in that food, per person per day.

Getting from one to the other is a chain of unit conversions. First put the entitlement into grams per person per day. Divide a monthly amount by the number of days you take the month to have. Divide a household amount by the number of people in the household. Then multiply the grams by the food's energy and protein per 100 grams, and divide by 100. For a meal of several foods, work out each one and add them.

The contents per 100 grams come from a food composition table. India's is the Indian Food Composition Tables 2017 (IFCT) of the Indian Council of Medical Research's National Institute of Nutrition (ICMR-NIN). IFCT prints energy in kilojoules only. The figures are physiologically available energy, worked out by the Atwater system. IFCT converts them to kilocalories with 1 kcal = 4.18 kJ. This factor and Book 0's 4.184 differ by less than 0.1 per cent (4.184 divided by 4.18 is 1.00096). The gap never changes a verdict against a norm.

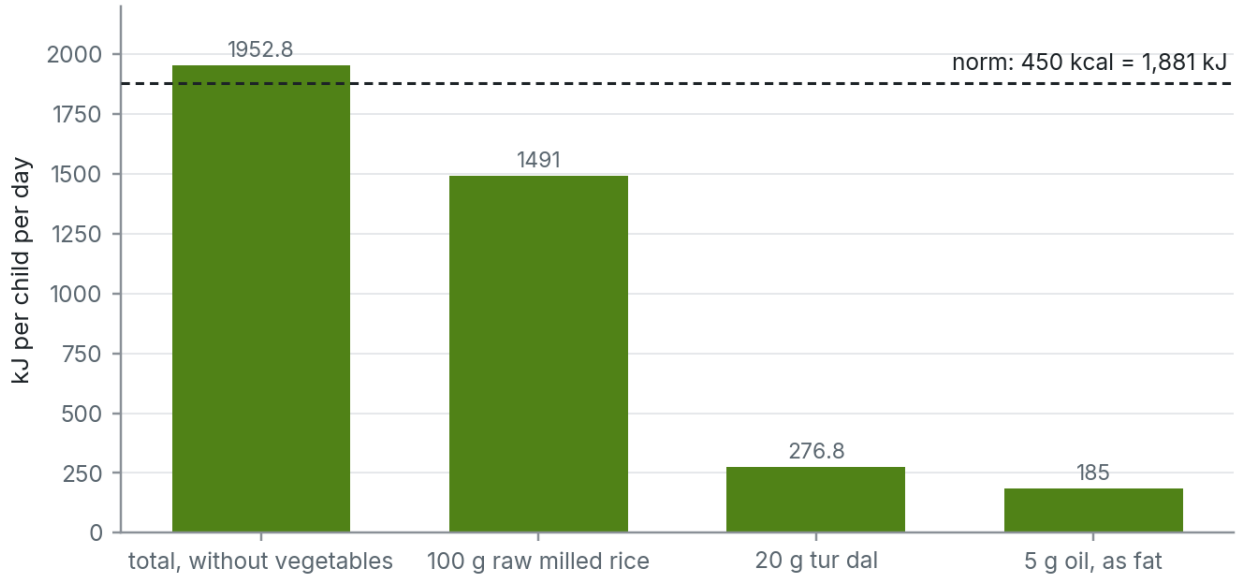
ICMR-NIN's 2020 adult requirement is 1660 kcal a day for a woman of 55 kg doing sedentary work (a physical activity ratio of 1.40). For a man of 65 kg it is 2110 kcal. The 55 and 65 kg are the body weights the table assumes. This section calls these two the reference woman and man.

The arithmetic gives the energy in the food handed over. It does not give the energy any person eats. [179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207]

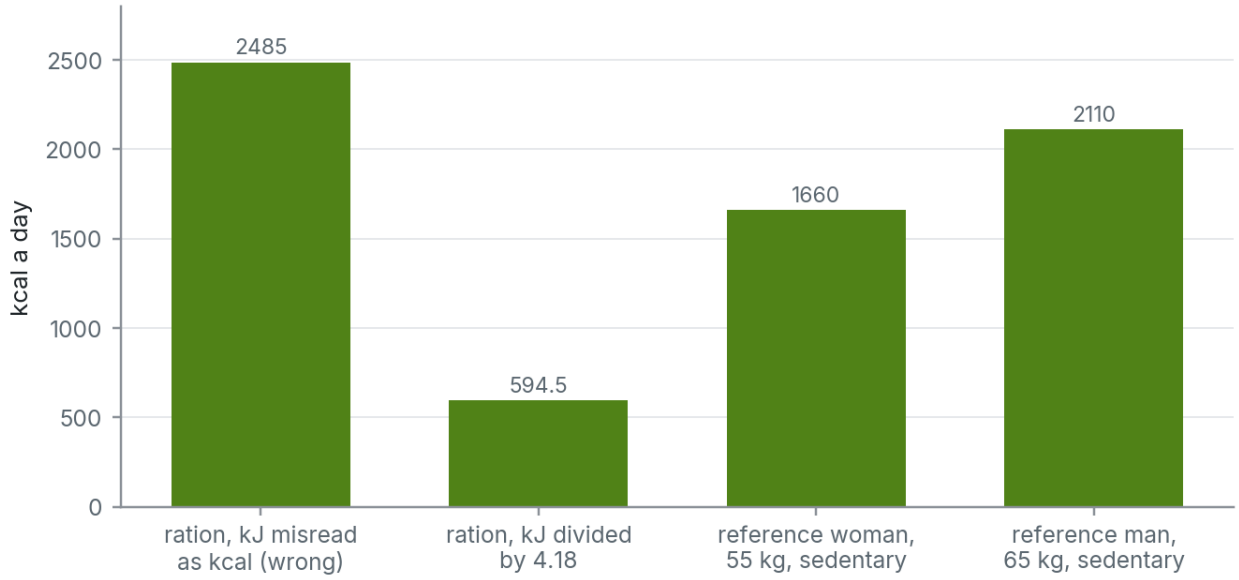
IN PLAIN TERMS. A ration is written as a weight of food. What you usually want to know is how much energy and protein that is, for one person, on one day.

One trap sits in the tables. They give energy in kilojoules, not kilocalories.

The answer is the energy in the food handed over. It is not what anybody ate.



A primary school meal built to the PM POSHAN food norms, in kilojoules. The 100 g of raw milled rice gives 1,491, the 20 g of tur dal 276.8, and the 5 g of oil at most 185. The 50 g of vegetables is not counted. The total, 1,952.8, is already above the norm of 450 kcal, which is 1,881 kJ. About three quarters of it is the rice.



Five kg of raw milled rice a month, as energy a day. Read the table's kJ as kcal and the ration seems to give 2,485 kcal, more than the reference man's 2,110. Divided by 4.18 it is 594.5 kcal: about 36 per cent of the reference woman's 1,660 and 28 per cent of the man's 2,110.

Illustration 1. Start with the mistake, because the table sets it for you.

A person in a priority household is entitled to five kilograms of grain a month, under section 3(1) of the National Food Security Act, 2013. The Act says foodgrains: rice, wheat or coarse grains. Take the grain as raw milled rice. That is a choice, and you will see what it costs below.

Open the Indian Food Composition Tables 2017 at https://www.nin.res.in/ebooks/IFCT2017.pdf and go to Table 1. Find row A015, Rice, raw, milled.

> *A015 Rice, raw, milled (Oryza sativa) 6 9.93±0.75 7.94±0.58 0.56±0.08 0.52±0.05 2.81±0.42 1.99±0.39 0.82±0.22 78.24±1.07 1491±15*

The last number is the energy in 100 g of rice: 1491. The second after the name is the protein: 7.94 g. Take 1491 as kilocalories and work out a day.

```
5,000 times 1,491 divided by 100 = 74,550
74,550 divided by 30 = 2,485
```

That says 2,485 kilocalories a day from the ration alone. A sedentary man's requirement, set by ICMR-NIN in 2020 for a reference man of 65 kg, is 2,110. So the ration would feed a grown man completely, with some left over. Something has gone wrong, and it is not the arithmetic.

Go back to the head of the table and read the unit over the last column. It says KJ. The table prints energy in kilojoules and nothing else.

Do it again properly. The tables give their own factor in section 3.6: 1 kcal = 4.18 kJ. Use that one, since it is the one the table's own numbers were made with.

```
5,000 times 1,491 divided by 100 = 74,550
74,550 divided by 30 = 2,485
2,485 divided by 4.18 = 594.5
```

About 595 kilocalories a day. The first line is kilojoules for the month. The second takes a month to be 30 days, which is a choice you must say out loud. The third turns the day's kilojoules into kilocalories.

Now the protein, the same way.

```
5,000 times 7.94 divided by 100 = 397
397 divided by 30 is about 13.2
```

About 13 grams of protein a day.

Set the energy against a requirement. ICMR-NIN's 2020 figure for a sedentary reference woman of 55 kg is 1,660 kilocalories a day. Divide.

```
594.5 divided by 1,660 = 0.358
594.5 divided by 2,110 = 0.282
```

About 36 per cent of the reference woman's day, and 28 per cent of the reference man's.

Last, the factor. With Book 0's 4.184 instead, the energy is 2,485 divided by 4.184, which is 593.9 kilocalories. The two answers part in the fourth digit. Neither is wrong. Mixing them in one sum is.

Figures quoted in this illustration are from [153, 208, 209].

WHERE THIS PICTURE BREAKS. The 594.5 kilocalories holds for raw milled rice at the tables' average, for a month taken as 30 days, for the person the grain is issued to. Parboiled milled rice

(row A014) is 1471 kJ per 100 g, and a 31-day month gives less per day. The table's 1491 carries a spread of 15 across its six regions, so the answer has three trustworthy digits, not four.

The shares hold only against ICMR-NIN's reference woman and man. A priority household's entitlement covers every member, children included, and the section gives no child's requirement. And the Department of Food and Public Distribution says in its own annual report that the public distribution system (PDS) is supplemental, not meant to meet a household's whole requirement.

Illustration 2. Now a meal. The same move runs on each food, and then the foods are added.

PM POSHAN sets food norms for each child per day. A Press Information Bureau (PIB) release of 1 April 2022 gives them for a primary school child: 100 g of foodgrains, 20 g of pulses, 50 g of vegetables and 5 g of oil and fat. The release does not say whether these are raw weights; this sum takes them as raw, the grain as issued. The energy and protein norms in the same table are 450 kilocalories and 12 g, the same as Schedule II of the Act. The release does not say which classes are primary; the Schedule calls them lower and upper primary classes.

Take the grain as raw milled rice again, and the pulse as tur dal, which the tables call red gram dal (row B021): 21.70 g protein and 1384 kJ per 100 g. The tables' Table 4 gives fat 37 kJ a gram. Count the oil as if it were all fat. That can only overstate its energy, never understate it. Leave the vegetables out: the tables' vegetable rows are not used here, so the total you get is short by whatever the 50 g of vegetables holds.

Food	Grams per child per day	kJ per 100 g	Protein, g per 100 g	kJ in the meal	Protein in the meal, g
raw milled rice	100	1491	7.94	1491	7.94
tur dal	20	1384	21.70	276.8	4.34
oil, counted as fat	5	3700	0	185	0
vegetables	50	not counted	not counted		
total, without vegetables				1952.8	12.28

The oil's 3700 is the fat factor of 37 kJ a gram written per 100 g. Each line of the last two columns is grams times the content, divided by 100.

```
100 times 1,491 divided by 100 = 1,491
20 times 1,384 divided by 100 = 276.8
5 times 37 = 185
1,491 plus 276.8 plus 185 = 1,952.8
1,952.8 divided by 4.18 = 467.2
```

```
100 times 7.94 divided by 100 = 7.94
20 times 21.70 divided by 100 = 4.34
7.94 plus 4.34 = 12.28
```

About 467 kilocalories and 12.3 g of protein, against a norm of 450 and 12. In kilojoules the energy norm is 450 times 4.18, which is 1,881. On paper the meal meets both norms before the vegetables are counted.

Now ask where the energy comes from. Divide the rice's share by the whole.

```
1,491 divided by 1,952.8 = 0.764
7.94 divided by 12.28 = 0.647
```

About three quarters of the meal's energy, and about two thirds of its protein, is the cereal. The norms fix how much energy and protein a meal holds. They say nothing about where it comes from.

Figures quoted in this illustration are from [178, 208].

WHERE THIS PICTURE BREAKS. The totals hold for raw milled rice, tur dal and oil at the tables' averages, with the vegetables left out. Another grain or pulse gives other totals: problems 5 and 6 below swap the grain. The meal on paper is not the meal on the plate, which depends on the recipe, the cooking and whether the child eats it.

Illustration 3. A take-home ration (THR) runs the other way. It is not raw grain: the Poshan 2.0 guidelines of 2022 say, at 3.6, that THR "shall not be given in the form of raw ration". So there is no row in the tables to look up. What you have is the norm, and the sum goes from the norm to the packet.

Schedule II of the Act sets a THR for a child of 6 months to 3 years at 500 kilocalories and 12 to 15 g of protein a day. The guidelines, at 3.3, say supplementary nutrition is served on at least 300 days a year, on average 25 days a month. At 3.7 they say THR is handed out twice a month.

```
500 times 25 = 12,500
12,500 divided by 2 = 6,250
6,250 times 4.18 = 26,125
```

A month's THR for one child should carry 12,500 kilocalories. Each of the two hand-outs should carry 6,250 kilocalories, which is 26,125 kilojoules. To check a packet, read the manufacturer's energy per 100 g and ask how many grams make 6,250 kilocalories. The guidelines ask each State to publish the calorie and protein content of every THR product on its website, which is where you find it.

One warning about the norm itself. The 2022 guidelines print this table with a note that the norms are "under revision". The anganwadi supplementary-nutrition norms in Schedule II (take-home ration and hot cooked meal) were revised in January 2023, a PIB backgrounder of 14 April 2026 says; the revised figures are not held. Nothing held says the school-meal rows were revised. The 500 here is the older norm.

Figures quoted in this illustration are from [153, 176].

WHERE THIS PICTURE BREAKS. The arithmetic assumes 25 days a month and two equal hand-outs, and it uses the pre-2023 norm. It gives what the packet should carry, not what the child

eats. A packet taken home may be shared with whoever else is at home, and nothing in this sum can see that.

MUST KNOW POINTS FOR YOU.

- The Indian Food Composition Tables give energy in kilojoules only. Read the unit over the column before you read the number under it.
- The priority-household entitlement is five kilograms of grain a month. As raw milled rice, it holds about 595 kilocalories and 13 g of protein a day for the person it is issued to. That uses the 2017 tables' average across six regions and a 30-day month. Quote it with both.
- The Indian tables use 4.18, not Book 0's 4.184. Say which one you used, and never use both in one calculation, or a difference in the fourth digit will look like a finding.
- An Antyodaya entitlement is 35 kg for the whole household. What it gives one person depends on how many people share it, which the Act does not fix. Never quote a per-person figure for it without the household size you assumed.
- "The ration supplies a third of a person's energy" compares the ration with a reference 55 kg sedentary woman. So say whose requirement you divided by, or do not give the share.
- The Department of Food and Public Distribution itself calls the ration supplemental. So never present a ration's energy as a person's intake.
- A primary school meal built to the PM POSHAN food norms meets the 450 kcal and 12 g norms on paper. About three quarters of its energy is cereal. The norms fix the amounts. They do not fix where the energy comes from.
- The anganwadi supplementary-nutrition norms in Schedule II (take-home ration and hot cooked meal) were revised in January 2023, a PIB backgrounder of 14 April 2026 says; the revised figures are not held. Nothing held says the school-meal rows were revised. Any THR sum built on 500 or 600 kilocalories uses the older norm, and must say so.

EXERCISE 1 (teaching). A health secretary has one page and asks you what the free PDS ration gives a person in a priority household, in energy and protein. Answer first. Then say what the figure does not tell her, in a way she can repeat in a meeting.

PRACTICE. Twelve problems on this technique, easiest first. Work them on paper before turning to the answers, which are in the appendix at the back under this section's name.

1. A food holds 1,400 kJ in every 100 g. How many kilojoules are in 250 g of it? And in 35 g?

2. Using 1 kcal = 4.18 kJ, turn 2,090 kJ into kilocalories. Then turn 450 kcal into kilojoules.

3. A household receives 7 kg of grain a month. Taking a month as 30 days, how many grams is that a day? If four people share it equally, how many grams a day is that for each?

4. A priority household member takes the 5 kg a month entitlement as whole wheat. The Indian Food Composition Tables 2017 give whole wheat 1347 kJ and 10.59 g of protein per 100 g. Taking a

month as 30 days, how much energy, in kilocalories, and how much protein does the entitlement hold a day? Use the tables' own factor.

5. The PM POSHAN food norms give an upper primary child 150 g of foodgrains a day. They add 30 g of pulses, 75 g of vegetables and 7.5 g of oil and fat. The nutrition norms are 700 kcal and 20 g of protein.

Build the meal from three foods and leave the vegetables out. Raw milled rice has 1491 kJ and 7.94 g protein per 100 g. Tur dal has 1384 kJ and 21.70 g per 100 g. Count the oil as fat, at 37 kJ a gram. Does the meal meet each norm?

6. Build the same upper primary meal again, with whole wheat in place of the rice. Whole wheat has 1347 kJ and 10.59 g of protein per 100 g. Keep the rest: 30 g of tur dal, 7.5 g of oil counted as fat, no vegetables. What happens to the energy and the protein?

7. Schedule II of the National Food Security Act, 2013 sets a take-home ration for pregnant women and new mothers. It is 600 kcal a day. The Poshan 2.0 guidelines say the food is served on 25 days a month, on average. The ration is handed out twice a month. How many kilocalories should each hand-out carry? How many kilojoules is that, with the Indian tables' factor? Say which version of the norm you used.

8. An Antyodaya household takes its 35 kg a month entitlement as raw milled rice (1491 kJ per 100 g). Work out the energy per person per day, in kilocalories, for a household of seven and for a household of three. The two household sizes are made up for the problem. Take a month as 30 days.

9. Here is a worked answer. Find the step that broke.

```
entitlement: 5 kg of raw milled rice a month
rice: 1,491 kJ per 100 g
5 times 1,491 = 7,455 kJ a month
7,455 divided by 30 = 248.5 kJ a day
248.5 divided by 4.18 = 59.4 kcal a day
```

"So the ration gives under 60 kcal a day, which is next to nothing."

