



Data Article

Monthly basket costs for healthy and sustainable diets in Italian provinces: A seasonal dataset by demographic profile (2021–2024)



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ABSTRACT

This dataset provides seasonally estimated monthly costs of healthy and sustainable diets for five demographic profiles: infants, adolescents, adult women, adult men, and the elderly. The estimates cover all Italian provinces across 12 seasonal periods from 2021 to 2024. Food baskets are based on nationally recommended nutritional guidelines that are specific to age, gender, and season. They include 167 food items, ranging from fresh produce to processed foods. Costs are calculated by matching these dietary requirements with official provincial-level food price data from the Osservatorio Prezzi e Tariffe. Missing prices in provinces not covered by the survey are imputed using a spatial model that accounts for neighboring prices, local income levels, and seasonal variation. For each basket, the dataset reports minimum, average, and maximum monthly costs, depending on the variation in item-level prices. This dataset allows for spatial and temporal analysis of the affordability of healthy diets and supports applications in public health, food policy, and targeted support for vulnerable populations across Italian provinces.

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Specifications Table

Subject	Dietary cost estimation, Food price imputation, Healthy and Sustainable Diets (HSD), Regional disparities in food affordability, Italy.
Specific subject area	
Type of data	Table of numeric data in Excel format
Data collection	Data were compiled from two sources: (1) official food price records (167 items) from the Italian Ministry of Enterprises and Made in Italy (2021–2024) ¹ , and (2) nutritional intake recommendations for five demographic groups from national dietary guidelines (LARN and CREA). Imputations were applied to estimate missing or unavailable data for provinces and seasons, by using auxiliary data from the Italian Tax Agency (2021–2022).
Data source location	Italian NUTS 3 provinces
Data accessibility	Repository name: Mendeley Data Data identification number: 10.17632/srzwwrhzm6.1 Direct URL to data: https://data.mendeley.com/datasets/srzwwrhzm6/2
Related research article	None

¹ Data retrieved from the official price monitoring system of the Italian Ministry of Enterprises and Made in Italy. Available at: <https://osservaprezzi.mise.gov.it/prezzi/livelli/beni-e-servizi-di-largo-consumo/archivio-rilevazioni-beni-e-servizi-di-largo-consumo>.

1. Value of the Data

- This dataset provides seasonally estimates of monthly food basket costs required to sustain a Mediterranean-healthy diet for different demographic groups (infants, adolescents, adult men, adult women, and the elderly) across Italian provinces between 2021 and 2024.
- The food basket composition is based on nutritionist-designed dietary recommendations specific to gender and age, and covers 167 food items including vegetables, fruits, fishery products, and processed foods, offering a rich and policy-relevant basis for dietary cost assessment.
- Provincial-level food price data (397,505 observations) were sourced from the Osservatorio Prezzi e Tariffe, an official database made available by MIMIT-ISTAT, and the missing values for unsurveyed provinces were addressed through an imputation strategy, offering a methodological reference for regional data gap handling.
- This dataset introduces both temporal and local (i.e. NUTS 3) dimensions, allowing for a refined evaluation of the affordability of healthy diets across space and time.
- The dataset can be used to investigate spatial and temporal price heterogeneity in diet-related economic burdens, to assess the feasibility of healthy eating among vulnerable populations, and to inform local, regional or national food security policies in Italy.
- Researchers in public health, nutrition, economics, and food policy may also use the data to study the local relevance and affordability of healthy diets, or to examine how alternative dietary patterns might affect malnutrition risks and cost burdens for Italian households.

2. Background

Promoting sustainable and healthy diets is widely recognized as a priority for improving public health and reducing the environmental impact of food systems. These diets provide adequate nutrition while minimizing harm to natural resources and biodiversity, and are essential for addressing challenges such as food insecurity, climate change, and health inequalities [1]. However,

their adoption is often limited by economic constraints, access issues, and sociocultural barriers, especially among vulnerable populations [2].

To support effective policy and interventions, high-quality, detailed, and geographically disaggregated data on food prices and diet costs are crucial. The dataset presented here offers systematically collected food price data across Italian provinces, allowing for robust analysis of regional disparities, seasonal patterns, and trends in the affordability of sustainable diets. Such data support applications ranging from food policy design and social protection to research on diet, health, and sustainability.

