

The goat that lost 62% of its value while its price fell 18%

A day's casual labour bought 4.82 kg of maize at the 2023 harvest and 2.48 kg at the 2024 lean peak. A goat bought 69.4 kg and then 26.7. Neither the wage series nor the goat series shows that, because it is a ratio.

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Lesson 6 of 8

Food Security Analysis and IPC — The market is an outcome too

What this lesson covers

- A price is a number about a market, not about a household
- What the wage series alone would have told you
- What the goat series alone would have told you
- The three ratios worth computing
- Two warnings
- Report the ratio, not just the prices
- What comes next

A price is a number about a market, not about a household

- Terms of trade are that ratio — expressed in the units the household thinks in

A price is a number about a market, not about a household — In Python

```
import pandas as pd

prices = pd.read_csv("market-prices-2024.v1.csv")
clean = prices[(prices["price_htg"] >= 10) &
               ~((prices["commodity"] == "maize") &
                 (prices["market_id"] == "MK005"))]

series = clean.pivot_table(index="period", columns="commodity",
                           values="price_htg", aggfunc="median")

series["wage_to_maize"] = series["daily-wage-casual-labour"] / series["maize"]
series["goat_to_maize"] = series["goat"] / series["maize"]
print(series[["maize", "daily-wage-casual-labour", "goat",
              "wage_to_maize", "goat_to_maize"]].round(2))
```

A price is a number about a market, not about a household — In R

```
library(dplyr)

prices |>
  filter(price_htg >= 10, !(commodity == "maize" & market_id == "MK005")) |>
  summarise(price = median(price_htg), .by = c(period, commodity)) |>
  tidyr::pivot_wider(names_from = commodity, values_from = price) |>
  mutate(wage_to_maize = `daily-wage-casual-labour` / maize,
         goat_to_maize = goat / maize)
```

A price is a number about a market, not about a household

Month	Maize	Wage	Goat	Wage → kg maize	Goat → kg maize
Dec 2023	74.9	361.3	5,195	4.82	69.4
Jul 2023	130.1	368.9	4,332	2.84	33.3
Dec 2024	81.4	388.5	5,900	4.77	72.5
Jul 2024	159.3	395.6	4,254	2.48	26.7

What the wage series alone would have told you

- The daily wage rose 10% over two years — from 361 to 396 gourdes
- A day's work bought 4.82 kg of maize at the 2023 harvest and 2.48 kg at the 2024 lean peak — a 49% fall in purchasing. . .

What the wage series alone would have told you — In Python

```
wage = series["wage_to_maize"]
print(f"-wage rose {series['daily-wage-casual-labour']['2024-07'] / series['daily-wage-casual-  
labour']['2023-12'] - 1:+.1%}")
print(f"purchasing power fell {wage['2024-07'] / wage['2023-12'] - 1:+.1%}")
```

What the wage series alone would have told you — In R

One number goes up, the other goes down, and they are the same households.

What the wage series alone would have told you

- This is the single most useful ratio in a food security analysis of a labour-dependent population — and it takes two...

What the goat series alone would have told you — In Python

```
goat = series["goat_to_maize"]
print(f"goat price change: "
      f"{series['goat']['2024-07'] / series['goat']['2023-12'] - 1:+.1%}")
print(f"goat terms of trade: {goat['2024-07'] / goat['2023-12'] - 1:+.1%}")
```

What the goat series alone would have told you — In R

-18% and -62%. The second is the one the household experiences.

What the goat series alone would have told you

- The goat price fell 18%. The goat's purchasing power fell 62% — A herder who sold one goat for 69 kg of maize in...
- Neither series shows that — The maize series shows a price rise; the goat series shows a modest price fall; only the...

The three ratios worth computing

Ratio	Whose access it describes	Read it against
Wage to staple	Casual labourers, 26.7% of these households	Kilograms per day worked
Livestock to staple	Livestock-dependent households, 7.8% here	Kilograms per animal
Cash-crop to staple	Farmers selling one crop and buying another, 29.5% subsistence here	Kilograms per kilogram

The three ratios worth computing — In Python

```
livihoods = pd.read_csv("food-security-survey-2024.v1.csv")["main_livihood"]  
print(livihoods.value_counts(normalize=True).round(3))
```

The three ratios worth computing — In R

```
survey |> count(main_livelihood) |> mutate(share = n / sum(n)) |> arrange(-share)
```

The three ratios worth computing

- Compute the ratio that matches the livelihood you are analysing — A wage-to-cereal figure describes nothing about a...

Two warnings

- Terms of trade are not a welfare measure — They say how much food a unit of income or of assets buys
- The denominator has to be the staple people actually eat — Rice is imported here and moves with the exchange rate...

Two warnings — In Python

```
series["wage_to_rice"] = (series["daily-wage-casual-labour"]  
                          / series["rice-imported"])  
print(series[["wage_to_maize", "wage_to_rice"]].loc[  
      ["2023-12", "2023-07", "2024-12", "2024-07"]].round(2))
```

Two warnings — In R

Two staples, two stories. Say which one the population eats.

Report the ratio, not just the prices — Example

Terms of trade, median across a balanced panel of 10 markets

	Dec 2023	Jul 2024	Change
Maize, HTG/kg	74.9	159.3	+113%
Casual wage, HTG/day	361.3	395.6	+10%
Goat, HTG/head	5,195.1	4,254.4	-18%
Wage buys, kg maize	4.82	2.48	-49%
Goat buys, kg maize	69.4	26.7	-62%

Terms of trade are computed on maize, the local staple. On imported rice the wage ratio falls 29% over the same period rather than 49%. 34.5% of surveyed households depend on casual labour or livestock as their main livelihood; a further 29.5% on subsistence farming.

Report the ratio, not just the prices

- The last line is what turns a market table into an analysis — The ratio matters in proportion to how many households. . .

What comes next

- You now have four household indicators and two market ratios, from two independent sources, all pointing at the same lean season.

Read the full lesson, with runnable code

`https:`

`//data-analysis.cassion.dev/courses/food-security-ipc/fs-06-terms-of-trade`