10. Here is a worked answer. Find the step that broke.

```
Antyodaya entitlement: 35 kg of raw milled rice a month
35,000 divided by 30 = 1,166.7 g a day
1,166.7 times 1,491 divided by 100 = 17,395.5 kJ a day
17,395.5 divided by 4.18 = 4,161.6 kcal a day
```

"So each Antyodaya beneficiary gets about 4,160 kcal a day, nearly twice a sedentary man's requirement of 2,110. The ration is too generous."

11. A briefing note says this.

> *The free PDS ration meets more than a third of every beneficiary's daily energy needs.*

Decide what to compute, compute it, and say what your answer does not establish.

12. In a meeting somebody says this.

> *If the PDS gave bajra instead of rice, poor households would get fewer calories, and that would help with obesity.*

Bajra is 1456 kJ and 10.96 g of protein per 100 g in the Indian Food Composition Tables 2017. Decide what to compute, compute it, and say what your answer does not establish.

14 · The state as a food provider

Checked against the sources as they stood on 2026-09-25.

DEFINITION. The Indian state does not only regulate food. Through three channels it also buys, stores, cooks and hands out food, to a large share of the population.

The first is the public distribution system (PDS) under the National Food Security Act, 2013 (NFSA). On 29 November 2023 the Union Cabinet decided to give free foodgrains to about 81.35 crore (813.5 million) beneficiaries under the Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY) for five years from 1 January 2024. The Department of Food and Public Distribution (DFPD) allocates the grain, and it goes out through 5.51 lakh (551,000) fair price shops.

The second is PM POSHAN (Pradhan Mantri Poshan Shakti Nirman), the Ministry of Education's school meal scheme, earlier called the mid-day meal. It was approved for 2021-22 to 2025-26. The DFPD allocated it 22.31 lakh tonnes of foodgrains for 2025-26.

The third is supplementary nutrition at anganwadi centres, under Mission Saksham Anganwadi and Poshan 2.0, approved for 2021-22 to 2025-26. Its grain comes through the Wheat Based Nutrition Programme (WBNP), which the Ministry of Women and Child Development runs for children up to 6 and for expectant and lactating women. The grain is an ingredient of the cooked meal and the take-home ration, not handed out raw. As on March 2026 the mission's tracking system followed nearly 14,03,170 (about 1.4 million) anganwadi centres and about 8,95,29,425 (about 89.5 million) eligible beneficiaries.

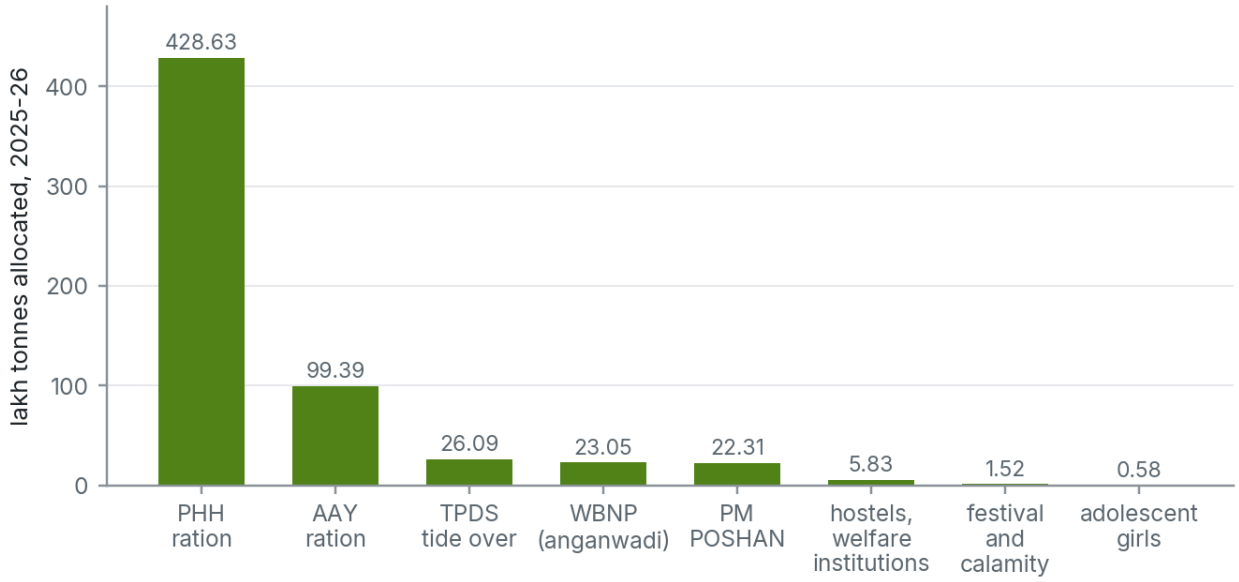
In each channel the state decides which foods go in: which grain, which recipe, what may and may not be added. Each such decision changes what very many people eat. So what the state buys and serves is nutrition policy, whether or not it is called that. Hostels and welfare institutions are the same lever: the DFPD allocated them 5.83 lakh tonnes for 2025-26. [210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 231, 232, 233, 234, 235]

IN PLAIN TERMS. The earlier sections showed what each scheme promises one person: a ration, a school meal, an anganwadi meal or packet. This one steps back and asks how big the whole thing is.

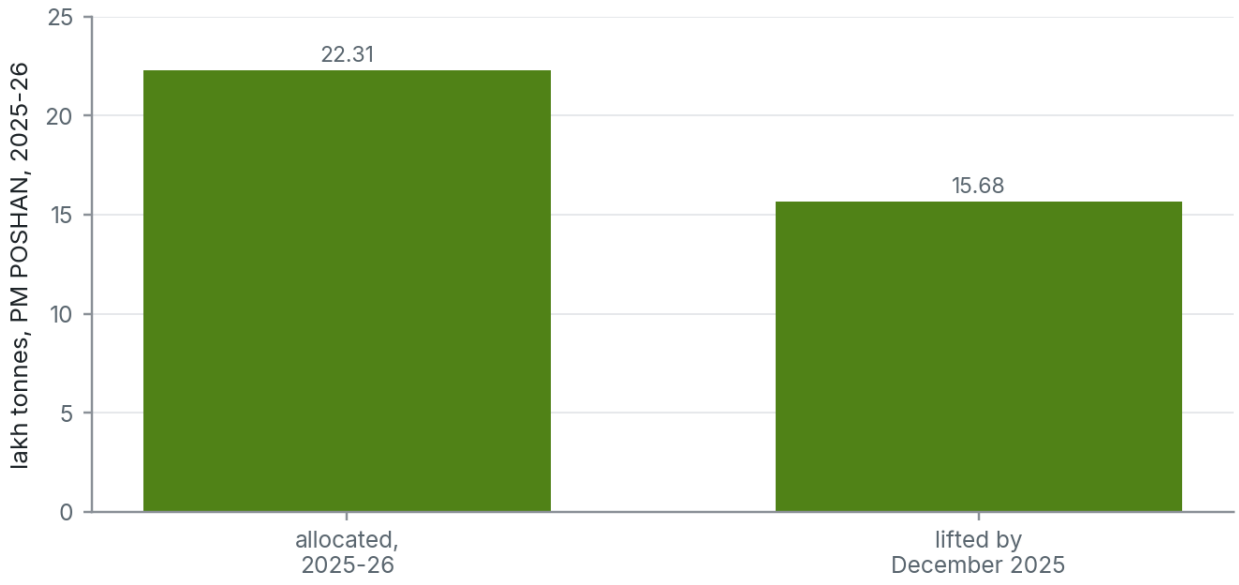
It is very big. The ration reaches about 81 crore people, that is about 810 million.

That makes the state one of the largest buyers, cooks and grocers in the country. It writes the rules for what an anganwadi may cook, down to whether it may use white sugar.

So a decision about a scheme's menu is a decision about the country's diet.



Foodgrains the Union allocated for 2025-26, in lakh tonnes (one lakh tonnes is 100 million kg). The ration's priority households take 428.63 and Antyodaya households 99.39. PM POSHAN school meals take 22.31 and the anganwadi grain, through the Wheat Based Nutrition Programme, 23.05. With the small festival and calamity allocation, 1.52, the bars add to the table's grand total of 607.40. Allocated, not lifted or eaten.



PM POSHAN grain in 2025-26, in lakh tonnes: 22.31 allocated, 15.68 lifted by December 2025, with a quarter of the year still to run. An allocation is grain set aside, not grain that reached anyone; grain lifted is still not grain eaten.

Illustration 1. Start with the sentence you will hear, because it is wrong in two ways at once.

> *The ration reaches 81.35 crore people, school meals 11.80 crore children and anganwadis 8.95 crore beneficiaries. So the state feeds over 100 crore people.*

Each number is real. The first is from the Cabinet's decision of 29 November 2023. The second is from a Press Information Bureau (PIB) release of 1 April 2022. The third is from a PIB back-

grounder of 14 April 2026, as on March 2026. That is the first fault: three years, added as if they were one.

The second fault is worse. The three counts are not of different people. A child in a priority household is counted in the ration. The same child may also be counted at school, or at the anganwadi. Adding the counts counts that child two or three times. The sum is not a number of people at all.

So measure the scale a way that does add up: in grain, from one table, for one year. Open the DFPD's Annual Report 2025-26 at https://dfpd.gov.in/WriteReadData/AnnualRecordUploadDocuments/43bf089b-73cc-4329-aeb6-c883d2f2ea55_Food%20AR%202025-26%20English.pdf and search for "Annual allocation of food grains for 2025-26". Read it the way Book 0, F1 taught: what one row is, what the column reports, in what unit. The figures are in lakh metric tonnes. A tonne is 1,000 kg, so one lakh tonnes is 10 crore kg, or 100 million kg.

Scheme	Allocated 2025-26, lakh tonnes
Antyodaya Anna Yojana (AAY)	99.39
Priority households (PHH)	428.63
Targeted PDS (TPDS) tide over	26.09
PM POSHAN	22.31
Wheat Based Nutrition Programme (anganwadi)	23.05
Welfare institutions and hostels	5.83
Scheme for Adolescent Girls	0.58

Tide over and the Scheme for Adolescent Girls are two smaller allocations the report names without explaining.

These rows can be added, because they are all grain, all allocated, all in 2025-26. The table's own grand total, with a small festival and calamity allocation, is 607.40 lakh tonnes, about 61 million tonnes. The paragraph above the table says 595.05. When a report's text and its table disagree, quote the table and say that you did.

Now check the scale against the people. Take the ration rows, AAY and PHH, and the report's own count of "around 80 Crore beneficiaries" under the Act, from the same report.

```
99.39 plus 428.63 = 528.02
```

That is 528.02 lakh tonnes, or 52,802 million kg. Divide by 800 million people.

```
52,802 divided by 800 is about 66
66 divided by 12 = 5.5
```

About 66 kg a person a year, or 5.5 kg a month. The Act promises 5 kg a person a month to a priority household. The allocation comes out a little higher, which fits: an Antyodaya household gets 35 kg a month whatever its size (for as many households as the Centre specifies for each

State). The two numbers from different parts of one report agree to within about a tenth. That is the kind of check that tells you the scale is real.

Figures quoted in this illustration are from [154, 178, 177, 236].

WHERE THIS PICTURE BREAKS. An allocation is grain set aside for a scheme, not grain that reached anyone. For PM POSHAN in 2025-26 the same report gives 22.31 lakh tonnes allocated and 15.68 lifted by December 2025, with a quarter of the year still to run. Grain lifted is still not grain eaten.

The 80 crore is a rounded count of ration-card beneficiaries, and the 5.5 kg a month is an average over households of every size. It says nothing about any one household.

Illustration 2. Now watch the state decide a menu.

Open the Mission Saksham Anganwadi and Poshan 2.0 Scheme Guidelines (Ministry of Women and Child Development, 2022) at https://wcd.gov.in/documents/uploaded/Mission%20Saksham%20Anganwadi%20and%20Poshan%202.0%20scheme%20guidelines.pdf and search for "jaggery".

> *Only jaggery should be used for sweetening; white sugar should not be used.*

A few lines on, search for "Millets".

> *Millets should be mandatorily supplied at least once a week*

Two sentences in a scheme guideline. They apply to the food cooked or packed for every registered beneficiary of anganwadi supplementary nutrition in the country. No shopper chose them and no shop stocked them. A ministry wrote them.

Now read what the same guidelines say about the programme before them, the anganwadi services of the Integrated Child Development Services (ICDS). Search for "calorie sufficiency".

> *The Anganwadi Services under ICDS have focused on ensuring calorie sufficiency, neglecting quality and diversity of diets*

That is the state's own account of its own design: built to fill a calorie gap. It matches what the last section's arithmetic showed about the ration, which is mostly cereal energy.

The same thing happens in the other channels. The DFPD's table allocates nutri-cereals in the ration "in lieu of wheat/rice", so the state chooses the grain. PM POSHAN encourages States to buy locally grown millets and vegetables for school meals. In each case a buying rule is a diet rule. When you read a scheme guideline, read it as a menu.

WHERE THIS PICTURE BREAKS. A rule in a guideline is not a rule on the plate. Whether a centre in fact uses jaggery, or serves millets every week, depends on the State that runs it. Poshan 2.0 is

carried out through the State governments, and PM POSHAN's day-to-day running lies with the States and Union Territories. The guideline tells you what was decided, not what was done.

MUST KNOW POINTS FOR YOU.

- "The state regulates food; people choose what to eat" misses most of Indian food policy. A change to what a scheme hands out changes what millions eat.
- Never add the beneficiaries of the ration, the school meal and the anganwadi to get "people the state feeds". The same child can sit in all three counts, and the counts come from different years.
- For 2025-26 the Union government allocated 607.40 lakh tonnes of foodgrains, about 61 million tonnes, by its Food Department's own table. The report's text says 595.05. When text and table disagree, quote the table and say which figure you used.
- As on March 2026 the anganwadi programme tracked about 14 lakh centres and 8.95 crore eligible beneficiaries. A single line in its guidelines, such as "white sugar should not be used", reaches all of them.
- The anganwadi guidelines say in their own words that the earlier programme focused on "calorie sufficiency, neglecting quality and diversity of diets". Quote the state's own sentence when you argue that its food schemes were built for hunger.
- Allocated is not lifted, and lifted is not eaten. So grain figures tell you what the state moved, never what anyone ate.
- A guideline is not a plate. The Union writes the norms and the States run the kitchens. Before you claim a scheme serves millets or avoids sugar, ask for evidence of what was served, not what was written.

EXERCISE 1 (retrieval). Name the three channels through which the Indian state hands out food. For each, name the ministry or department that runs it at the Union level, and give one scale figure with its date and its source.

EXERCISE 2 (critique). A draft op-ed says this.

> *India's food schemes are welfare, not nutrition policy. They just hand out grain. What people eat is decided by what they buy.*

Say what is wrong with it, using two things the state itself has written down.

15 · The double burden, and double-duty action

Checked against the sources as they stood on 2026-09-25.

DEFINITION. Undernutrition and overweight are measured with different yardsticks. India's National Family Health Survey, fifth round (NFHS-5, 2019-21), uses these. A child under five is stunted when height-for-age is more than two standard deviations below the World Health Organization (WHO) growth standard. The child is wasted when weight-for-height is more than two standard deviations below it, and underweight when weight-for-age is. The child is overweight when weight-for-height is more than two standard deviations above it. NFHS-5 counts women and men aged 15 to 49 as adults. An adult has a below-normal body mass index (BMI) below 18.5 kg/m^2, and is overweight or obese at 25.0 kg/m^2 or more. These are the cut-offs the fact sheet uses.

Among women aged 15 to 49, 18.7 per cent had a below-normal BMI and 24.0 per cent were overweight or obese.

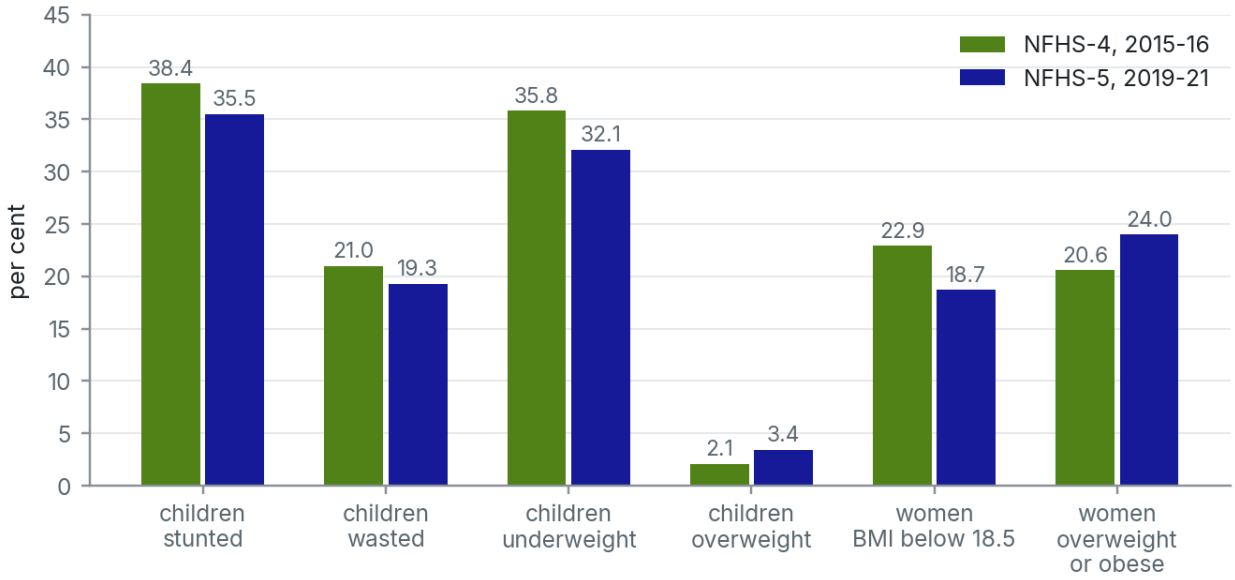
The WHO calls the coexistence of undernutrition (wasting, stunting, micronutrient deficiency) with overweight, obesity or diet-related noncommunicable diseases the double burden of malnutrition. It can occur in one person, one household or one population.