Food price data were collected via the Osservatorio Prezzi e Tariffe, covering 167 items from August 2021 to March 2024, and were matched with age- and gender-specific dietary recommendations. Missing values were addressed through a spatial-temporal imputation method, ensuring broad geographic completeness.

3. Data Description

This dataset reports the estimated monthly cost (in euros) of adhering to HSDs for five demographic groups—adult males, adult females, elderly people, adolescents, and infants—across Italian provinces over 12 seasonal time points between 2021 and 2024. The basket cost for each group is expressed as three values: the minimum, average, and maximum cost, based on price variation across food items. The minimum, average, and maximum prices used to calculate the cost of the baskets are the only values available from the Osservatorio Prezzi e Tariffe public database. The estimates are derived from age- and gender-specific dietary recommendations combined with provincial-level food prices.

Each row of the dataset corresponds to a single Italian province in a given season and year. The dataset includes 107 provinces and covers the following seasonal observations: Summer and Autumn in 2021, all four seasons in both 2022 and 2023, and Winter and Spring in 2024, resulting in a total of 12 seasonal periods.

The dataset contains 22 variables, described as [Table 1](#):

The basket costs are calculated by matching nutritional requirements, as defined in national guidelines (LARN and CREA) [3], with food price data collected by the Italian Ministry of En-

Table 1
Description of variables.

Variable Name	Description	Unit	Notes
year	Year of observation	—	Values range from 2021 to 2024
season	Season of the year	—	Spring, Summer, Autumn, or Winter
den_prov	Full name of the province	—	In Italian
cod_reg	Regional code	—	ISTAT standard regional identifier
cod_prov	Province code	—	ISTAT standard provincial identifier
abbreviation	Province abbreviation	—	Two-letter code (e.g., RM for Rome)
f_min / f_avg / f_max	Monthly basket cost for adult females	€ / person / month	Minimum, average, and maximum values
m_min / m_avg / m_max	Monthly basket cost for adult males	€ / person / month	—
e_min / e_avg / e_max	Monthly basket cost for elderly people	€ / person / month	—
a_min / a_avg / a_max	Monthly basket cost for adolescents	€ / person / month	—
i_min / i_avg / i_max	Monthly basket cost for infants	€ / person / month	—
survey	Indicator for observation being surveyed or imputed	—	= 1 if from survey data, = 0 if from imputation

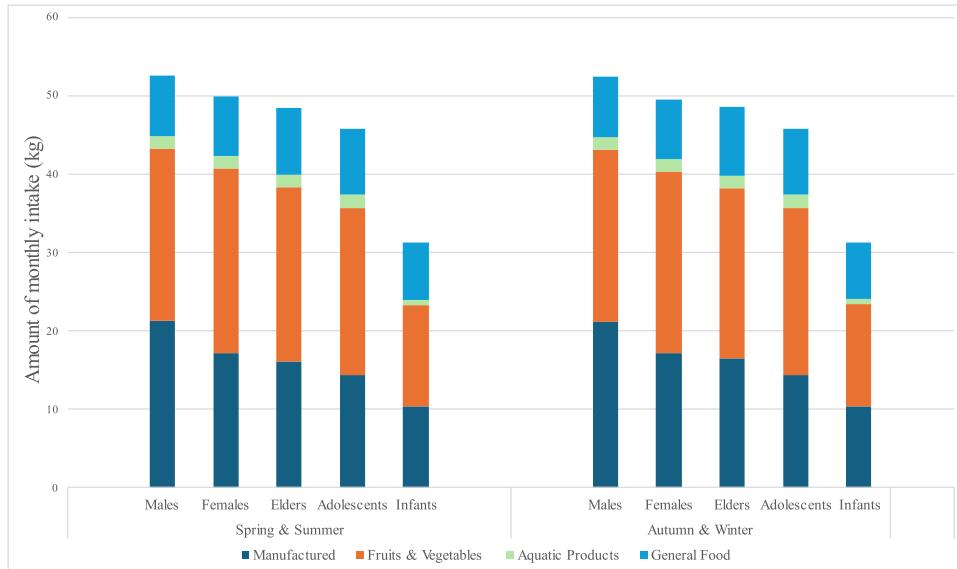


Fig. 1. Monthly recommended intake by demographic group and season.