In the WHO's 2017 policy brief, *Double-duty actions for nutrition*, a double-duty action is an intervention, programme or policy with the potential to reduce the risk or burden of both at once. The WHO sets out three levels. Do no harm: check that an existing action does not raise the risk of the other forms. Retrofit: change an existing action so that it also acts on the other burden. De novo: design a new action for both from the start.

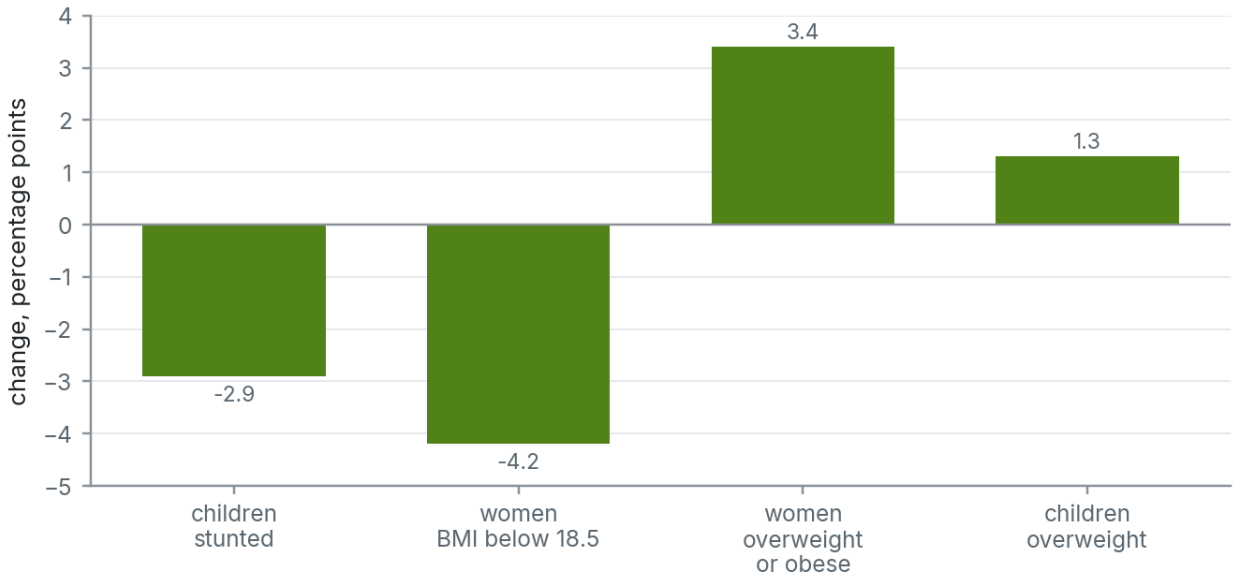
This book adds two reading words, in plain terms, for sorting a proposed change to a ration, a school meal or a take-home ration. They are this book's tools, not an official classification. A single-duty change acts on one burden and does not aim at the other. A change working against the other burden acts on one and, by its design, raises the risk of the other. Do no harm is the check that sorts a single-duty change from one working against the other burden. Retrofit and de novo produce double-duty actions. A change is shown to work against the other burden only by an outcome measured on that side. [237, 238, 239, 240, 241, 242, 243, 244, 245, 234, 230, 207, 246]

IN PLAIN TERMS. India is often described as having a hunger problem. It also has an overweight problem.

A programme built against one burden can feed the other. A ration or a meal designed only to fill a calorie gap can add to overweight where overweight is rising.



Six NFHS measures, India, in per cent, NFHS-4 (2015-16) beside NFHS-5 (2019-21). Stunting fell from 38.4 to 35.5 and thin women from 22.9 to 18.7. Overweight or obese women rose from 20.6 to 24.0, and overweight children from 2.1 to 3.4. Both burdens in one survey, moving in opposite directions.



The change from NFHS-4 to NFHS-5 in percentage points, NFHS-5 minus NFHS-4. Stunting fell 2.9 points and thin women 4.2. Overweight or obese women rose 3.4 points and overweight children 1.3. The two burdens moved in opposite directions.

Illustration 1. Start with the sentence you will hear in a meeting, because the table in front of you refutes it.

> *India's nutrition problem is undernutrition. Obesity is a rich country's problem.*

Open the NFHS-5 India fact sheet at https://dhsprogram.com/pubs/pdf/OF43/India_National_Fact_Sheet.pdf and find the key indicators 81 to 89. Each row gives four numbers:

NFHS-5 urban, rural and total, then the NFHS-4 total from 2015-16. Read it as Book 0, F1 taught: what a row is, what each column reports, in what unit.

Group	Measure	NFHS-4, 2015-16, per cent	NFHS-5, 2019-21, per cent
children under 5	stunted	38.4	35.5
children under 5	wasted	21.0	19.3
children under 5	underweight	35.8	32.1
children under 5	overweight	2.1	3.4
women 15 to 49	BMI below 18.5	22.9	18.7
women 15 to 49	overweight or obese, BMI 25.0 or more	20.6	24.0

Both burdens are there, in one survey of one country. Now read the direction. Take each change in percentage points, the plain difference between two percentages (Book 0, A4).

```
35.5 minus 38.4 = -2.9
18.7 minus 22.9 = -4.2
24.0 minus 20.6 = 3.4
3.4 minus 2.1 = 1.3
```

Stunting fell by 2.9 points and thin women by 4.2. Overweight or obese women rose by 3.4 points and overweight children by 1.3. By NFHS-5 the two women's rows had crossed: more women were overweight or obese than thin. Split by place, 33.2 per cent of urban women were overweight or obese against 19.7 per cent of rural women.