Table 2

Summary statistics of monthly basket costs (€/person) by demographic group and cost level.

Demographic group	Cost level	Mean	S.D.	Min.	Median	Max.
Adult females	Minimum	89.937	14.549	62.917	89.841	119.36
	Average	170.23	28.814	114.25	164.13	231.38
	Maximum	298.13	55.419	194.36	284.27	449.00
Adult males	Minimum	90.034	7.9788	69.225	90.480	110.90
	Average	169.89	18.016	125.21	168.67	219.44
	Maximum	295.72	36.086	211.94	295.69	398.50
Elders	Minimum	84.162	13.551	57.941	84.050	112.89
	Average	159.88	25.987	107.43	154.75	222.87
	Maximum	285.09	47.466	187.85	277.11	427.93
Adolescents	Minimum	52.700	13.723	33.668	50.553	77.813
	Average	96.893	26.198	56.754	90.841	150.76
	Maximum	162.10	46.518	93.479	151.93	268.56
Infants	Minimum	34.671	5.3335	24.838	34.212	44.952
	Average	64.420	10.121	42.871	63.314	88.230
	Maximum	107.36	16.193	75.434	103.90	149.17

terprises and Made in Italy (Osservatorio Prezzi e Tariffe). Nutritional requirements vary by age, gender, and season, with tailored intake quantities specified for each demographic group. **Fig. 1** presents the monthly recommended intake (in kg) by food category, across five population profiles and two seasonal periods. The detailed monthly dietary compositions recommended by nutrition scientists for each demographic group are reported by [Tables A. 1–Table A. 5](#) in Appendices.

Where provincial data were missing, temporal and spatial imputation methods were used to estimate values based on neighboring provinces and historical trends. **Table 2** summarizes the distribution of monthly basket costs across five demographic groups (adult females, adult males, elderly people, adolescents, and infants) and three cost scenarios (minimum, average, and maximum). The statistics are calculated over 1284 observations (107 provinces × 12 seasons) and are reported in euros per person per month.

4. Experimental Design, Materials and Methods

This dataset combines two primary sources to estimate the monthly cost of maintaining HSDs for five demographic groups across Italian provinces. The first is a set of nutritional recommendations differentiated by gender, age, and season, based on national dietary guidelines (CREA and LARN). The second is a set of provincial-level food prices for 167 items representative of the Mediterranean diet, obtained from the Osservatorio Prezzi e Tariffe, a public monitoring system managed by the Ministry of Enterprises and Made in Italy. To compute the basket cost, group-specific dietary quantities were matched with corresponding food prices by province, season, and year. For each food category, representative unit prices were derived by aggregating the item-level data under three pricing scenarios—minimum, average, and maximum. These values were then used to estimate the monthly cost of a nutritionally adequate diet for each demographic group.

A key challenge was the incomplete coverage of price data. Some food items were missing for certain time points even within the 64 surveyed provinces, while others were unavailable for unsurveyed provinces altogether. To illustrate the extent of these gaps, [Table A. 6](#) reports the descriptive statistics of surveyed minimum-level food prices across major food categories and subcategories. It shows heterogeneity in both prices levels and missing rates, with higher variability observed among processed and animal-source foods, and a higher share of missing values among fruits and vegetables due to seasonal availability.

To address this, a two-step imputation procedure was implemented, combining temporal and spatial methods to reconstruct a complete dataset covering all 107 Italian provinces. This enabled consistent estimation of basket costs across the national territory.

4.1. Imputation of food prices within and across provinces

We implemented a two-step imputation strategy to address missing values in the food price dataset. The first step addressed gaps within the 64 surveyed provinces, where certain food items were occasionally missing for specific months or seasons due to incomplete reporting or temporary unavailability. These gaps were filled using temporal extrapolation techniques that exploit the spatio-temporal autocorrelation structure of observed prices.

After completing the within-province imputation, the second step estimated food prices for the remaining 43 provinces not included in the official survey. For these unsurveyed provinces, spatial imputation was performed using price patterns from geographically adjacent surveyed provinces.