Now the second trap. Add the two women's rows.

```
18.7 plus 24.0 = 42.7
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That is allowed. A woman cannot have a BMI both below 18.5 and at 25.0 or more, and both rows exclude the same pregnant women. So 42.7 per cent of women aged 15 to 49 sat outside the band from 18.5 to just under 25.

Try the same with the children's rows for stunting and underweight: 35.5 plus 32.1. Stop. A short child is often also light for age, so the same child can sit in both rows. The sum counts her twice and means nothing. Add rows only when no one can be in both.

Figures quoted in this illustration are from [247].

WHERE THIS PICTURE BREAKS. The figures are national averages for 2019-21. They show the two burdens in one population. They cannot show whether the thin woman and the overweight wo-

man live in the same house, or whether one stunted child is also overweight. For that you need the survey's unit-level data, cross-tabulated, which a fact sheet does not give.

The adult rows cover ages 15 to 49 only, and join overweight and obese in one figure. They are not an obesity rate for Indian adults.

Illustration 2. Now use the WHO's levels, and this book's two words, on programmes you have already met.

Open the Mission Saksham Anganwadi and Poshan 2.0 Scheme Guidelines (Ministry of Women and Child Development, 2022) at https://wcd.gov.in/documents/uploaded/Mission%20Saksham%20Anganwadi%20and%20Poshan%202.0%20scheme%20guidelines.pdf and search for "calorie sufficiency". The sentence is about the anganwadi services of the Integrated Child Development Services (ICDS), the programme Poshan 2.0 brought under it.

> *The Anganwadi Services under ICDS have focused on ensuring calorie sufficiency, neglecting quality and diversity of diets*

The ICDS programme, in the state's own words, was built to close a calorie gap. That is a single-duty design: it aimed at one burden and set no check on the other.

Now open the Press Information Bureau's backgrounder of 14 April 2026 on Mission Poshan 2.0, at https://www.pib.gov.in/PressReleasePage.aspx?PRID=2251769&reg=3&lang=1, and search for "calorie-specific".

> *The old norms were largely calorie-specific; however, the revised norms are more comprehensive and balanced in terms of both quantity and quality of supplementary nutrition*

Further down, the 2025 Poshan Maah, a nutrition month run through anganwadi centres among others, lists "reduction in sugar and oil consumption to address obesity" among its themes. That is an existing programme against undernutrition being asked to carry an obesity aim as well. It has the shape of the WHO's second level, retrofit. The backgrounder reports no effect, so it shows the intention, not the result.

The third word needs a change you can test. Here is one, made up for this illustration: a State proposes to raise the energy of a take-home ration by adding sugar and refined oil, leaving its protein where it was. It would close a calorie gap faster. Among the women and older children who may share the packet, it would add energy with nothing else. Nationally a quarter of women aged 15 to 49 are already overweight or obese, and about one in five even among rural women. Those are national figures, not figures for the women in that State's anganwadi households, so treat them as a warning, not a measurement. On its design, read it as working against the other burden. The WHO's first level, do no harm, is the question that catches it.

Figures quoted in this illustration are from [247].

WHERE THIS PICTURE BREAKS. The sorting reads what a programme or a change is designed to do. It does not show what it did. A retrofit on paper can fail on the plate, and a single-duty pro-

gramme can happen to help the other burden. Only measured outcomes on both sides settle which it was.

Single-duty and working against the other burden are this book's reading words, not an official classification. The WHO brief does not use them, and no other source quoted here does, so do not present them as anyone else's terms.

MUST KNOW POINTS FOR YOU.

- "India's problem is hunger; obesity is for rich countries" is wrong on India's own survey. Say both in the same breath, every time.
- Between NFHS-4 and NFHS-5 the share of women aged 15 to 49 who were overweight or obese rose from 20.6 to 24.0 per cent. The burden is moving, not only sitting. So a programme designed for the burden as it was can be wrong for the burden as it is.
- Add prevalence rows only when nobody can sit in both. A sum of overlapping rows counts the same child twice.
- A national fact sheet shows the two burdens in one population. Do not claim a household-level double burden from it.
- Never quote 24.0 per cent as "the obesity rate among Indian women". It is overweight and obesity together, in women of reproductive age.
- Someone proposes a change to a ration, a school meal or a take-home ration. Before you back it, ask the WHO's first question out loud: does it raise the risk of the other burden? A change that adds energy and nothing else should be checked against it. Ask whose overweight trend it must be read against: NFHS-5 holds women 15 to 49 and children under five, not school-age children.
- The anganwadi guidelines describe their predecessor as built for "calorie sufficiency, neglecting quality and diversity of diets". Quote the state's own sentence when you argue that the schemes need retrofitting.
- "Single-duty" and "working against the other burden" are this book's words for sorting a change. Define them when you use them in a committee, or a hostile reader will ask whose terms they are. Only an outcome measured on the other side shows that a change worked against it.

EXERCISE 1 (critique). Three proposals reach a State nutrition committee. Sort each as double-duty, single-duty, or working against the other burden, using the WHO's three levels and this book's two words. Say what evidence would change your answer. All three proposals are made up for the exercise.

1. Raise the energy of the take-home ration for children aged 6 months to 3 years by adding more sugar, keeping protein the same.
2. Replace part of the rice in the school meal with a pulse and add a vegetable, keeping the meal's energy the same.
3. Add one more kilogram of rice a month to every priority household's ration.

EXERCISE 2 (teaching). A journalist has three minutes and asks: "Is India's problem hunger or obesity?" Give one quotable sentence and the confidence you have in it.

16 · The main Indian food policy tools, on one map

Checked against the sources as they stood on 2026-09-24.

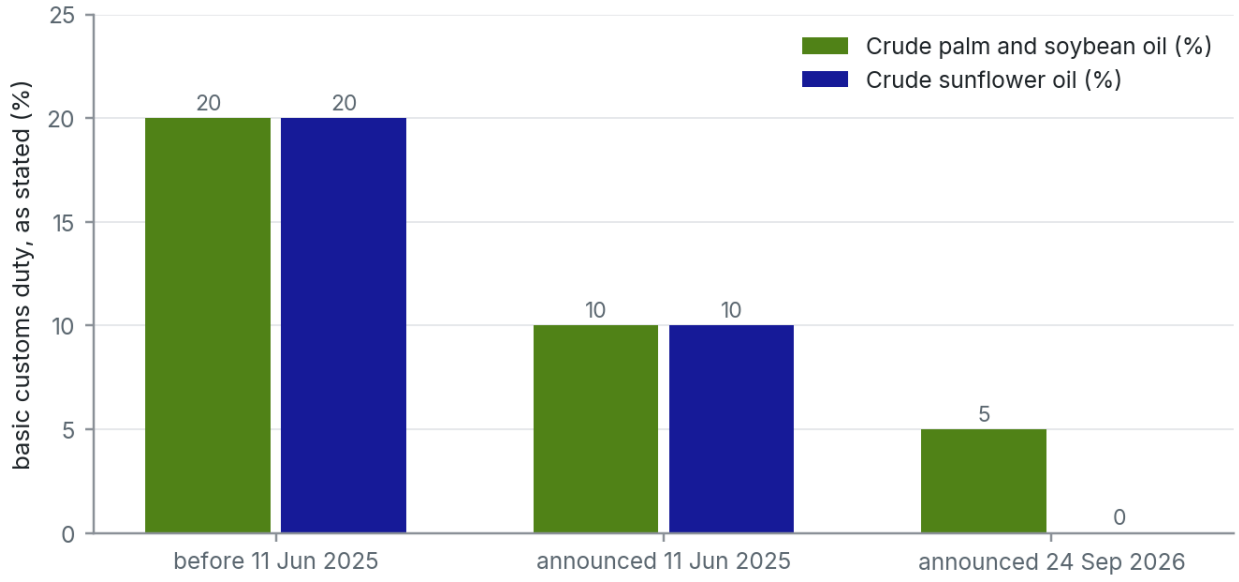
DEFINITION. A food policy tool is any means by which a government changes what is grown, stored, traded, processed, sold, served or eaten. Some tools rest on a statute. Others rest on a government decision to run a scheme, or to set a price or a duty until the next change.

Stage	Tool	Kind	Run by	Rests on
Production	Minimum support price (MSP) for 22 mandated crops	price support	Union Government, on the recommendation of the Commission for Agricultural Costs and Prices (CACP)	announced each season (the National Food Security Act defines the term; each season's figure is a Cabinet decision)
Production	Procurement at MSP	purchase	Food Corporation of India (FCI) and State agencies for cereals; two national cooperative federations for pulses and oilseeds	the same decisions, and a price support scheme for pulses and oilseeds
Production	Crop missions: oilseeds, oil palm, millets	scheme	Department of Agriculture and Farmers Welfare, with the States	schemes approved by the Union Government
Storage, distribution	Buying, holding and moving the central pool of grain, and its buffer stock	public stock	FCI	an Act of 1964, under which FCI was set up in 1965

Storage	Limits on how much of a grain traders may hold (wheat, May 2025 to April 2026)	holding limit	Government of India	a government decision; the release names no order or Act
Distribution	Regulated markets (mandis) and their fees	market regulation	State Agricultural Produce Marketing Committees (APMCs)	the States; no State law is held here
Distribution	Import duty	trade	Government of India	a duty change; its customs notification is not held here
Processing, retail	Food standards and labels	safety and labelling	Food Safety and Standards Authority of India (FSSAI)	Food Safety and Standards Act, 2006
Distribution	Rations through the public distribution system (PDS)	provision	Department of Food and Public Distribution, with the States	National Food Security Act, 2013 (NFSA)
Distribution, preparation	School meals, Pradhan Mantri Poshan Shakti Nirman (PM POSHAN)	provision	Ministry of Education, with the States	a centrally sponsored scheme, 2021-22 to 2025-26
Distribution, preparation	Anganwadi food, Saksham Anganwadi and Poshan 2.0	provision	Ministry of Women and Child Development, with the States	a scheme for 2021-22 to 2025-26
Retail	Goods and services tax (GST) rates	tax	recommended by the GST Council	the Constitution, Article 279A

IN PLAIN TERMS. For each tool, ask four things. Where in the chain does it act? Who runs it? What does it stand on, a statute or a scheme with an end date? What does its own text say it is for?

Ask the last question and a pattern shows. The tools on the farm, in storage and at the border say they are for supply, prices and farmers' incomes. The tools at the plate say they are for nutrition, and where they name a problem it is hunger or undernutrition. Obesity turns up in these texts only as a theme of two awareness campaigns in 2025, Poshan Pakhwada and Poshan Maah.



The basic customs duty on crude edible oils as two releases state it, in per cent: 20 before, and 10 from, the release of 11 Jun 2025; 5 for crude palm and soybean oil and 0 (Nil) for crude sunflower oil from the release of 24 Sep 2026. The same tool, three values.

Illustration 1. Here is the trap with a food policy number. It is true on the day it is written, and then it changes, and the old text stays online looking just as official.

Suppose a colleague asks you what India's import duty on palm oil is. Search the Press Information Bureau for the Cabinet's release of 3 October 2024 approving the National Mission on Edible Oils – Oilseeds (https://www.pib.gov.in/PressReleasePage.aspx?PRID=2061646). Read its last paragraph.

> *Besides, 20% import duty on edible oils has been imposed to protect domestic producers from cheap imports and encourage local cultivation.*

That release says "import duty on edible oils", not which duty or which oils. Write down 20% and you are wrong twice. Find the Bureau's release of 11 June 2025, "Centre reduces Basic Custom duty (BCD) on major imported Crude edible Oils from 20% to 10%". The basic customs duty on crude sunflower, soybean and palm oils fell from 20% to 10%. Then open the release of 24 September 2026 (https://www.pib.gov.in/PressReleasePage.aspx?PRID=2314297).

> *Accordingly, the BCD on Crude Sunflower Oil has been reduced from 10% to Nil, while the BCD on Crude Soybean Oil and Crude Palm Oil has been reduced from 10% to 5%.*

Nil means 0%. Set the two duty releases side by side.

Basic customs duty, as stated	Crude palm and soybean oil (%)	Crude sunflower oil (%)
before 11 Jun 2025	20	20
announced 11 Jun 2025	10	10

Basic customs duty, as stated	Crude palm and soybean oil (%)	Crude sunflower oil (%)
announced 24 Sep 2026	5	0

Now a second trap. The Bureau's backgrounder of 8 December 2025 on the edible oil missions says the government "raised the effective customs duty on crude edible oils like palm, sunflower and soybean from 5.5% to 16.5%". That is not the basic duty. The text calls it effective, and it is a different number. The held texts do not say what the effective duty adds to the basic duty. The release of 24 September 2026 gives the basic duty only. So when you repeat a duty, say which duty it is, and the date of the text you took it from.

Now look at what else acts on the same oil. Three tools, three bodies, three texts.

Tool	Stage	Run by	What its text says
National Mission on Edible Oils – Oilseeds	production	Department of Agriculture and Farmers Welfare	"reducing import dependency", "boosting farmers' incomes"
Basic customs duty cut, 24 Sep 2026	distribution (a trade instrument)	Government of India	"moderating domestic edible oil prices"
Labelling regulations, ingredient list	processing, retail	FSSAI	the label must "Give name of the specific edible oil"

The mission wants more oilseed grown in India. The duty cut wants cheaper oil in the shop. The mission also runs a campaign on "recommended dietary guidelines for edible oils". The label rule only makes the oil visible. Each tool is run by a different body through its own text. If you want to change how much oil reaches Indian plates, first find out which body owns the lever you are pulling.

Figures quoted in this illustration are from [276, 77, 76].

WHERE THIS PICTURE BREAKS. The duty rates hold from the release of 24 September 2026 until the next customs duty change. The release gives the basic duty on crude oils only. It does not give the refined-oil rates, the notification number, the date the change took effect, or any effective duty. The 20% row is the basic duty the release of 11 June 2025 says it cut from; the date the 20% began is not in these texts.

Illustration 2. Now sort the whole map by one question: what does each tool's own text say it is for?

Take each tool in turn. Find the sentence in which its text states its purpose. Copy the words, not your memory of them. Then ask whether the sentence names nutrition and, if it does, which problem it names.

Tool	Its own words	Nutrition named?
Minimum support price, kharif 2026-27	"to ensure remunerative prices to the growers for their produce"	no
Procurement and the buffer stock	"remunerative prices", "affordable prices", "food security and price stability"	no

Tool	Its own words	Nutrition named?
Wheat stock limits, 2025	"to prevent hoarding and unscrupulous speculation"	no
Edible oil duty cut, 2026	"moderating domestic edible oil prices, providing relief to consumers"	no
Millets sub-mission	"To boost the production of millets"	only in the name of its parent, the National Food Security and Nutrition Mission
Oilseeds mission	"reducing import dependency"; one campaign on "recommended dietary guidelines for edible oils"	one part of it
Food Safety and Standards Act	"safe and wholesome food"; labels with "claims on health, nutrition"	safety first, nutrition on the label
National Food Security Act	"food and nutritional security"	yes
PM POSHAN	"hunger and education by improving the nutritional status"	yes: hunger
Poshan 2.0	"to reduce wasting and under-weight prevalence besides stunting and anemia"	yes: undernutrition

Read down the right-hand column. The production, price, storage and trade tools state no nutrition aim, beyond one mission's name and one campaign. The provision tools state one. Where they name a problem, it is the hunger and undernutrition this book's history section described (section 8).

Now search the Poshan 2.0 backgrounder of 14 April 2026 (https://www.pib.gov.in/PressReleasePage.aspx?PRID=2251769&reg=3&lang=1) for the word obesity. It appears twice. The Poshan Pakhwada of April 2025 had a theme of "healthy lifestyle promotion to address childhood obesity". The Poshan Maah of September 2025 had "reduction in sugar and oil consumption to address obesity". Both are awareness campaigns. They speak to what people choose, not to what the scheme serves.

WHERE THIS PICTURE BREAKS. A stated aim is what a text says a tool is for. It is not what the tool does. A support price with no nutrition word in it still changes which crops are grown and what they cost (section 10 works the arithmetic). And the sort is only as good as the texts held: a scheme document not among this book's sources may state an aim these releases do not.

MUST KNOW POINTS FOR YOU.

- "India has no nutrition policy in agriculture" and "India's food policy is nutrition policy" are both wrong as stated. Read each tool's own purpose.
- For any food policy tool, write four things before you argue about it: where it acts, who runs it, what it rests on, and what its own text says it is for.
- Never repeat a duty, a price or a limit without its date. A Cabinet release of 3 October 2024 put the import duty on edible oils at 20%. The basic customs duty on crude palm oil fell from 20% to 10% in June 2025, and to 5% in the release of 24 September 2026.

- "Import duty" can mean the basic customs duty, or what a text calls the effective duty. They are different numbers for the same oil. Say which one you mean, and check which one your source gives.
- The same food is touched by tools that pull different ways, run by different bodies. The oilseeds mission wants more oil grown at home. The 2026 duty cut wants cheaper oil in the shop. Before you propose a change, name which body owns the tool you want changed.
- Check what each tool stands on before relying on it. The food safety law and the food security Act are statutes. PM POSHAN and Poshan 2.0 were approved as schemes for 2021-22 to 2025-26. Whether and how they continue after March 2026 is not in this book's sources, so look for the continuation before you cite either as current.
- Do not name the Act behind a stock limit from memory. Find the instrument itself and read what it says it is made under, or say that you have not seen it.
- The map tells you where a tool acts, who runs it and what it says it is for. It does not tell you what the tool does to what people eat.

EXERCISE 1 (retrieval). Without looking back, name one food policy tool at each of these stages: production, storage, distribution, processing, retail. For each, name the body that runs it.

Record your confidence as a percentage before turning to the answer.

EXERCISE 2 (interpretation). A newspaper line reads: "Government acts on oil prices, cuts duty to protect health." Using the release of 24 September 2026, say what the release does and does not support in that line.

EXERCISE 3 (teaching). A health secretary has one page and asks: "Which of our food policies were built with nutrition in mind?" Write the answer, answer first.

17 · Locating an intervention in the food system

DEFINITION. To locate an intervention is to state, for any proposal to change what people eat, three things. The stage of the food system at which it acts (section 1). The actor whose decision it changes. And the element of the food environment it moves: availability, price, "promotion, advertising and information", or quality, the four elements named by the High Level Panel of Experts on Food Security and Nutrition (HLPE) (section 5).

A proposal acts upstream when the decision it changes is taken before the person chooses: a farmer's crop, a processor's recipe or pack, a retailer's shelf, a price, a ration basket, a scheme's menu. A proposal acts on the person when the only decision it changes is the eater's own, made from an offer left as it was: advice, counselling, an awareness campaign. It changes nothing on offer: the food, its price and where it is sold stay as they were; at most it adds information. One proposal can act at more than one stage, and each is located separately. [277, 278, 279, 280, 281, 282, 273, 283, 284, 285, 286, 287, 255]

IN PLAIN TERMS. Most proposals about food and weight that you will hear speak to the person holding the plate. Eat less oil. Cut sugar. Choose millets. But what is on the plate was decided earlier, by people who grew, processed, priced, stocked and served it. The person chooses from what is already there.

So for any proposal, ask three questions. Where in the chain does it act? Whose decision does it change? And what does it change about the food on offer?

The second question does most of the work. If the only decision the proposal changes is the eater's, it acts on the person. The food on offer stays as it was. If it changes a decision taken before the eater chooses, such as a recipe, a price or a ration, it acts upstream.

Neither kind is good or bad by being where it is.

Illustration 1. Start with a real case where the obvious answer is right and still useless.

Open the Press Information Bureau's backgrounder "Mission Poshan 2.0 Strengthening India's Nutrition Ecosystem", 14 April 2026 (https://www.pib.gov.in/PressReleasePage.aspx?PRID=2251769&reg=3&lang=1). Search for Poshan Maah. The 2025 campaign's themes include "reduction in sugar and oil consumption to address obesity".

Ask the first question: which stage? Consumption. That is true, and you could stop there. But it hides the thing that matters. Ask the second question: whose decision does it change? Only the eater's, or a parent's choosing for a child. Ask the third: what does it change about the food on offer? Nothing. The shop, the price and the recipe stay as they were. So the campaign acts on the person.

Now open the scheme guidelines of the same programme, *Mission Saksham Anganwadi and Poshan 2.0: Scheme Guidelines* (2022) (https://wcd.gov.in/documents/uploaded/Mission%20Saksham%20Anganwadi%20and%20Poshan%202.0%20scheme%20guidelines.pdf). Search for jaggery. Section 3.4 says:

> *Only jaggery should be used for sweetening; white sugar should not be used.*

Ask the same three questions. The stage is preparation: the recipe of the take-home ration and the hot cooked meal. The decision it changes is the one taken by whoever makes that food under the scheme. What it changes about the offer is its quality, in the sense of what the food contains. The child receives whatever the recipe holds. This rule acts upstream.

Proposal	Stage	Whose decision	What it moves	Where it acts
Poshan Maah 2025 theme, less sugar and oil	consumption	the eater's	information only, nothing on offer	on the person
Poshan 2.0 guidelines, jaggery not white sugar	preparation	the scheme's cook or ration maker	quality	upstream

Same ministry, same topic, opposite places. Locate the mechanism, not the topic.

WHERE THIS PICTURE BREAKS. The method places a proposal; it does not grade it. Jaggery is still a sweetener, and this section says nothing about whether swapping it for white sugar changes what a child takes in. The guideline line is from the 2022 guidelines as held; the scheme's later revisions are not among this book's sources.

Illustration 2. Now work five more real proposals, each from a text this book holds. For each, write the three answers before you read the row.

Proposal, in its text's words	Stage	Whose decision	What it moves	Where it acts
Edible oil duty cut, 24 Sep 2026: "moderating domestic edible oil prices"	distribution (the importer's landed cost), then retail (the maximum retail price)	importers' landed cost; then, by advisory, industry's maximum retail price	price	upstream, at two stages
School meals (Pradhan Mantri Poshan Shakti Nirman, PM POSHAN): States to "procure locally grown food items like millets, vegetables"	distribution (the State's purchase), then preparation	the State or school as buyer and cook	availability on the plate	upstream
Millet incentive: products "must contain at least 15% millet by weight or volume"	processing	the processor's recipe and range	availability and quality	upstream
Oilseeds mission: "public awareness of recommended dietary guidelines for edible oils"	consumption	the eater's	information only, nothing on offer	on the person
World Cancer Research Fund's NOURISHING list, area N: "Nutrition advice and counselling in healthcare settings"	consumption	the patient's	information only, nothing on offer	on the person

Three things show up.

The duty cut acts twice. It lowers the importer's landed cost at the border. Then the release asks industry to revise its prices to distributors and its maximum retail price. Locate each step.

The oilseeds campaign sits inside a production mission, yet it acts on the person. Where a component is housed is not where it acts.

The millet incentive acts upstream, on what a factory makes. Its eligibility rule names a millet share, and nothing about sugar, fat or salt. Locating it tells you it changes what is on the shelf. It does not tell you whether that shelf is healthier.

Keep the counselling row in mind. It is the one tool you hold in a clinic. On this map it is also the last point in the chain.

Figures quoted in this illustration are from [288].

WHERE THIS PICTURE BREAKS. Each row places a proposal by what its own text says it does. A text can describe a measure that is not carried out as written. And a price moved upstream reaches the plate only if the change is passed along the chain; the duty release asks industry to pass it on, which shows it is not automatic.

MUST KNOW POINTS FOR YOU.

- Much of what reaches a plate was decided upstream, by a recipe, a price, a shelf or a ration. A campaign changes nothing on offer.
- For any proposal, write three answers: the stage, whose decision it changes, and what it changes about the food on offer.
- "It acts at consumption" is true of every campaign and says nothing. Always name the actor.
- Where a component is housed is not where it acts. The oilseeds mission is a production programme, and its campaign on "recommended dietary guidelines for edible oils" still acts on the person. Locate each component, not the programme's name.
- One topic can sit in two places. Poshan 2.0's 2025 campaign on less sugar acts on the person. The same scheme's guideline that "white sugar should not be used" acts on the recipe.
- In clinic, counselling is the tool you hold, and it acts on the person. Ask what the child is served before you advise the parent on what to cut.
- Locating a proposal tells you where it acts and through whom. It does not tell you whether it works, or in which direction.

EXERCISE 1 (interpretation). Locate each proposal. Give the stage and whose decision it changes. Say what it changes about the food on offer, and whether it acts upstream or on the person.

1. A rule that school canteens may not sell sugared drinks.
2. A warning printed on the front of food packs that are high in salt.
3. A television campaign telling parents to give children fewer fried snacks.

4. A tax on sugared drinks.

EXERCISE 2 (critique). A district plan reads: “Our obesity work has three parts: a Poshan Maah rally, the anganwadi rule on jaggery, and school nutrition gardens (PM POSHAN promotes school nutrition gardens). All three act on consumers.” Find the flaw.

EXERCISE 3 (teaching). A journalist has three minutes and asks: “Isn’t obesity about personal choice?” Answer using the idea of locating an intervention, in plain words, with one quotable sentence.

18 · Sketching the supply chain of a packaged product

DEFINITION. A supply-chain sketch of a packaged food is a written map of one product. It lists the main ingredients in the order the label gives them. It traces each ingredient to the crop or animal it comes from, and to the policy tools that act on that crop (section 16). It names the firm the label names, and the channel through which the product reached the buyer. And it marks every link with one of three marks: checked in a named source, seen on the pack or in the shop, or unknown.

Under the Food Safety and Standards (Labelling and Display) Regulations, 2020, the ingredients are listed in descending order of their weight or volume at the time of manufacture. The class "edible vegetable oil" must be named as the specific oil. The label names the brand owner, who may or may not be the maker. It declares a country of origin for a food imported into India. It does not say where the ingredients of an Indian-made food were grown, who supplied them, or what any of them cost. [277, 289, 274, 290, 291, 292, 293, 249, 294]

IN PLAIN TERMS. This is the book's build. You take one packaged food you eat often. You write down where it came from, as far as you can find out, and where you cannot.

Start with the label. Its ingredient list is in order of weight, heaviest first (section 3). So the first few names are the heaviest in the packet. Those are the ones to trace.

For each one, ask what it is made from. Maida is wheat. Sugar is sugarcane. Palm oil is oil palm. Then ask which of the state's tools act on that crop.

Mark every link. Checked, if you found it in a source you can name. Seen, if it is on the pack or in the shop. Unknown, if neither. Leave the unknowns in.

ILLUSTRATION. Here is the trap, and a first sketch falls into it. The label lists palm oil, so you write "palm oil, imported from abroad". It looks like knowledge. It is a guess.

Open the Food Safety and Standards (Labelling and Display) Regulations, 2020 (https://www.fssai.gov.in/upload/uploadfiles/files/Comp_Labelling%20Display_Version%20VIII_09_09_2025.pdf). Search for "Country of Origin". The clause is headed "Country of Origin for Imported Foods".

> *The country of origin of the food shall be declared on the label of food imported into India.*

If your biscuits were made in India, the label owes you no origin for the oil inside them.

Now build the sketch properly. Take a packet of plain biscuits from a kirana, a small neighbourhood shop. Suppose its list begins as below. This list is made up for the exercise, so read your own packet beside it.

> *Refined wheat flour (maida), sugar, palm oil, dextrose, milk solids, iodised salt, raising agents.*

Take the first four ingredients, and milk solids and salt as well. For each, find its crop and the tools that act on it. A quintal is 100 kg.

Ingredient	From	Tools acting on it, as of September 2026	Mark
Refined wheat flour	wheat	Support price for wheat, Rs 2,585 per quintal, rabi marketing season 2026-27 (PIB backgrounder, 10 October 2025); bought into the central pool by the Food Corporation of India (FCI)	tools on wheat checked; whether they touched this flour's wheat, and how, unknown
Sugar	sugarcane	Fair and remunerative price of sugarcane, Rs 365 per quintal at a "basic recovery rate of 10.25%" (the release does not define recovery), sugar season 2026-27 (October to September), approved by the Cabinet Committee on Economic Affairs	tool checked; the mill unknown
Palm oil	oil palm	Basic customs duty on crude palm oil 5%, from the release of 24 Sep 2026; oil palm mission	crude palm oil duty checked; the refined-oil rate is not in the release; whether either applies to this oil unknown
Dextrose	glucose, from a crop the label does not name (section 3) | none traced | crop unknown |		
Milk solids	milk	none on this book's map	unknown
Iodised salt	salt	none on this book's map	unknown
The packet itself	the factory	Labelling regulations, 2020; goods and services tax (GST), rate not held	labelling seen on the pack; GST unknown

Now the firm and the channel. Find the line on the pack beginning "Manufactured by" or "Marketed by". The regulation requires the brand owner's name and address, "whether or not, he himself is the manufacturer". So "Marketed by" tells you who owns the brand. Mark the brand owner as seen. If the maker differs, the pack must also carry the maker's FSSAI licence number (regulation 5(7)(b)); mark it seen. This book does not look the number up.

The channel you know: you bought it at a kirana. Mark that seen. Who brought it to the kirana, and from which depot, the pack does not say. Mark it unknown.

Count your marks. In this sketch the tools on wheat, sugarcane and oil palm are checked. The brand and the shop are seen. Almost everything between the farm and the factory is unknown. That is the right result.

Figures quoted in this illustration are from [295, 296, 77].

WHERE THIS PICTURE BREAKS. The figures in the table are the ones in force or announced on 24 September 2026. The ingredient list is invented, so its order holds only for this made-up packet.

MUST KNOW POINTS FOR YOU.

- "The label tells you where the food came from" is wrong for an Indian-made product. Where an Indian-made packet's wheat, sugar or oil was grown is not on it.
- Mark every link of a sketch as checked, seen or unknown, and name the source for every "checked". Leave the unknowns visible.
- Do not apply a national figure to one product. The 56.25% import dependence is for all edible oils in India in 2023-24.
- The name on the pack is the brand owner, who may not be the maker. Do not name that company as the factory unless the pack says "Manufactured by".
- One packet of biscuits holds the decisions of several bodies. When someone proposes changing that product, your sketch shows which body owns each lever.
- A sketch with no prices cannot say who earns what along the chain.

EXERCISE 1 (build). Write a supply-chain sketch of one packaged food you or your patients eat often. Buy it, or take it from a shelf at home. On no more than two pages:

1. Copy the name of the food and its ingredient list exactly as printed.
2. Take the first four ingredients. For each, name the crop or animal it comes from. Then name every policy tool from this book that acts on that crop, with its current figure and date.
3. Name the brand owner and, if the pack says so, the maker, with the exact words the pack uses.
4. Name the shop or platform you bought it from. Say what you know of how it got there.
5. Mark every link checked (name the source), seen, or unknown.
6. Write one line on what you would need to know to estimate the farmer's share of its price.

EXERCISE 2 (critique). A trainee's sketch of an Indian-made namkeen reads: "Palm oil: imported, from the label. Wheat: grown in Punjab, bought by FCI. Brand: made by the company named after 'Marketed by'." Find each error.

EXERCISE 3 (interpretation). A label reads, in part: "Ingredients: Refined wheat flour (maida), sugar, edible vegetable oil, milk solids." Which part of this list does the labelling regulation not allow as written, and what would a correct label say instead?

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An entry marked outstanding has not yet been checked against the source itself. Nothing in these sections rests on one: the reasoning is a derivation you can check with a calculator, and the entry records an anchor still to be supplied.

Appendix · Worked answers

1 · What a food system is

EXERCISE 1. One possible sketch, every line of it guessed until checked:

Production: a dairy farmer; feed, water and labour go in; raw milk comes out. Storage: someone who chills and holds the milk; raw milk goes in; chilled milk comes out. Processing: a dairy plant; chilled milk goes in; treated milk in packets comes out.

Distribution: a transporter; packets go in; packets at a shop or a doorstep come out. Retail: a shop or a delivery person; packets and your money go in; a packet in your home comes out. Preparation: whoever boils it or makes tea; milk and fuel go in; tea or boiled milk comes out. Consumption: the household drinks it.

Waste: the empty packet and any spilt or spoiled milk go to the bin or the drain.

The honest result is that almost every line is marked “guessed”. That is the point of the exercise. You can name the stages from memory. Naming the real actors takes a source, and most of us have never checked one for the milk we drink every day.

EXERCISE 2. The speaker has shrunk the food system to one stage, production. By HLPE’s definition the system also holds storage, processing, distribution, retail, preparation, consumption and waste, and the actors at each.

So “a food system problem” does not point to farmers any more than to mills, shops or kitchens. The fair question back is: at which stage, and whose decision, do you think the problem arises? The claim may still be right about farming. It has not been argued yet.

EXERCISE 3. Draw a line of eight boxes: production, storage, processing, distribution, retail, preparation, consumption, waste. Put a small figure beside each box for the actor: farmer, trader, mill, transporter, shopkeeper, cook, eater, bin.

Then say it. A diet is what happens in the seventh box. Most of what reached it was decided in the first five, by other people, before the patient chose anything. The word “system” is there because the boxes feed each other. The mill’s output is the shop’s input. The shop’s shelf is the cook’s starting point.

Finish with the boundary. Draw a circle round the last three boxes and call it the kitchen. Draw a bigger one round all eight and call it India. Ask the resident which circle a clinic advice leaflet works inside. It works inside the small one.

2 · One fresh food from field to plate in India

EXERCISE 1. They show that tomato lost more than paddy at both stages. It lost about twice as much on the farm and about five times as much at market. They also show that for both crops more was lost in farm operations than at market level.

They do not show a total loss for either crop. The release gives none, and it does not say whether the two percentages share a base. They do not show why tomato loses more. A reader may guess at softness and spoiling, but the table does not say so. And they say nothing about household waste, which this table does not measure at all.

EXERCISE 2. The figure is real. It is UNEP's Food Waste Index Report 2024: 78,192,338 tonnes a year, or 55 kg per person, for household food waste in India.

But it is an estimate, not a count. UNEP built it from seven local studies and scaled them to the whole population, and UNEP itself rates it "medium confidence". It also includes inedible parts such as peels and bones.

Offer them a line they can quote. "A UN estimate from a few local studies puts it at 55 kg per person a year, peelings included." That keeps the number and tells the reader how firm it is.

EXERCISE 3. A sketch for tomatoes bought from a cart might read:

Farmer, guessed; the district could be checked from state production data. A mandi, guessed; the vendor may name the mandi if asked. A commission agent and a trader, guessed; a study of the route, such as the Reserve Bank's paper, describes them for some cities. The cart vendor, checked, because you saw them. Your kitchen, checked.

Most lines will be guessed. The skill is not to know the chain. It is to say which parts you know, which you assume, and where you would look.

3 · A packaged food is many chains meeting

EXERCISE 1. Besan starts with a pulse crop, gram, and goes through a farm, a trader and a mill. Palmolein starts with the oil palm and goes through a plantation, an oil mill and a refinery; the label does not say in which country. Peanuts start with the groundnut crop. Iodised salt starts wherever the salt is made.

"Spices and condiments" hides several chains. The class-title table in regulation 5(2)(d) lets all spices, herbs and condiments, and their extracts, be declared under one class title. So chilli, turmeric or cumin, each with its own farms, may sit behind those three words. The edible oil, by contrast, had to be named, which is why you know it is palmolein.

EXERCISE 2. Eighth means milk solids weighed less than each of seven other ingredients at manufacture. It does not say how little. Seven heavier ingredients could leave milk solids as a large share or a tiny one.

The front of the pack emphasises milk in words and a picture. Regulation 5(2)(g) requires the percentage of an ingredient emphasised that way, subject to listed exemptions. So look for a percentage beside milk solids. If none is there, the list is not answering the question your friend is asking. Whether the label complies is a question for FSSAI, not something the order can settle.

EXERCISE 3. Because a packet of biscuits is several farm chains meeting in one factory.

The label regulation fixes only how the packet declares its ingredients. What goes into it, at what price, was decided further back. Wheat, sugar, edible oil and milk each came through farmers, traders and mills before the factory bought them. A change in any one of those chains reaches the biscuit through the factory's buying.

So a question about what is in the packet is also a question about farms, mills and trade. The label is where you start reading, not where the answer is.

4 · Where the consumer's rupee goes: the price build-up

EXERCISE 1. The hands, in order:

- the farmer, who sold at the mandi
- the mandi, which took a market fee, and the commission agent, who took a commission
- labourers and packers, paid by the processor
- a transporter to the mill
- the mill, which bore the losses to impurities, milled and packed
- a transporter to the wholesaler
- the wholesaler
- the retailer

The farmer's share.