4.2. Imputation for missing values in surveyed provinces

To address missing values within the 64 surveyed provinces, we applied a two-step imputation procedure focused on reconstructing seasonal average prices for each food item. First, normalized average prices were computed using min-max scaling and imputed using Principal Component Analysis via the NIPALS algorithm, which is suitable for datasets with uneven missingness across variables. This step exploited spatio-temporal correlations in price patterns across items, provinces, and seasons.

Second, the corresponding minimum and maximum prices for each item were imputed using Random Forest regressions (RF), trained on the normalized average prices. This approach keeps that the imputed bounds remain within realistic ranges derived from observed values and accounts for complex inter-item and inter-province dependencies. The result is a completed dataset of minimum, average, and maximum seasonal prices for all food items in the surveyed provinces.

The full sequence of the imputation procedure applied to the surveyed provinces is summarized in [Table 3](#).

Table 3

Workflow for completing missing price data in surveyed provinces.

Step	Operation	Purpose
1	Classify variables by missing rate into three groups ($\leq 50\%$, $50\text{--}75\%$, $> 75\%$)	Separate more complete variables to serve as stable predictors
2	Initial imputation of Group 1, and creation of raw Group 2 and 3 using NIPALS	Get initial guesses for missing values across all groups
3	Impute bounds for Group 1 using RF on Group 1 + raw Group 2 & 3	Estimate price bounds (min/max) for complete variables using RF
4	Refine Group 2 using NIPALS (with Group 1 complete)	Improve estimates for moderately missing variables using better predictors
5	Impute bounds for Group 2 using RF on Group 1 + Group 2 + raw Group 3	Estimate bounds for moderately missing variables using updated data
6	Refine Group 3 using NIPALS (with Group 1 & 2 complete)	Refine heavily missing variables after others are imputed
7	Impute bounds for Group 3 using RF on Group 1 + Group 2 + Group 3	Estimate bounds for heavily missing variables using all imputed data
8	Rescale normalized seasonal prices back to actual values	Convert normalized prices back to real scale using imputed bounds

4.3. Imputation for unsurveyed provinces

To estimate food prices for the 43 provinces not covered by the official survey, we used a spatial regression approach based on data from the 64 surveyed provinces. For each food item, province, and season, prices were predicted using a separate linear regression model fitted specifically for that item. Each model incorporated: (i) the average price of the same item in surveyed neighboring provinces (if any) during the same season, (ii) local income levels, which are proxied by average annual after-tax income per capita from official tax data, and (iii) seasonal effects. Survey year dummies were also included to control for broader temporal shocks.

This specification was selected after comparing multiple candidate models and was found to provide robust and interpretable estimates. To account for variation in spatial data availability, we ran the imputation in two rounds: first for unsurveyed provinces with at least one neighboring surveyed province, and then for the remaining provinces using prices imputed in the first round as new predictors.

4.4. Computation of the basket cost for different demographic groups

The monthly basket cost for each demographic group is obtained by combining food prices with group-specific dietary requirements across provinces and seasons. For each population profile, we calculate the total cost of meeting the recommended dietary quantities by applying representative food prices under three pricing scenarios to each food category.

Formally, for each demographic group p , province j , and season t , the monthly basket cost is given by:

$$C_{pjt}^r = \sum_g \pi_{gjt}^r \times Q_{gpt}$$

where $r \in \{\text{min, average, max}\}$ indicates the price scenario. π_{gjt}^r is the representative price of food category g in province j and season t under scenario r . And Q_{gpt} is the recommended monthly consumption quantity of category g for group p in season t . This calculation yields three price-specific estimates of monthly basket cost for each demographic group across 107 provinces and 12 seasons.

The quantities Q_{gpt} were derived from the official Italian nutritional reference values and the national dietary guidelines “Linee guida per una sana alimentazione” (CREA, 2018). These guidelines provide age- and gender-specific recommendations for daily energy and nutrient intake, which were translated into equivalent monthly quantities (kg or liters per person) by food group.

The conversion followed nutritionist-defined weekly meal plans ensuring compliance with both macronutrient balance and food diversity consistent with the Mediterranean Diet model.

Seasonal differentiation (*t*) does not imply variation in human nutritional requirements but reflects the rotation of seasonally available foods, e.g., strawberries in spring versus apples in winter, used to maintain equivalent nutritional profiles across periods. Detailed nutritional compositions and target quantities for each demographic group are reported in the Appendices (Table A. 1 to Table A. 5).

Limitations

The original price data from the Osservatorio Prezzi e Tariffe are based on sampled retail outlets, with survey weights documented. While our imputation strategy addresses missing values and expands coverage to unsurveyed provinces, the resulting estimates may still reflect residual sampling and modelling uncertainty. Additionally, standardized nutritional requirements may not fully reflect individual dietary variations or regional consumption patterns.

Ethics Statement

The authors have read and followed the ethical requirements for publication in Data in Brief confirming that the current work does not involve human subjects, animal experiments, or any data collected from social media platforms.

CRediT Author Statement

Ilaria Benedetti: Conceptualization, Funding acquisition, Investigation, Project administration, Resources, Supervision, Validation, Writing – review & editing. **Haoran Yang:** Data curation, Formal analysis, Methodology, Software, Visualization, Writing – original draft. **Stefano Marchetti:** Investigation, Methodology, Supervision, Validation, Writing – review & editing.

Data Availability

[Monthly Basket Costs for Healthy and Sustainable Diets in Italian Provinces \(2021–2024\) \(Original data\)](#) (Mendeley Data)

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendices

Table A.1

Details of suggested monthly diet for adult females by season (in gram).

Category	Sub-category	Product	Spring-summer	Autumn-winter	
Processed food	Dairy products	Crescenza cheese	400	400	
		Fresh mozzarella	400	400	
		Milk	3000	3000	
		Parmigiano Reggiano	120	120	
		Yogurt	5600	5600	
	Oil & fats	Butter	80	80	
		Extra virgin olive oil	940	960	
	Frozen desserts	Ice cream	480	480	
	Cocoa, Coffee & Confectionery	Coffee	1120	1120	
	Cereals & Bakery	Biscuits / Cookies	360	360	
Fruits & Vegetables		Oat flakes	480	480	
		Bread	3920	3920	
		Durum wheat pasta	1760	1760	
		Peeled tomatoes	400	400	
		Rice	240	240	
Fruits & Vegetables	Strawberries, kiwis or peaches	12,000	0		
	Nuts (in shell)	840	840		
	Apples, pears or oranges	400	11,200		
	Dried chickpeas	640	640		
	Onions	400	400		
	Green beans	1600	0		
	Lettuce / Salad greens	2400	2000		
	Eggplants	400	0		
	Potatoes	720	720		
	Bell peppers	1600	0		
	Frozen peas	1440	1440		
	Salad tomatoes	800	0		
	Raw cucumbers, carrots, radishes	2400	2800		
	Zucchini / Courgettes	800	0		
Fish & Seafood	Fish & Seafood	Artichokes	0	1600	
		Cauliflower	0	800	
		Chicory	0	1600	
		Endive	0	800	
		Radicchio	0	1200	
General food	Meat & meat products	Fresh anchovies	600	600	
		Mackerels	600	600	
		Clams and mussels	400	400	
	Eggs	Pork steak	400	400	
		Chicken or turkey	1200	1200	
		Eggs	960	960	

Table A.2

Details of suggested monthly diet for adult males by season (in gram).

Category	Sub-category	Product	Spring-summer	Autumn-winter
Processed food	Dairy products	Crescenza cheese	400	400
		Fresh mozzarella	400	400
		Milk	3000	3000
		Parmigiano Reggiano	120	120
		Yogurt	5600	5600
	Oil & fats	Butter	80	80
		Extra virgin olive oil	1120	960
	Frozen desserts	Ice cream	480	480
	Cocoa, Coffee &	Coffee	1120	1120
	Confectionery			
	Cereals & Bakery	Biscuits / Cookies	720	720
		Oat flakes	960	960
		Bread	7040	7040
		Durum wheat pasta	1760	1760
Fruits & Vegetables	Fruits & Vegetables	Peeled tomatoes	400	400
		Rice	240	240
		Strawberries, kiwis or peaches	4800	0
		Nuts (in shell)	840	840
		Apples, pears or oranges	5200	10,000
		Dried chickpeas	640	640
		Onions	400	400
		Green beans	1600	0
		Lettuce / Salad greens	2400	2000
		Eggplants	400	0
		Potatoes	1200	1200
		Bell peppers	1600	0
		Frozen peas	1440	1440
		Salad tomatoes	800	0
Fish & Seafood	Fish & Seafood	Raw cucumbers, carrots, radishes	2800	0
		Zucchinis / Courgettes	800	0
		Artichokes	0	1200
		Cauliflower	0	800
		Chicory	0	1600
General food	Meat & meat products	Endive	0	800
		Radicchio	0	1200
		Fresh anchovies	600	600
		Mackerels	600	600
		Clams and mussels	400	400
	Eggs	Pork steak	400	400
		Chicken or turkey	1200	1200
		Eggs	960	960