```
77 divided by 110 times 100 = 70.0
```

About 70 per cent, as the paper states. The largest addition after the farmer is the retailer's Rs 15.

```
15 divided by 110 times 100 = 13.6 per cent
```

About 14 per cent of the shop price.

What the column cannot tell you: how much of the retailer's Rs 15 was cost and how much was margin. The paper says retailers have higher mark-ups because they "deal with smaller volumes and incur storage (display) costs". So the Rs 15 includes costs, but the table does not say how much.

EXERCISE 2. Answer first.

> *In the RBI's 2024 study, a tomato farmer got about Rs 33 of every Rs 100 a Delhi shopper paid. Part of the rest paid for moving, handling and spoilage.*

Then the explanation. Between the field and the shop, a tomato is sold several times. Each buyer pays for a lorry, a market fee, a commission, loading, and the tomatoes that spoil. Those costs go into the price. The farmer's share is what is left for the farmer.

Say what the figure does not show. It does not say the traders keep two-thirds as profit. The same paper put traders' margin at 5.3 per cent against a mark-up of 21.3. It says the retailer's margin is the largest, without giving it. It is one route, to Delhi, in one period. And the farmer's Rs 33 is before the farmer's own costs of labour and transport.

Calibrate. The pattern, fruit and vegetables at about a third and pulses much higher, is solid across the RBI's papers. The exact figure for any one town this month is not known.

1. The mark-up is the selling price minus the buying price.

```
50 minus 40 = 10
```

On the buying price.

```
10 divided by 40 times 100 = 25
```

As a share of the selling price.

```
10 divided by 50 times 100 = 20
```

Ten rupees, 25 per cent on cost, 20 per cent of the selling price. The percentage on the buying price is the larger, because 40 is the smaller base.

2. Farmer's share is farm-gate price divided by retail price, times 100.

```
18 divided by 60 times 100 = 30
```

Everything added after the farm gate is the difference.

```
60 minus 18 = 42
```

A share of 30 per cent, and 42 added.

3. (a) Forty per cent of the retail price reached the farmer.

```
40 divided by 100 times 75 = 30
```

A farm-gate price of 30.

1. Now the retail price is the unknown. The farm-gate price is 30 per cent of it, so divide the farm-gate price by 30 and multiply by 100.

```
24 divided by 30 times 100 = 80
```

Check it forwards: 24 divided by 80 times 100 = 30. A retail price of 80.

4. Build the price first.

```
20 plus 5 plus 3 plus 12 = 40
```

Then each amount as a share of 40.

```
20 divided by 40 times 100 = 50
5 divided by 40 times 100 = 12.5
3 divided by 40 times 100 = 7.5
12 divided by 40 times 100 = 30
```

The shares add to 100, as they must when nothing is rounded.

```
50 plus 12.5 plus 7.5 plus 30 = 100
```

5. The farmer's share.

```
381 divided by 552 times 100 = 69.0 per cent
```

About 69 per cent, which is what the paper prints.

What was added after the farm.

```
552 minus 381 = 171
```

Rs 171 per 100 eggs, in the Delhi region, in April 2021.

6. The wholesaler sold to the retailer, who then added Rs 6. So the wholesaler sold at the retail price less Rs 6, and bought at that less its own Rs 2.

```
71 minus 6 = 65
65 minus 2 = 63
```

Rs 63 per kilogram. Now the two percentages.

```
2 divided by 63 times 100 = 3.2 per cent
2 divided by 71 times 100 = 2.8 per cent
```

3.2 per cent on the buying price, 2.8 per cent of the retail price. The table prints 3, because every share column in it is against the final retail price.

7. A share of 33.5 per cent means 33.5 rupees out of every 100, so the farmer's part is Rs 33.50. Everything after the farmer got the rest.

```
100 minus 33.5 = 66.5
```

Rs 66.50 to all later steps together.

The paper says the farmer's share "includes overhead costs of labour and transportation over and above his cost of cultivation". So the Rs 33.50 has to pay for growing the crop, for labour, and for taking it to market.

8. Pair the low farm price with the low retail price, and the high with the high.

```
62 divided by 149 times 100 = 41.6 per cent
67 divided by 155 times 100 = 43.2 per cent
```

About 42 to 43 per cent, as the paper prints. Now cross the pairs.

```
62 divided by 155 times 100 = 40.0 per cent
67 divided by 149 times 100 = 45.0 per cent
```

The ranges allow anything from 40 to 45 per cent. The paper's 42 to 43 matches the paired division. The table does not say the two prices moved together.

9. Add the parts.

```
35 plus 3 plus 2 plus 1 plus 2 plus 1 plus 1.5 plus 3.5 = 49
```

It closes at Rs 49 a litre. The farmer's share.

```
35 divided by 49 times 100 = 71.4 per cent
```

About 71 per cent, which the paper prints as 71.

The retailer bought at the retail price less its mark-up, then marked up on that.

```
49 minus 3.5 = 45.5
3.5 divided by 45.5 times 100 = 7.7 per cent
```

7.7 per cent on the retailer's buying price, per litre of milk from this one cooperative.

10. The second line broke. The table's 8 per cent is a share of the retail price, Rs 6 out of Rs 71. It is not a percentage added on the buying price. Dividing by 1.08 treats it as one.

The buying price comes straight from the rupees.

```
71 minus 6 = 65
6 divided by 65 times 100 = 9.2 per cent
```

The retailer bought at Rs 65 and added 9.2 per cent on that.

Why the wrong answer looks reasonable: 65.74 is close to 65. At small percentages the two bases give nearly the same answer, so the slip hides. Try the same move on tur. The retailer's share there is 14 per cent, and 111 divided by 1.14 gives about 97.4. The true buying price is 95. The larger the mark-up, the larger the error.

11. The last line added two percentages of two different wholes. Each Rs 100 is a separate whole. Add the rupees, then divide by all the rupees spent.

```
33.5 plus 65 = 98.5
100 plus 100 = 200
98.5 divided by 200 times 100 = 49.25
```

Rs 98.50 of the Rs 200 reached farmers: about 49 per cent, not 98.5.

Why the wrong answer looks reasonable: the rupee amount, Rs 98.50, is right, and the arithmetic in the line is right. Only the per cent sign is wrong. A percentage cannot be added to a percentage of a different whole. There is a second problem. The two shares are from two papers, two routes and two periods. Even the corrected 49 per cent describes no real household.

12. What to compute: the part of the consumer rupee that did not reach the farmer, from the RBI tomato paper's 33.5 per cent.

```
100 minus 33.5 = 66.5
```

Rs 66.50 of every Rs 100 went to steps after the farmer. The first sentence holds for the route the paper studied.

What it does not establish. It does not establish that Rs 66.50 was pocketed. Those rupees are mark-ups, and the paper says "mark-ups include costs plus margin": transport, mandi fees, commission, loading and the tomatoes that rot. For traders, a mark-up of 21.3 per cent held a margin of 5.3 per cent. The paper does not state the base of the 5.3, but read beside the 21.3 it is a small part of it. The paper says the retailer's margin is the largest, without giving it. The figure is also for Delhi, and not for this district. And the farmer's own Rs 33.50 is before the farmer's labour and transport.

Say it in the meeting as: "Farmers get about a third. Part of the rest pays for moving, handling and spoilage. We would need each step's costs to say who earns too much."

13. What to compute: how much of the tur retail price each group of steps adds, from the RBI table (Delhi, May 2023, Rs per kg). Start with the claim's own version, every step after the farmer removed.

```
111 minus 72 = 39
39 divided by 111 times 100 = 35.1 per cent
```

A fall of about 35 per cent, roughly the third the proposal claims. But that price is only reached if nobody mills, packs or moves the tur. The farmer sells whole tur at the mandi; dal has to be milled. Keep the processing, packaging, transport and losses. Remove the mandi's fee and commission, which a farmer selling straight skips, and the wholesaler's and the retailer's mark-ups.

```
2 plus 3 plus 16 = 21
111 minus 21 = 90
21 divided by 111 times 100 = 18.9 per cent
```

About 19 per cent, a little more if part of the Rs 4 handling row was mandi work, which the table does not split. Even that assumes nobody is paid for the retailer's work of selling in small amounts and holding stock on display.

What it does not establish. Whether the fall would reach the consumer rather than the new seller. Whether the farmer would get more, since someone must still carry the costs the removed steps paid. And whether any of it holds for another pulse, another city or another month. The table gives the size of the prize. It does not say anyone can collect it.

5 · Who decides what is available, at what price, in what place

EXERCISE 1. The unstated premise is that the healthy food is already there, cheap enough, not drowned out by promotion and good enough to buy. On that premise, knowing is the only thing missing. Book 0, F4 would call this a premise that has to be true for the conclusion to follow. Nothing in the plan checks it.

What the line leaves out, element by element.

What is there, and how near: which foods the shops and carts in the district stock. The actors are the retailers, and upstream the traders who choose what to bring in.

What it costs: the price at the shop. The actors include the state market committees that fix fees at the first sale, and every hand's mark-up. The state's own ration and meal prices come later in the book.

How it is promoted: brand spending and shelf placement. The actors are processors and retailers.

What quality, and is it safe: grading, freshness and safety. The actors are the farmers and traders who grade, the retailers who store, and FSSAI, which sets safety rules.

A camp changes only what the person knows and picks. It may help. It cannot fill a shelf.

EXERCISE 2. Draw a line across the board. On the left write the stages: farm, mandi, processor, wholesaler, retailer. On the right, a person. Where the line meets the person, draw a box and label it with the four elements: what is there, price, promotion, quality.

Then walk one food along it. Take an onion in Delhi. The farmer chose the crop. A trader chose which grade came to Delhi. A state committee fixed the fee at the first mandi.

Four sets of hands added their mark-ups. A retailer chose the street. Only then does the patient arrive and choose.

The point for clinic: the patient's choices are real, and they are made inside that box. Ask what is sold near them and what it costs before you decide what advice they can use.

End on the limit. The drawing shows who decides. It does not show how much any one decision changes what the patient eats. That needs studies, and the drawing is not one.

6 · Where a country's food comes from: production, imports, stocks

EXERCISE 1. Net imports of -4682 mean India exported 4,682 thousand tonnes more wheat than it imported. Change in stocks of -10645 means the stocks the table counts fell by 10,645 thousand tonnes.

The identity: net production, plus net imports, minus the change in stocks.

```
97,177 minus 4,682 plus 10,645 = 1,03,140
```

Against 1,03,142 printed: out by 2, which is rounding. The row closes.

Stocks helped. They fell, so 10,645 thousand tonnes came out of store and were available. That is about a tenth of the year's net availability.

```
10,645 divided by 1,03,142 times 100 = 10.3 per cent
```

Say it with its limit. This is the stock the table counts. Its note says stocks held by traders, producers and consumers are not taken into account.

EXERCISE 2. Answer first.

> *In cereals, yes: India grows more rice and wheat than it keeps. In pulses and cooking oil, no: more than half the oil India used in 2023-24 was imported.*

Then the numbers, one each. For cereals in 2022-23, production was about 111 per cent of what the country kept. For edible oil in 2023-24, the government's own figure for import dependence is 56.25 per cent.

Then the limit, plainly. "Self-sufficient" here means the country grew enough of that food to cover what was available. It does not mean every family had enough, and it does not say whether people ate too little or too much. Availability is not what people ate.

Confidence. The direction for each food is solid, from official tables. The exact percentages depend on the year and the definition. One row of the cereal table for 2022-23 does not add up, so I would not quote the cereal figure to the decimal.

1. Production plus imports minus exports, minus the rise in stocks.

```
800 plus 50 minus 30 minus 20 = 800
```

Supply of 800. If the stocks had fallen by 20, that grain came out of store and is added.

```
800 plus 50 minus 30 plus 20 = 840
```

Supply of 840. The same harvest gives two supplies 40 apart, twice the stock change.

2. Turn the tonnes into kilograms, then share them out.

```
73,000 times 1,000 = 7,30,00,000
7,30,00,000 divided by 20,00,000 = 36.5
```

36.5 kilograms a person a year. Now into grams, then days.

```
36.5 times 1,000 = 36,500
36,500 divided by 365 = 100
```

100 grams a person a day.

3. The denominator for both is production plus imports minus exports.