Table A.3

Details of suggested monthly diet for elders by season (in gram).

Category	Sub-category	Product	Spring-summer	Autumn-winter	
Processed food	Dairy products	Crescenza cheese	400	400	
		Fresh mozzarella	400	400	
		Milk	4200	4200	
		Parmigiano Reggiano	240	240	
		Yogurt	5600	5600	
	Oil & fats	Butter	1120	1120	
		Extra virgin olive oil	960	960	
	Frozen desserts	Ice cream	480	480	
	Cereals & Bakery	Biscuits / Cookies	840	840	
		Oat flakes	0	400	
Fruits & Vegetables		Bread	3720	3720	
		Durum wheat pasta	1400	1400	
		Peeled tomatoes	400	400	
		Rice	200	200	
Fruits & Vegetables	Strawberries, kiwis or peaches	10,800	0		
	Nuts (in shell)	280	280		
	Apples, pears or oranges	0	8400		
	Dried chickpeas	0	2400		
	Onions	480	800		
	Green beans	400	1600		
	Lettuce / Salad greens	1600	400		
	Eggplants	1200	1200		
	Potatoes	1600	0		
	Bell peppers	720	720		
	Frozen peas	1600	0		
	Salad tomatoes	1200	1200		
	Zucchini / Courgettes	2400	0		
	Artichokes	0	1600		
	Cauliflower	0	800		
	Chicory	0	640		
	Endive	0	1600		
	Radicchio	0	2400		
	Carrots	800	0		
Fish & Seafood	Fish & Seafood	Fresh anchovies	600	600	
		Mackerels	600	600	
		Clams and mussels	400	400	
General food	Meat & meat products	Pork steak	400	400	
		Chicken or turkey	1200	1200	
	Eggs	Eggs	960	960	

Table A.4

Details of suggested monthly diet for adolescents by season (in gram).

Category	Sub-category	Product	Spring-summer	Autumn-winter
Processed food	Dairy products	Crescenza cheese	400	200
		Fresh mozzarella	400	200
		Milk	5600	5600
		Parmigiano Reggiano	200	80
		Yogurt	3000	2400
	Oil & fats Frozen desserts Cereals & Bakery	Extra virgin olive oil	980	860
		Ice cream	480	400
		Biscuits / Cookies	640	480
		Bread	4400	2080
		Durum wheat pasta	2160	2600
Fruits & Vegetables	Fruits & Vegetables	Peeled tomatoes	400	400
		Rice	280	200
		Breakfast cereals	480	360
		Nuts (in shell)	560	0
		Seasonal fruits (spring-summer) ¹	10,800	0
		Seasonal fruits (autumn-winter) ²	0	6400
		Dried chickpeas	320	160
		Lettuce / Salad greens	1600	400
		Potatoes	800	400
		Frozen peas	800	400
Fish & Seafood	Fish & Seafood	Seasonal vegetables (spring-summer) ³	8000	0
		Seasonal vegetables (autumn-winter) ⁴	0	5760
		Fresh anchovies	600	240
		Mackerels	600	240
General food	Meat & meat products	Cod	600	240
		Pork steak	400	200
		Chicken or turkey	800	400
		Eggs	480	480

Notes: ¹ Seasonal fruits (spring-summer) include apples, pears, oranges, mandarins, strawberries, kiwis, and peaches. ² Seasonal fruits (autumn-winter) include apples, pears, oranges, and mandarins. ³ Seasonal vegetables (spring-summer) include eggplants, bell peppers, green beans, cucumbers, carrots, and radishes. ⁴ Seasonal vegetables (autumn-winter) include cauliflower, chicories, artichokes, endive, radicchio, fennel, carrots, and radishes.