```
30 plus 70 minus 0 = 100
70 divided by 100 times 100 = 70
30 divided by 100 times 100 = 30
70 plus 30 = 100
```

Import dependence 70 per cent, self-sufficiency 30 per cent. With no exports they add to 100.

4.

```
90 plus 30 minus 20 = 100
30 divided by 100 times 100 = 30
90 divided by 100 times 100 = 90
30 plus 90 = 120
```

Import dependence 30 per cent, self-sufficiency 90 per cent, sum 120.

The two tops, imports and production, add to 120. The shared bottom has had the 20 of exports taken off, so it is 100. Some of what was produced left the country, yet it still counts on top of the self-sufficiency ratio. That is why the FAO says one is not the complement of the other.

5. Before stocks, the flows give this.

```
520 plus 10 minus 40 = 490
```

Supply was 500, which is 10 more than the flows alone give. The extra 10 must have come out of store.

```
500 minus 490 = 10
```

Stocks fell by 10. Check it forwards: 520 plus 10 minus 40 plus 10 = 500.

6. Thousand tonnes divided by thousand persons gives tonnes a person.

```
2,89,063 divided by 13,92,329 = 0.20761 tonnes
0.20761 times 1,000 = 207.61
207.61 times 1,000 divided by 365 = 568.8
```

207.6 kilograms a person a year and 568.8 grams a person a day of foodgrains available in 2022-23, as the table prints.

7. Grams a day to kilograms a year.

```
568.8 times 365 = 2,07,612
2,07,612 divided by 1,000 = 207.612
```

207.612 kilograms, which is 0.207612 tonnes a person a year. Times the population in thousands gives thousand tonnes.

```
0.207612 times 13,92,329 = 2,89,064.2
```

About 2,89,064 thousand tonnes, against 2,89,063 printed. The difference of about 1 comes from 568.8 having been rounded to one decimal. Going back from a rounded figure never lands exactly.

8.

```
12.18 plus 15.66 = 27.84
15.66 divided by 27.84 times 100 = 56.25
12.18 divided by 27.84 times 100 = 43.75
```

Import dependence 56.25 per cent, self-sufficiency 43.75 per cent. Exports were left out, because the release gives no edible-oil export figure. The import figure matches the release. The release prints 43.74 for self-sufficiency, one hundredth lower than the two figures it gives. Report 43.75 with the working, or 43.74 as the release's figure, and say which.

9. Kilograms a year into grams a day.

```
10.58 times 1,000 divided by 365 = 28.99
11.78 times 1,000 divided by 365 = 32.27
```

About 29 grams a day rural and 32 grams a day urban.

The rural rise, against the starting value.

```
10.58 minus 5.76 = 4.82
4.82 divided by 5.76 times 100 = 83.68
```

A rise of 83.68 per cent, the release's own figure. These are consumption figures, not the supply worked out in this section. The release does not say which survey they come from.

10. The third line added the change in stocks. The 615 is a rise: grain went into store, so it was not available and comes off.

```
22,801 plus 1,733 minus 615 = 23,919
```

23,919 thousand tonnes, which is the table's printed figure.

Why the wrong answer looks reasonable. The column is headed "Change in Stocks" with no sign word. Every other term in the line is added. The error is twice the stock change, 1,230 thousand tonnes here, and it would have gone unnoticed without the printed total to check against. Say "a rise comes off" before you write the sign.

11. The second line put net imports where imports belong. The import dependency ratio needs imports alone. Net imports are imports minus exports, and a negative figure only says exports were larger. A country can import a great deal of one cereal and export more of another; the net figure hides both.

From this table the ratio cannot be worked out at all. What can be worked out is the self-sufficiency ratio, whose denominator needs only production plus net imports.

```
3,03,628 divided by 2,73,276 times 100 = 111.1 per cent
```

Why the wrong answer looks reasonable: the denominator is right, and a negative number feels like it means "not dependent". But no share of a supply can be below zero. A negative percentage of a whole is a sign that a wrong quantity went on top.

12. The third line gave the wrong unit. Net availability is in thousand tonnes and population in thousand persons. The thousands cancel, so 0.2076 is in tonnes a person.

```
0.2076 times 1,000 = 207.6
```

207.6 kilograms a person a year, a thousand times more than the working said.

Why the wrong answer looks reasonable: the division is right, and 0.2 looks like a sensible small number. Two hundred grams of grain a year would be a few days of meals, which a size check catches at once. Write the unit on every line.

13. What to compute: the requirement the target assumes, and how it compares with the supply in 2023-24.

```
25.45 divided by 0.72 = 35.35
```

About 35.35 million tonnes of projected requirement. In 2023-24, production plus imports was 27.84 million tonnes, with exports left out because the release gives none.

```
35.35 minus 27.84 = 7.51
7.51 divided by 27.84 times 100 = 26.98
```

The target assumes the requirement grows by about 27 per cent over 2023-24.

What this does not establish. That 72 per cent will be reached: it is a target. That the remaining 28 per cent will stop being imported: by the target's own arithmetic it will not.

```
35.35 minus 25.45 = 9.9
```

About 9.9 million tonnes a year would still have to come from abroad. And self-sufficiency is a trade measure. It says nothing about whether a rise in the oil people use is good for their health. That is a separate question, and this calculation cannot answer it.

14. What to compute: the rise, then what drove it, using the identity on the two FOODGRAINS rows.

```
568.8 minus 514.6 = 54.2
```

A rise of 54.2 grams a day, as the report says. Now the stocks. Change in stocks was -6,090 thousand tonnes in 2021-22 and -17,540 in 2022-23: grain came out of store both years, far more in the second. Turn each into grams a person a day.

```
6,090 divided by 13,79,750 times 1,000 times 1,000 divided by 365 = 12.09 grams
17,540 divided by 13,92,329 times 1,000 times 1,000 divided by 365 = 34.51 grams
```

Drawing down stocks gave about 12 grams a day in 2021-22 and about 35 in 2022-23.

```
34.51 minus 12.09 = 22.42
```

About 22 grams of the 54-gram rise came from grain leaving store, not from a bigger harvest.

Then run the identity. The 2022-23 row misses its own total by 4,572 thousand tonnes, about 9 grams a day, and the table does not say why. The 2021-22 row misses by 101 the other way, which is less than a quarter of a gram a day.

What the answer does not establish. That anyone ate more: the table says the figures are not strictly representative of consumption, and this is availability before waste at home. That the rise will last: a stock drawdown cannot repeat forever. And about 9 grams of it rests on a row that does not add up. The honest sentence is this. "Availability rose by about 54 grams a day on the official figures. About 22 grams of that is grain drawn from stocks, and the 2022-23 figure needs checking."

7 · What Indians eat and spend on food, measured

EXERCISE 1. It shows that urban households spent more rupees a person a month on both groups than rural ones. Milk took Rs 466 against Rs 314. Vegetables took Rs 245 against Rs 203. It also shows that both groups take a smaller share of the urban budget than of the rural one. Both are true at once, because the urban budget is much larger (Rs 6,459 against Rs 3,773).

It does not show quantities. Prices differ between town and village, so more rupees need not mean more litres or kilograms.

It does not show who ate the food. These are household purchases divided by household size. It also does not show free food received through welfare schemes, which the headline figures leave out.

EXERCISE 2. Lead with what is true. "In 2023-24, rural households put about 10 per cent of their spending into drinks, snacks, processed food and bought meals. They put about 5 per cent into cereals. The government's own survey says so."

Then the two corrections. The group is not junk food. It includes a meal bought at a dhaba or a canteen. And spending is not eating. Cereals are cheap, and free ration grain is left out of these figures. So a smaller rupee share of cereals does not mean less cereal on the plate.

Give the calibrated sentence. "Indian household budgets have shifted sharply towards bought and processed food. Whether diets have shifted as much in energy terms is a separate question, and the survey's calorie estimates show total energy per person almost flat."

EXERCISE 3. A falling food share usually comes with a rising total budget, not a shrinking plate. Work out the rupees. In 2011-12 rural MPCE was Rs 1,430, and 52.90 per cent of it is about Rs 756. In 2022-23 food took Rs 1,750. Rupees on food more than doubled, at each year's prices.

So the fall in the share says the rest of the budget grew faster. It says nothing directly about food security. That needs measures of intake, of who goes short, and of prices. The report has drawn a conclusion about hunger from a ratio of rupees.

1. Part divided by whole, times 100.

```
54 divided by 450 = 0.12
0.12 times 100 = 12
```

12 per cent.

2. Points: subtract.

```
12 minus 9 = 3
```

A fall of 3 percentage points.

Per cent: divide the fall by where it started.

```
3 divided by 12 = 0.25
```

A fall of 25 per cent of the old share. Same change, two numbers.

3. Go the other way: share times whole.

```
7.5 divided by 100 = 0.075
0.075 times 2,000 = 150
```

1.

4.

```
136 divided by 3,773 is about 0.03605
0.03605 times 100 = 3.605
```

About 3.60 per cent of rural MPCE, against the printed 3.59.

The table prints rupees rounded to whole rupees. A rupee figure between 135.5 and 136.5 prints as 136. The share was worked out from the unrounded figure, so recomputing from rounded rupees can move the second decimal. A difference that small is rounding, not an error.

5.

```
687 divided by 6,459 is about 0.1064
235 divided by 6,459 is about 0.0364
```

10.64 per cent and 3.64 per cent of urban MPCE, as the factsheet prints.

The ratio needs no MPCE at all, because both shares share the same whole.

```
687 divided by 235 is about 2.92
```

Urban households spent about 2.9 times as much on the first group as on cereals.

6.

```
52.90 minus 46.38 = 6.52
6.52 divided by 52.90 = 0.123
```

A fall of 6.52 percentage points, which is about 12 per cent of the 2011-12 share.

7.

```
2,240 minus 2,206 = 34
34 divided by 2,206 is about 0.0154
```

A rise of 34 kilocalories a person a day, about 1.5 per cent of the 2011-12 figure.

The report calls the change from 2009-10 to 2023-24 slight; this one is smaller still. Table 3.14 prints no margin of error beside its figures. Without one, you cannot tell a change this small from the survey's own wobble between samples.

8.

```
1,430 times 10.75 divided by 100 = 153.7
185 minus 153.7 = 31.3
31.3 divided by 153.7 = 0.204
```

About Rs 154 a person a month in 2011-12. Rupees on cereals rose by about Rs 31, about 20 per cent, while the share fell.

It does not tell you whether more or less cereal was eaten. The rupees are at each year's prices, so some or all of the rise could be prices. And from 2022-23 grain received free through the PDS is left out of the headline figures.

9. The subtraction is right. The unit on the last line is wrong. A difference between two percentages is in percentage points.

```
10.75 minus 4.91 = 5.84 percentage points
5.84 divided by 10.75 = 0.543
```

As a per cent of the old share, the fall is about 54 per cent.

Why the wrong answer looks reasonable: both numbers are percentages, so "per cent" feels like the natural unit for their difference. Said aloud, "fell by 5.84 per cent" makes a halving sound like a small drift.

10. The base is wrong. 10.64 per cent is a share of all spending, MPCE. As a share of food spending, divide by food's share instead.

```
10.64 divided by 39.17 = 0.272
```

About 27 per cent of urban food spending. Check it from the rupees in Statement 5: Rs 687 out of Rs 2,530 on food.

```
687 divided by 2,530 is about 0.272
```

Why it looks reasonable: the table's column is headed "% share", and the row sits inside the food block. It is easy to read the share as a share of the block it sits in. Always ask "per cent of what".

11. Compute the ratio of the two shares of rural MPCE for 2023-24: 9.84 per cent and 4.99 per cent.

```
9.84 divided by 4.99 = 1.97
```

1.97 times. The sentence is right about spending.

It does not establish that rural Indians eat twice as much of that group, by weight or by energy. Cereals are cheap per kilocalorie. Free ration grain is left out of these shares. The group includes meals bought ready-made. And it says nothing about any one household, since this is an average over all rural households.

12. Two things to compute: rupees on food, and energy per person.

Rupees first. Food's share was 52.90 per cent of Rs 1,430 in 2011-12. In 2022-23 the factsheet gives Rs 1,750 on food.

```
1,430 times 52.90 divided by 100 = 756.5
1,750 divided by 756.5 = 2.31
```

Rupees on food were about 2.3 times their 2011-12 level, at each year's prices.

Energy next. Report 594 gives rural intake of 2,233 kilocalories a person a day in 2011-12 and 2,212 in 2023-24.

```
2,233 minus 2,212 = 21
```

About 21 kilocalories less, about 1 per cent. The report does not say, in the pages held here, whether its 2011-12 figure was worked out again with the 2025 conversion table, so treat this comparison as approximate. The report calls the longer trend a slight increase. Neither number supports "eating less" for the average rural person.

What the answer does not establish: whether any group, such as the poorest households, eats less. Both are averages over everyone. It does not say whether diets are better or worse, only that the budget changed shape while energy stayed about level.

8 · Built against hunger

EXERCISE 1. Answer first. The ration gives rice and wheat because the system behind it was built to end a shortage of grain, and it did.

The evidence is the state's own. The Food Corporation of India was set up in 1965 "as the country was facing major shortage of foodgrains, especially wheat". The Department still describes it as the main instrument for buying and distributing wheat, rice and coarse grains and for the buffer stock. The PDS began in the 1960s to manage grain scarcity.

The system keeps score in tonnes of grain, and by that count the shortage is over. In 2022-23 India exported about 30 million tonnes more cereal than it imported.

The law sets calorie and protein floors for meals and no ceilings. So nothing in the machinery asks about excess. Changing the basket is possible. It means changing what the Corporation buys and what the Act's schedules count, and that is a decision, not a correction.

EXERCISE 2. Net exports of cereals show that the country produces more cereal than it uses at home, in tonnes. They say nothing about who eats it.

Availability is not intake. The Economic Survey's table says its per person figure is "not strictly representative of actual level of consumption". And cereals are one food. The same table shows pulses were still a net import.

The claim measures a national store of grain and reads it as people's diets. It also treats energy from cereal as the whole of being well fed. That is exactly the measure this section says the system was built on.

EXERCISE 3. Procurement, distribution, and maintaining the buffer stock. The grains are wheat, rice and coarse grains. The Department's history gives 1965, under an Act of 1964.

9 · Minimum support price and procurement

EXERCISE 1. The Commission for Agricultural Costs and Prices (CACP) recommends. The Cabinet Committee on Economic Affairs (CCEA) approves. The National Food Security Act, 2013 defines MSP in section 2(10) and the central pool in section 2(2).

EXERCISE 2. It shows the price at which government agencies stand ready to buy each crop this season. It shows the CACP's all-India average cost of growing it. It shows how far above that cost the price was set. All three meet the 1.5 times floor. Safflower sits right on it and wheat sits far above it.

It does not show how much of each crop will be bought at that price. Wheat is bought at specified centres. Gram, a pulse, is bought only when its market price falls below MSP. It does not show what farmers actually received, or the cost on any one farm.

EXERCISE 3. Quotable: "An MSP is the price at which the government promises to buy. For most crops it buys little, so the promise reaches few farmers."

Then the detail. For wheat and paddy, agencies buy at MSP at buying centres, and they buy a great deal. Paddy was about 96 per cent of everything bought across the kharif crops from 2014-15 to 2025-26. For pulses and oilseeds, the government steps in only when the market price falls below MSP.

Calibrate. Whether a higher MSP lifts what traders pay for crops the government hardly buys is a separate question. The releases do not answer it, so do not claim it either way.

EXERCISE 4. Sugarcane has no MSP. It has a fair and remunerative price, Rs 365 a quintal for sugar season 2026-27 at a basic recovery rate of 10.25 per cent.

The government does not buy the cane. Sugar mills do, and the FRP is what they must pay.

So the note has the wrong instrument and the wrong buyer. The fix names both: “The Union Government fixes a fair and remunerative price for sugarcane, on CACP’s recommendation, which sugar mills pay.”

10 · How the state moves a price: support price, subsidy, import duty

EXERCISE 1. Since 1 January 2023, grain under the National Food Security Act has been free. The issue price is zero, so a household with a ration card pays nothing, whatever the MSP.

What an MSP rise does move is the economic cost. The pooled cost of grain at MSP is most of it: Rs 3375.29 of Rs 4173.34 a quintal of rice in the 2025-26 budget estimate. With the issue price at zero, the whole of any rise in economic cost becomes subsidy.

The replacement sentence:

> *A higher paddy MSP raises what rice costs the government, and so the food subsidy. While ration grain stays free, ration-card holders pay nothing either way.*

The sentence you replace was once closer to true. When the issue price was Rs 300 a quintal it was fixed, so it did not follow the MSP either. It could be changed only by a new decision.

EXERCISE 2. Answer first. A kilogram of rice issued free under the National Food Security Act costs the Union government about Rs 41.73 in the 2025-26 budget estimate. That is the economic cost of Rs 4173.34 a quintal in the Food Ministry’s December 2025 bulletin. The household pays nothing, so the subsidy is all of it.

Where it goes. About Rs 33.75 a kg is the price paid for the grain, the pooled cost at the minimum support price (Rs 3375.29 a quintal). About Rs 7.98 a kg is buying, storing and moving it (Rs 798.05 a quintal).

What follows for the secretary. The subsidy moves with the MSP, because the grain price is about four-fifths of the cost. Decisions on MSP are food-subsidy decisions too.

What the page does not say. It gives the government’s cost, not the value to the family, and a budget estimate, not an audited figure. Each paisa figure is rounded from rupees a quintal.

1. Margin over cost: the gap, divided by the cost, times 100.

```
150 minus 100 = 50
50 divided by 100 = 0.5
0.5 times 100 = 50
```

Fifty per cent.

One and a half times the cost:

```
80 times 1.5 = 120
120 minus 80 = 40
40 divided by 80 = 0.5
```

A price of 120, and again 50 per cent over cost. One and a half times cost is always 50 per cent over cost, whatever the cost.

2. Subsidy is full cost minus what the buyer pays.

```
60 minus 15 = 45
45 divided by 60 = 0.75
0.75 times 100 = 75
```

A subsidy of 45 a unit, 75 per cent of the cost.

When the buyer pays nothing:

```
60 minus 0 = 60
60 divided by 60 = 1
1 times 100 = 100
```

A subsidy of 60 a unit, 100 per cent of the cost. At a zero price the subsidy is the cost.

3. Write the duty as a decimal: 12.5 per cent is 0.125. Then multiply by one plus it.

```
200 times (1 plus 0.125) = 225
200 times (1 plus 0) = 200
```

225, and 200. The duty added 25, which is 12.5 per cent of 200: the duty is charged on the price before duty, not on the landed price.

4. Each price was made by multiplying, so undo it by dividing by the same number.

```
1 plus 0.15 = 1.15
230 divided by 1.15 = 200
```

The price before duty was 200. Check: 200 times 1.15 gives 230.

```
3000 divided by 1.5 = 2000
```

The cost was 2000.

The slip to avoid is taking 15 per cent of 230 and subtracting it. That gives 195.5, because 15 per cent of 230 is bigger than 15 per cent of 200. The duty was charged on 200, so 200 is the base.

5.

```
8780 minus 5438 = 3342
3342 divided by 5438 = 0.614564178
0.614564178 times 100 = 61.4564178
```

The gap is Rs 3342 a quintal. The margin over cost is about 61.5 per cent. The release prints 61, rounded to a whole number. It names moong as the kharif crop with the highest margin.

The unit matters on the first line only. Rupees a quintal divided by rupees a quintal has no unit, so the margin is a pure percentage.

6.

```
2585 minus 1239 = 1346
1346 divided by 1239 = 1.086359968
1.086359968 times 100 = 108.6359968
1346 divided by 2585 = 0.520696325
0.520696325 times 100 = 52.0696325
```

Over cost, about 109 per cent. As a share of the MSP, about 52 per cent.

The release prints 109, in its “Margin over cost” column. Wheat’s MSP is more than twice its stated cost. That is well above the rule’s floor of one and a half times.

A percentage over cost can run past 100. A share of the price cannot, because the gap is always smaller than the price.

7. First to rupees a kilogram. A quintal is 100 kg.

```
2980.06 divided by 100 = 29.8006
29.8006 minus 0 = 29.8006
```

The subsidy is about Rs 29.80 a kg, all of the economic cost.

Then the month’s 5 kg.

```
29.8006 times 5 = 149.003
```

About Rs 149 a person a month, at the 2025-26 budget-estimate cost.

The “if all 5 kg were wheat” matters. A State may issue rice, wheat or coarse grains, and rice costs more. Keep the grain named on the answer.

8.

```
4173.34 minus 830 = 3343.34
3343.34 divided by 100 = 33.4334
3343.34 divided by 4173.34 = 0.8011
0.8011 times 100 = 80.11
```

Rs 3343.34 a quintal, about Rs 33.43 a kg, and about 80.1 per cent of the economic cost, as the bulletin prints.

The same grain carries two subsidies, 100 per cent and 80.1 per cent, because it goes out at two issue prices. A subsidy figure means nothing until you know which issue price it was worked from.

9.

```
90 times (1 plus 0.10) = 99
90 times (1 plus 0.05) = 94.5
99 minus 94.5 = 4.5
4.5 divided by 99 = 0.0455
0.0455 times 100 = 4.55
```

Rs 99 a kg before, Rs 94.50 after. A fall of Rs 4.50, about 4.5 per cent of the old landed price.

Compare the illustration’s made-up Rs 100: the fall was also about 4.5 per cent. The percentage does not depend on the world price, only on the two duty rates. That is 0.05 divided by 1.10. The rupee fall does depend on the world price. The duty rates are real; the Rs 90 is not.

10. The fourth line divides by the MSP. The margin the rule promises is over cost, so the base is the cost.

```
1042 divided by 1858 = 0.560818084
0.560818084 times 100 = 56.0818084
```

About 56 per cent over cost, which is what the Cabinet’s release of 13 May 2026 prints for bajra. It is above the 50, not below.

Why the wrong answer looks reasonable. In shops and company accounts, “margin” is often a share of the selling price. So dividing by the price feels normal. The arithmetic on every line is right. Only the base is wrong, and the answer comes out small enough to fit a story about a broken promise.

11. The fourth line halves the whole landed price. Only the duty was halved. The Rs 100 before duty does not change at all.

```
100 times (1 plus 0.05) = 105
110 minus 105 = 5
```

The landed price falls from Rs 110 to Rs 105. The duty part halves, from Rs 10 to Rs 5. The price falls by about 4.5 per cent.

Why it looks reasonable: the word “halved” is true of something in the problem, and the working applies it to the nearest number in sight. The check that catches it is to ask what the price would be at a duty of nothing. It would be Rs 100. No duty change can take the price below the price before duty.

12. What to compute: the margin for common paddy from the Cabinet’s release of 13 May 2026, on its own base.

```
2441 minus 1627 = 814
814 divided by 1627 = 0.500307314
```

About 50 per cent over the stated cost. The number is real.

What it does not establish. It is over an all-India weighted average cost, so it is not any one farmer’s margin. It is a margin over one list of costs, the one in the release’s footnote. A cost that counted more would give a smaller margin. So “profit” is the speaker’s word, not the release’s.

And it is a margin on the announced price. It reaches only a farmer who sells to a procurement agency at the MSP. The section on MSP and procurement showed that a farmer may sell to the agency or in the open market. A farmer who sells in the open market gets the market price. Say instead: the announced price is about 50 per cent above the government’s average cost figure.

13.

```
4173.34 divided by 100 = 41.7334
41.7334 times 35 = 1460.669
```

About Rs 1461 a month at the 2025-26 cost, against the release’s Rs 1371. The two differ because the economic cost is set again every year. The release’s figure is about Rs 39.17 a kg (1371 divided by 35). The release does not say which year’s cost it used, and Rs 39.17 a kg matches no row of the December 2025 bulletin. Quote the year with any such figure, and when the source gives none, say so.

What it does not establish. It is what the rice costs the government, not what it is worth to the family. A family that would not have bought 35 kg of rice at the market price is not saved Rs 1461. And it says nothing about what the rice does to the family’s diet.

14. What to compute: the change in the landed price of crude palm oil, for any price before duty. Call that price 1, because the percentage does not depend on it.

```
1 times (1 plus 0.10) = 1.1
1 times (1 plus 0.05) = 1.05
1.1 minus 1.05 = 0.05
0.05 divided by 1.1 = 0.0455
```

At the port, the price of crude palm oil falls by about 4.5 per cent. That is the most the duty cut does by itself, and it is not 5.

What it does not establish. A bottle in a shop is not crude oil at a port. Refining, packing, transport and each seller's margin sit on top, and none of them fell. So even full pass-through moves the shop price by less than 4.5 per cent.

Full pass-through is not given either. The release asks industry to pass the benefit on, which shows it is not automatic. Only measured shop prices after the cut can say what happened. And this is basic duty only; other border charges are not in the sum.

11 · The National Food Security Act and the public distribution system

EXERCISE 1. The National Food Security Act, 2013, section 3(1).

A priority household gets 5 kg of grain a month for each person. An Antyodaya household gets 35 kg a month for the household.

Grain means rice, wheat or coarse grains, or a mix of them (section 2(5)).

The Central Government fixes how many people each State covers (section 9). The State picks the households (section 10).

The price of zero rests on the Union government's decision under the Pradhan Mantri Garib Kalyan Anna Yojana. Free grain began on 1 January 2023. The Cabinet extended it on 29 November 2023 for five years from 1 January 2024. The Act itself only caps the price.

EXERCISE 2. First, the Act's words. Section 3 entitles households to foodgrains. Section 2(5) defines foodgrains as rice, wheat or coarse grains. Pulses are not among them. A State cannot widen a Central Act by announcing it.

Second, the instrument behind the pulses. Look for the State's own scheme or order, and the budget line that pays for it. That is almost certainly where it sits.

Third, whether Parliament has amended the Act. That is the only way to widen it, and it would leave a trace in the Gazette and on India Code.

What you expect: a State scheme using the ration shop as its counter. That is worth knowing, because a scheme can stop when its budget line stops. The Act's grain cannot, without Parliament.

EXERCISE 3. The quotable sentence:

> *The grain is a legal right. The fact that it is free is a Cabinet decision, which runs to the end of 2028.*

Then the detail, if they want it. The 2013 food security law gives 5 kg a person a month to priority households, or 35 kg to the poorest households. It lets the government charge up to Rs 3 a kg for rice. Since January 2023 the government has charged nothing, and in November 2023 it extended that for five years.

How sure: certain on what the law says and on what the decision says, because both are published. Not sure at all on what happens after 2028. That needs a new decision nobody has yet made.

12 · School meals and anganwadi food

EXERCISE 1. 1. Section 5(1)(a). Saksham Anganwadi and Poshan 2.0, through the anganwadi. A take-home ration. 2. Section 5(1)(a). The same scheme. A morning snack and a hot cooked meal at the anganwadi. 3. Section 5(1)

(b). PM POSHAN. A hot cooked meal at school, on the upper primary norm. 4. Section 4(a). Saksham Anganwadi and Poshan 2.0. A take-home ration.

If the two-year-old is malnourished, section 6 applies as well, and the Schedule II row is the 800-kilocalorie take-home ration.

EXERCISE 2. The Act does not work that way. Section 5(1)(b) gives the meal "so as to meet the nutritional standards specified in Schedule II". Schedule II gives 450 kilocalories for lower primary. That is a standard the meal must reach. It is not a limit it must stay under. A school serving more has met the standard, not broken it.

For upper primary, Schedule II gives 700, not 450.

A school could breach a rule by serving too much only if some instrument set a ceiling. That could be an amended Schedule, a guideline or a State order. Ask to see it. If none exists, the officer's concern may be sound, but its remedy is a new norm. Nobody can enforce an old one.

EXERCISE 3. Draw four boxes, top to bottom.

Box 1, Parliament: the National Food Security Act, 2013. Section 5(1)(a) gives every child from six months to six years a free meal at the anganwadi. Schedule II sets its size. A child of three to six gets a morning snack and a hot cooked meal worth 500 kilocalories and 12 to 15 g of protein. Mark that figure "old norm, revised January 2023, new figures not held".

Box 2, the Union ministry: the Saksham Anganwadi and Poshan 2.0 guidelines of 2022, issued under sections 4, 5, 6 and 7. They say who gets a take-home ration and who a hot cooked meal. They also set at least 300 days a year of food.

Box 3, the State: it runs the scheme and pays its share of the food. That share is half in a State with a legislature, outside the north-eastern and Himalayan States. The guidelines leave the food items to the State, so the State sets the menu.

Box 4, the anganwadi centre: it cooks and serves.

The mechanism the resident should take away: the law fixes a floor of energy and protein. The ministry fixes who gets which kind of food. The State fixes what is actually on the plate. To change the plate, go to Box 3 or Box 2, not Box 4.

13 · What a ration, a meal or a take-home ration provides

EXERCISE 1. Answer first. Five kilograms of raw milled rice a month holds about 595 kilocalories and 13 grams of protein a day. That is roughly a third of what ICMR-NIN sets for a sedentary 55 kg woman. It is a little over a quarter of the figure for a sedentary 65 kg man. Wheat gives a little less energy and more protein: about 537 kilocalories and 18 grams a day.

What it does not tell her, as three short lines she can repeat.

- It is the food handed over, not the food eaten. Who at home eats it, and what it replaces, are not in the sum.
- The share is against a reference adult. Children and heavy workers need different amounts.
- The Department's own annual report calls the ration supplemental: it was never meant to meet the whole requirement.

All of what the ration gives is cereal energy, because the Act's foodgrains are cereals.

1. Multiply the grams by the content per 100 g, then divide by 100.

```
250 times 1,400 divided by 100 = 3,500
35 times 1,400 divided by 100 = 490
```

3,500 kJ and 490 kJ.

2. Kilojoules to kilocalories divides, because a kilocalorie is the bigger unit.

```
2,090 divided by 4.18 = 500
```

Kilocalories to kilojoules multiplies.

```
450 times 4.18 = 1,881
```

500 kcal and 1,881 kJ.

3. Put the kilograms into grams, then divide by the days.

```
7 times 1,000 = 7,000
7,000 divided by 30 is about 233.3
```

Now divide by the people.

```
233.3 divided by 4 = 58.3
```

About 233 g a day for the household, and about 58 g a day for each person.

4. Energy for the month, then the day, then kilocalories.

```
5,000 times 1,347 divided by 100 = 67,350
67,350 divided by 30 = 2,245
2,245 divided by 4.18 = 537.1
```

Protein the same way.

```
5,000 times 10.59 divided by 100 = 529.5
529.5 divided by 30 = 17.65
```

About 537 kcal and 17.7 g of protein a day. Against rice's 594.5 kcal and 13.2 g, wheat gives a little less energy and a good deal more protein.

5. Energy, food by food.

```
150 times 1,491 divided by 100 = 2,236.5
30 times 1,384 divided by 100 = 415.2
7.5 times 37 = 277.5
2,236.5 plus 415.2 plus 277.5 = 2,929.2
2,929.2 divided by 4.18 = 700.8
```

Protein, with the oil counted as none.

```
150 times 7.94 divided by 100 = 11.91
30 times 21.70 divided by 100 = 6.51
11.91 plus 6.51 = 18.42
```

About 701 kcal, which meets the 700 kcal norm. About 18.4 g of protein, which is 1.6 g short of the 20 g norm. The vegetables would add a little of both, and this sum cannot say how much.

6. Only the grain line changes.

```
150 times 1,347 divided by 100 = 2,020.5
2,020.5 plus 415.2 plus 277.5 = 2,713.2
2,713.2 divided by 4.18 = 649.1
```

```
150 times 10.59 divided by 100 = 15.885
15.885 plus 6.51 = 22.395
```

About 649 kcal and 22.4 g of protein. The wheat meal falls about 51 kcal short of the energy norm and clears the protein norm. The rice meal did the opposite. Which grain is served decides which norm the meal meets, with the same grams on the plate.

7. A month's worth, then half of it.

```
600 times 25 = 15,000
15,000 divided by 2 = 7,500
7,500 times 4.18 = 31,350
```

Each hand-out should carry 7,500 kcal, or 31,350 kJ.

The 600 is the Schedule II figure as the Act prints it. The anganwadi norms were revised in January 2023; the revised figures are not held, so this is the older norm.

8. Grams per person per day first, for seven people.

```
35,000 divided by 7 = 5,000
5,000 divided by 30 is about 166.7
166.7 times 1,491 divided by 100 = 2,485.5
2,485.5 divided by 4.18 = 594.6
```

Now for three.

```
35,000 divided by 3 is about 11,666.7
11,666.7 divided by 30 = 388.9
388.9 times 1,491 divided by 100 = 5,798.5
5,798.5 divided by 4.18 = 1,387.2
```

About 595 kcal a person a day for seven, the same as a priority household member gets, and about 1,387 kcal for three. The same entitlement gives more than twice as much to each person in the smaller household. A per-person figure for Antyodaya means nothing without the household size.

9. The third line multiplies kilograms by a content given per 100 grams. Five kilograms is 5,000 grams, which is 50 lots of 100 g, not 5.

```
5,000 times 1,491 divided by 100 = 74,550
74,550 divided by 30 = 2,485
2,485 divided by 4.18 = 594.5
```

About 595 kcal a day, ten times the worked answer.

Why it looks reasonable: every unit named in the working is a real one and the conversion to kilocalories is right. The slip is in the one line where the mass unit changed silently from grams to kilograms. A factor of ten hides well in a small number. Write the grams on every line.

10. The arithmetic is right on every line. What broke is the unit of people. The 35 kg is for the whole household, under the first proviso to section 3(1). The 4,161.6 kcal is the household's day, not one person's.

To get to a person you need the household's size, and the Act does not give it. For a household of seven, divide by seven.

```
4,161.6 divided by 7 = 594.5
```

About 595 kcal each, the same as a priority household member.

Why it looks reasonable: the working is careful, the units are named, and the comparison with 2,110 is a real figure. The error sits in the sentence after the working, where "a day" quietly became "each beneficiary a day". Then the comparison makes a household look like one man.

11. What to compute: the ration's energy per person per day, then its share of a stated requirement. Take the 5 kg priority entitlement as raw milled rice and a 30-day month.

```
5,000 times 1,491 divided by 100 = 74,550
74,550 divided by 30 = 2,485
2,485 divided by 4.18 = 594.5
594.5 divided by 1,660 = 0.358
594.5 divided by 2,110 = 0.282
```

About 36 per cent of a sedentary 55 kg reference woman's requirement, and 28 per cent of a sedentary 65 kg reference man's. So "more than a third" holds for one reference person and fails for another. With whole wheat it is 537.1 divided by 1,660, which is 32 per cent, and fails for both.

What this does not establish. "Every beneficiary" is wrong on its face: the requirement differs by age, sex, size and work, and an Antyodaya member's share depends on household size. The sum is the energy handed over, not eaten. It cannot see sharing within the household, cooking losses or what the ration replaces. And "needs" is a reference figure, which ICMR-NIN itself says must be adjusted for a group's actual weight and activity.

12. What to compute: the energy and protein of the 5 kg entitlement as bajra, set beside rice, per person per day on a 30-day month.

```
5,000 times 1,456 divided by 100 = 72,800
72,800 divided by 4.18 = 17,416.3
17,416.3 divided by 30 = 580.5
5,000 times 10.96 divided by 100 = 548
548 divided by 30 is about 18.3
```

About 580 kcal and 18.3 g of protein a day, against rice's 594.5 kcal and 13.2 g. The energy falls by 14 kcal a day, about 2 per cent. The protein rises by about 5 g.