Table A.5

Details of suggested monthly diet for babies by season (in gram).

Category	Sub-category	Product	Spring-summer	Autumn-winter
Processed food	Dairy products	Crescenza cheese	200	200
		Fresh mozzarella	200	200
		Milk	5600	5600
		Parmigiano Reggiano	80	80
		Yogurt	2400	2400
	Oil & fats Frozen desserts Cereals & Bakery	Extra virgin olive oil	860	860
		Ice cream	400	400
		Biscuits / Cookies	480	480
		Bread	2080	2080
		Durum wheat pasta	2600	2600
Fruits & Vegetables	Fruits & Vegetables	Peeled tomatoes	400	400
		Rice	200	200
		Breakfast cereals	360	360
		Seasonal fruits (spring-summer) ¹	6400	0
		Seasonal fruits (autumn-winter) ²	0	6400
		Dried chickpeas	160	0
		Lettuce / Salad greens	400	400
		Potatoes	400	400
		Frozen peas	400	400
		Seasonal vegetables (spring-summer) ³	5760	0
Fish & Seafood	Fish & Seafood	Seasonal vegetables (autumn-winter) ⁴	0	5760
		Fresh anchovies	240	240
		Mackerels	240	240
		Cod	600	240
General food	Meat & meat products	Pork steak	200	200
		Chicken or turkey	400	400
		Eggs	480	480

Notes: ¹ Seasonal fruits (spring-summer) include apples, pears, oranges, mandarins, strawberries, kiwis, and peaches. ² Seasonal fruits (autumn-winter) include apples, pears, oranges, and mandarins. ³ Seasonal vegetables (spring-summer) include eggplants, bell peppers, green beans, cucumbers, carrots, and radishes. ⁴ Seasonal vegetables (autumn-winter) include cauliflower, chicories, artichokes, endive, radicchio, fennel, carrots, and radishes.

Table A.6

Summary statistics of food prices by category and subcategory.

Category	No. of Obs.	Mean	Std. Deviation	Minimum	Maximum	Missing rate
Processed food	30,667	4.222	4.027	0.120	22.900	14.6 %
Dairy products	10,192	5.820	5.830	0.120	22.900	19.6 %
Oils & Fats	4218	6.376	2.222	1.790	12.950	0.1 %
Frozen desserts	1652	3.843	0.776	1.640	5.980	21.8 %
Cocoa, Coffee & Confectionery	2111	5.731	1.021	3.000	9.850	0 %
Cereals & Bakery	12,494	1.986	1.046	0.230	5.700	15.5 %
Fruits & Vegetables	58,645	1.980	0.932	0.270	11.900	66.4 %
Fish & Seafood	5141	6.869	4.148	1.690	22.100	37.2 %
General food	4451	6.845	2.874	0.690	14.200	29.8 %
Meat & Meat Products	3918	7.625	2.074	2.990	14.200	7.2 %
Eggs	533	1.117	0.180	0.690	1.740	74.8 %

Note: Foods were grouped into four major categories and nine subcategories based on international dietary conventions. Specifically, processed food includes dairy products (milk, yogurt, cheese, butter, etc.), oils and fats (olive oil, butter), frozen desserts (gelato), cocoa, coffee & confectionery (roasted coffee), and cereals & bakery (bread, biscuits, pasta, rice, breakfast cereals). Fruits & vegetables include all fresh, frozen, and packaged plant-based foods such as fruits (oranges, apples, pears, peaches, kiwis, strawberries, mandarins, etc.) and vegetables (artichokes, carrots, cauliflowers, cucumbers, chicory, onions, green beans, fennels, lettuces, eggplants, potatoes, peppers, tomatoes, radicchios, zucchinis, and frozen peas). Fish & seafood comprise fresh fish and shellfish (anchovies, mackerels, mussels, clams). General food covers meat & meat products (pork, chicken) and eggs (hen eggs). Frozen vegetables and packaged salads were included under Fruits & Vegetables, and roasted coffee was combined with cocoa-based and confectionery products for consistency with FAO food balance categories.

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