```
594.5 minus 580.5 = 14
14 divided by 594.5 = 0.024
```

So the first half of the claim is true and tiny. By this arithmetic, swapping the grain changes what the ration holds far more than how much energy it holds.

What this does not establish. Nothing here says anything about obesity. The sum is the food handed over, not eaten. It cannot see whether a household eats the bajra, or sells it, or buys rice to replace it. A 14 kcal gap on paper is well

inside what cooking and household sharing can move. And the tables' averages carry their own spread: 18 kJ per 100 g for bajra, across its regions.

14 · The state as a food provider

EXERCISE 1. - The public distribution system under the National Food Security Act, 2013. The Department of Food and Public Distribution allocates the grain. States hand it out through fair price shops. The Cabinet decided on 29 November 2023 to give about 81.35 crore beneficiaries free foodgrains for five years from 1 January 2024. Or: 554.11 lakh tonnes allocated under TPDS for 2025-26, from the Department's Annual Report 2025-26. - PM POSHAN school meals, run by the Ministry of Education. The day-to-day running rests on the States and Union Territories. A PIB release of 1 April 2022 counts 11.80 crore children of classes I to VIII in 11.20 lakh schools. Or: 22.31 lakh tonnes of grain allocated for 2025-26. - Supplementary nutrition at anganwadi centres, under Mission Saksham Anganwadi and Poshan 2.0. The Ministry of Women and Child Development runs it through the States. A PIB backgrounder of 14 April 2026 counts about 14,03,170 centres and 8,95,29,425 eligible beneficiaries, as on March 2026.

Each figure keeps its own date. None of them is added to another.

EXERCISE 2. The flaw is the idea that handing out food is neutral about diet. Whatever the state hands out is part of what people eat, and the state chooses it.

Two things it has written down show that.

- The anganwadi guidelines of 2022 set the menu's rules. "Only jaggery should be used for sweetening; white sugar should not be used." Millets go in at least once a week. Those rules apply to every registered beneficiary's food.
- The Food Department's 2025-26 allocation table gives nutri-cereals "in lieu of wheat/rice" in the ration. The state picks the grain in the ration of about 80 crore people.

And the anganwadi guidelines describe the earlier programme as focused on "calorie sufficiency, neglecting quality and diversity of diets". That is the state calling its own design a diet decision.

A fairer sentence: India's food schemes are nutrition policy by design, and they were designed for hunger.

15 · The double burden, and double-duty action

EXERCISE 1. (a) Working against the other burden, on its design. It closes an energy gap by adding energy alone. A packet taken home may be shared, so older children and adults may eat some of it too. A quarter of women aged 15 to 49 are overweight or obese nationally. The figure for the women in these households is not known, and nobody should assume it is lower.

It also fails the WHO's first level, do no harm, as it stands. It also breaks the Poshan 2.0 guidelines' own rule that white sugar should not be used. Evidence that would change the answer: the extra energy reaching only wasted children, with growth measured.

1. A candidate for double duty, as a retrofit of an existing programme. Protein and diet variety rise with no rise in energy, which helps on the undernutrition side and adds nothing on the overweight side. Evidence that would change the answer: the swap costing so much that portions shrink, or the vegetable not reaching the plate.
2. Single-duty. It acts on one burden, energy supply, and does not aim at the other. Whether it works against the other burden depends on who eats the extra rice. In a household whose

members are already overweight it could; in one short of food it would not. Evidence that would change the answer: who in the household eats it, and what it replaces.

In every case the sorting is of the design. Only outcomes measured on both sides settle it.

EXERCISE 2. Quotable: "Both, in one survey. More than a third of our young children are stunted. A quarter of women of child-bearing age are overweight or obese."

Then the numbers, with their source. NFHS-5, 2019-21: 35.5 per cent of children under five stunted, 24.0 per cent of women aged 15 to 49 overweight or obese. Stunting fell and overweight rose since the round before.

Confidence, said plainly. The figures are from a very large national survey and are solid for the country as a whole. What the survey's summary cannot tell you is whether the two burdens sit in the same homes. That needs a deeper analysis than a fact sheet.

What not to say: that obesity has replaced hunger. Both are large; neither has replaced the other.

16 · The main Indian food policy tools, on one map

EXERCISE 1. Production: the support price. The Union Government announces it each season, on the advice of the Commission for Agricultural Costs and Prices. Or a crop mission, such as the oilseeds mission, run by the Department of Agriculture and Farmers Welfare with the States.

Storage: the central pool of grain. The Food Corporation of India buys, stores and moves it. Or a limit on how much grain traders may hold, set by the Government of India, as for wheat in 2025.

Distribution: the import duty on crude edible oils, a trade instrument, set by the Government of India. Or rations through ration shops, run by the Department of Food and Public Distribution with the States. Or regulated markets (mandis), run by the States' Agricultural Produce Marketing Committees.

Processing: food standards and labels. The food safety regulator, FSSAI, sets them.

Retail: goods and services tax rates, a tax instrument. The GST Council recommends them, under Article 279A of the Constitution. Labels also act here.

EXERCISE 2. The release supports "government cuts duty". It reduced the basic customs duty on crude sunflower oil to Nil and on crude soybean and crude palm oil to 5%, from 10%.

It supports "acts on oil prices". Its stated aim is "moderating domestic edible oil prices, providing relief to consumers". It also asks industry to revise its prices to distributors and its maximum retail prices.

It does not support "to protect health". The release names consumers, inflation ("mitigating inflationary pressures") and domestic refiners. It says nothing about health or nutrition. Another government text, the Poshan Maah theme of 2025, asked for a "reduction in sugar and oil consumption". The two were written for different ends. The line has put an aim into the release that its text does not state.

EXERCISE 3. Answer: the ones that hand out food. Rations under the National Food Security Act state a nutrition aim in their own text. So do school meals under PM POSHAN and anganwadi food under Poshan 2.0. Where they name a problem, it is hunger or undernutrition: for anganwadi food, wasting, underweight, stunting and anaemia.

The tools that shape the rest of the food supply state other aims. The support price is for "remunerative prices to the growers". Procurement and the buffer stock are for fair prices to farmers, affordable grain and stable prices. The edible oil duty cut is for lower prices. The oilseeds mission is for less dependence on imports, with one awareness campaign on dietary guidelines for oil.

Obesity appears only as a theme of two Poshan 2.0 awareness campaigns in 2025. No tool on the map states an aim about it.

What this does not tell you: what any of these tools does to diets. A support price with no nutrition aim may still shape what people eat. That needs evidence, not a reading of stated aims.

17 · Locating an intervention in the food system

EXERCISE 1. (a) Stage: retail, in a school canteen. Decision changed: the canteen operator's, about what to stock. Moves: availability. Upstream. NOURISHING files this under area O, standards in public institutions.

1. Stage: processing, where the pack is made. Decision changed: the manufacturer's, about what the pack must show, and so possibly about the recipe too. Moves: promotion, advertising and information, at the point of sale. Upstream. The label is on the offer itself, so it changes what every buyer sees, not what one person has been told. NOURISHING files it under its first area N, "Nutrition label standards and regulations on the use of claims and implied claims on food".
2. Stage: consumption. Decision changed: the parent's. Moves: information only, nothing on offer. On the person. Area I, "Inform people about food and nutrition through public awareness".
3. Stage: retail, where the price is paid. Decision changed: the seller's price, and so the buyer's cost. Moves: price. Upstream. Area U, "Use economic tools". Who ends up paying it, seller or buyer, is rung 2's question.

None of these answers says any of the four works. They say only where each one acts.

EXERCISE 2. The last sentence is wrong for two of the three.

The rally acts on the person. It changes what people know, and nothing on offer.

The jaggery rule changes the recipe of the anganwadi food. That decision is taken before the child eats, by whoever makes the food under the scheme. It acts upstream, on quality.

The school nutrition gardens grow food at the school. What they change depends on whether the produce goes into the meal. If it does, they act on availability on the plate, upstream. If they are only a teaching garden, they act on the person.

The plan has treated three different mechanisms as one. Split them before costing or judging them.

EXERCISE 3. People choose, but they choose from what is already there. Before anyone reaches for a packet, somebody decided what to grow and what to put in the recipe. Somebody decided what it would cost and what to put on the shelf. In India the state itself decides what goes into school meals and anganwadi food.

Quotable: "A person chooses the last step of a long chain, and most of the chain was chosen for them."

Calibrate it: this is a claim about where decisions are taken. It is not proof that changing them upstream will change weight. That needs evidence, which this section does not review.

18 · Sketching the supply chain of a packaged product

EXERCISE 1. There is no single right sketch. Judge yours against six things.

The ingredient list is copied exactly, in its printed order, not tidied or reordered.

Each of the four ingredients is traced to a crop or animal. A class name such as “milk solids” or “sugar” is traced as far as the label allows, and no further.

Each policy tool carries its figure and the date of the text that states it. A support price without its season, or a duty without its release date, has failed this test.

The brand owner is named from the “Marketed by” or “Manufactured by” line, and is not called the maker unless the pack says so.

Every link is marked, and every “checked” names its source. A sketch with no “unknown” marks is almost certainly wrong: the label does not tell you where an Indian-made product’s ingredients were grown.

The last line names prices you do not have. What did the maker pay for each ingredient? What did the distributor and the shop pay for the packet? Those are what rung 2 estimates.

EXERCISE 2. “Palm oil: imported, from the label.” The label of an Indian-made food does not declare where its oil came from; the country-of-origin clause covers foods imported into India. The claim did not come from the label. Mark it unknown.

“Wheat: grown in Punjab, bought by FCI.” Neither fact is on the pack. That the Food Corporation of India buys wheat at the support price is a fact about the tool, and can be checked. That this packet’s wheat went through it is not known. Mark the tool checked and the route unknown.

“Made by the company named after ‘Marketed by’.” The regulation requires the brand owner’s name whether or not that owner is the maker. “Marketed by” names the brand owner. The maker is unknown unless the pack says “Manufactured by”.

EXERCISE 3. “Edible vegetable oil”. The regulation has a table of class titles. For this class it says the label must “Give name of the specific edible oil”, such as mustard oil or groundnut oil. So the label should name the oil, for example “palm oil”.

“Sugar” is allowed: the table lets sucrose be listed as “Sugar”. “Milk solids” is allowed: all milk products may be listed under that title, with the source optional. Both names are classes, so your sketch can trace them only as far as sugarcane and milk.

Glossary

Every term of art this book teaches, in the plain words it gets where it is first used, and the section that teaches it.

Term	Plain words	Section
actor (in a food system)	anyone whose decision moves the food on, such as a farmer, a trader, a mill owner, a shopkeeper or the person who cooks; public bodies count too	1
allocation (of foodgrains)	grain set aside for a scheme, not grain that reached anyone; grain lifted is still not grain eaten	14
anganwadi	a government child care centre, through which the National Food Security Act's meals for young children and for pregnant women and new mothers are given	12
Antyodaya household	one of the poorest households under the National Food Security Act, entitled to 35 kg of grain a month for the whole household	11
APMC (Agricultural Produce Marketing Committee)	the committee that runs a mandi; it fixes the mandi fees and commission charges (5)	2, 5
basic customs duty	the duty on an import that the releases name as a percentage of its value before duty; the rule for the landed price uses it alone	10
brand owner	the firm whose name and address the label must declare, whether it made the food or only marketed it	3
buffer stock	grain held in reserve	8
central issue price	the price at which the Union government issues grain for the public distribution system to the States	10
central pool	the government's own stock of grain: the foodgrains procured through minimum support price operations (National Food Security Act, s. 2(2))	9
class title	one name the labelling regulation allows for a whole group of ingredients, such as "Sugar"	3
commission agent	a middleman in a mandi paid a percentage for arranging the sale	2
Commission for Agricultural Costs and Prices (CACP)	the body of experts that recommends the minimum support prices, and the sugarcane FRP	9
compound ingredient	an ingredient that is itself made of two or more ingredients	3
de novo (double-duty action)	the WHO's third level: design a new action for both burdens from the start	15

Term	Plain words	Section
do no harm (double-duty action)	the WHO's first level: check that an existing action does not raise the risk of the other forms of malnutrition	15
double burden of malnutrition	the WHO's name for undernutrition (wasting, stunting, micronutrient deficiency) together with overweight, obesity or diet-related noncommunicable diseases, in one person, one household or one population	15
double-duty action	in the WHO's words, an intervention, programme or policy with the potential to reduce the risk or burden of both undernutrition and overweight at once	15
economic cost (of grain)	the full cost to the government of buying, storing and moving the grain	10
effective customs duty	what a December 2025 government backgrounder calls the duty on crude edible oils, a different and larger number than the basic duty; no held text says what it adds	10
entitlement (food)	a set quantity of food that a person or household has a legal right to, stated as a mass over a period, such as 5 kg of grain a person a month	11
fair and remunerative price (FRP)	the price the Union Government fixes for sugarcane, on the CACP's recommendation, which sugar mills must pay for the cane they buy	9
fair price shop	a licensed ration shop, from which the grain under the National Food Security Act is collected	11
farm-gate price	the price the farmer received at the first sale	4
farmer's share of the consumer rupee	the farm-gate price divided by the retail price: at 75 per cent, Rs 75 of every Rs 100 paid at the shop reaches the farmer, who still pays for seed, labour and the trip to market out of it	4
food composition table	a table of what 100 g of each food holds; India's is the Indian Food Composition Tables 2017 (IFCT)	13
food environment	the part of the food system where a person meets it; HLPE names four elements: what is there and how near, what it costs, how it is promoted, and its quality and safety	5
food loss	food that leaves the supply chain before the shop, spoiled in the field, dropped in sorting or rotted in a store (UNEP: up to, and excluding, retail)	2
food policy tool	any means by which a government changes what is grown, stored, traded, processed, sold, served or eaten	16

Term	Plain words	Section
food supply chain	HLPE's name for the activities and actors that take food from production to consumption and to the disposal of its waste; its listed steps end at retail and markets	1
food system	everything that happens to food, and everyone who does it, from the field to the bin (HLPE's 2014 definition)	1
food waste	food, with its inedible parts such as peels and bones, removed at the shop, in food service or at home	2
hot cooked meal (HCM)	a meal eaten at the anganwadi centre, or at school, as against a take-home ration	12
Household Consumption Expenditure Survey (HCES)	India's survey of household spending, run by the Ministry of Statistics and Programme Implementation (MoSPI)	7
import dependency ratio (IDR)	the FAO's ratio: imports divided by production plus imports minus exports, times 100	6
kharif, rabi	the names the MSP releases use for India's two main crop seasons; paddy is a kharif crop and wheat a rabi crop	9
kirana	a small neighbourhood grocery	5
landed price	the price of an import at the port after duty: the price before duty times one plus the duty rate as a decimal	10
locate (an intervention)	state three things: the stage at which it acts, the actor whose decision it changes, and the element of the food environment it moves	17
mandi	a regulated wholesale market for farm produce, run under state law	2
margin	what is left of an actor's mark-up after its own costs of handling the unit	4
margin over cost	the release's term: the minimum support price minus the cost, divided by the cost, times 100; not a trader's margin	9
mark-up	an actor's selling price minus its buying price; it pays for that actor's handling costs, and what is left is its margin	4
minimum support price (MSP)	the assured price the Central Government announces, at which foodgrains are procured from farmers for the central pool; a price at which the government will buy, not a price every farmer gets	9
monthly per capita consumption expenditure (MPCE)	a household's spending in a month, divided by the number of people in it	7

Term	Plain words	Section
net availability (of foodgrains)	gross production less seed, feed and wastage, less exports, plus imports, less the change in stocks: what was there to be eaten, not what was eaten	6
net imports	imports minus exports; a minus sign means more went out than came in	6
net production	the harvest less what was kept for seed, fed to animals or wasted before sale	6
nutrition transition	Popkin and colleagues' name for a shift in the world's diets towards processed food, edible oils and sweet drinks	7
on the person (of an intervention)	changing only the eater's own decision, made from an offer left as it was: at most it adds information	17
overweight (child under five)	weight-for-height more than two standard deviations above the WHO growth standard (the NFHS-5 cut-off)	15
price wedge	a gap that a public decision opens between two prices of the same food	10
priority household	a household under the National Food Security Act whose members are entitled to 5 kg of grain a month each	11
procurement	the state buying grain from farmers	8
quintal	100 kg	2
retail price	the price paid for a unit of food at the shop	4
retrofit (double-duty action)	the WHO's second level: change an existing action so that it also acts on the other burden	15
self-sufficiency ratio (SSR)	the FAO's ratio: gross production divided by production plus imports minus exports, times 100	6
share of MPCE	a group's MPCE divided by total MPCE, times 100: a share of rupees spent, not of food eaten	7
single-duty change	this book's reading word, not an official one: a change that acts on one burden and does not aim at the other	15
stage (of a food system)	one of this book's eight kinds of activity: production, storage, processing, distribution, retail, preparation, consumption and waste; this book's reading of HLPE, not HLPE's own list	1
stock limit	a limit on how much of a grain traders may hold	16
stunted	of a child under five, height-for-age more than two standard deviations below the WHO growth standard	15
subsidy (on ration grain)	the economic cost minus the central issue price: what the government pays that the household does not	10

Term	Plain words	Section
supply (of a food, for use within a country)	over one stated period, production plus imports minus exports, minus the rise in stocks (or plus the fall)	6
supply-chain sketch	a written map of one packaged food, from its ingredients' crops to the shop, with every link marked checked, seen or unknown	18
take-home ration (THR)	a prepared food handed out at the anganwadi to be eaten at home; not raw grain	12
underweight (child under five)	weight-for-age more than two standard deviations below the WHO growth standard	15
upstream (of an intervention)	changing a decision taken before the person chooses: a crop, a recipe, a price, a shelf, a ration basket	17
wasted	of a child under five, weight-for-height more than two standard deviations below the WHO growth standard	15
working against the other burden	this book's reading word, not an official one: a change that acts on one burden and, by its design, raises the risk of the other	15

The series: all 196 books

In build order: Book 0 first, then every Introductory rung, then every Intermediate rung, and so on; within a level, a subject comes after the subjects it depends on. "done" means that book's version 1 is finished. This is Book 4.

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OBESITY EXPERTISE · BOOK 4

Food systems, value chains and Indian food policy · Rung 1

A short book on the food system for readers who work on obesity. It follows food from production through storage, processing, distribution and retail to the plate and the waste bin; asks who decides what is available, at what price and where; and sets out the Indian food policy instruments, from the public distribution system to school meals, which were built to end hunger rather than excess.

Book 4 of the series' 196 books, free to read at drharshmaheshwari.com.



Dr. Harsh Maheshwari
MD Community Medicine Resident, AIIMS Raipur
contact@drharshmaheshwari.com
ORCID 0000-0001-8848-1918
drharshmaheshwari.com
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