

State Statistics Committee of Ukraine

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**METHODOLOGICAL GUIDELINES ON ORGANIZING STATISTICAL
SURVEILLANCE OVER CHANGE OF PRICES (TARIFFS) ON
CONSUMER COMMODITIES (SERVICES) AND THE CORE
CONSUMER PRICE INDEX CALCULATION**

Kyiv-2007

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Introduction

The methodological guidelines were developed for the purpose of improving organization and enhancing the quality of the statistical surveillance over changes of consumer prices (tariffs) on commodities (services). The methodology of calculation of the consumer prices index is based on general provisions of Convention 160 of the International Labor Organization of 1985 (article 12), "Resolution on Consumer Prices Indices" adopted at the 17th International Labor Statisticians Conference (2003) and the joint document of ILO, IMF, OECD, Eurostat, UN and the World Bank "Guidelines on the Consumer Prices Index. Theory and Practice" (2004).

The methodological guidelines determine the procedure of surveillance over changes of consumer prices (tariffs) on commodities (services) and calculation of the consumer prices index.

The methodological guidelines are intended for use by specialists of state statistics bodies, ministries, other executive bodies, academic organizations, educational facilities, other users of statistical data and will contribute into transparency and better understanding of the methodology of the consumer prices index calculation in the society.

The methodological guidelines were developed by employees of the State Statistics Committee of Ukraine:

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at participation of experts of the Ministry of Economy of Ukraine, the Ministry of Finance of Ukraine, the National Bank of Ukraine, the Institute of Economics and Forecasting of the NAS of Ukraine.

I. General Provisions

The consumer prices index (CPI) characterizes changes in time of the general prices level on commodities and services that the population buys for non-productive consumption. It is the indicator of the change of the cost of the fixed basket of consumer commodities and services in the current period compared with the baseline one.

CPI is the most important indicator characterizing the level of inflation and used for resolution of a number of issues of public policy, analysis and forecasting of price processes in the economy, revision of amounts of monetary incomes of the population, resolution of legal disputes, recalculation of indicators of the national accounts system into fixed prices.

The statistical surveillance over consumer prices and tariff changes is conducted on the sampling basis. Construction of CPI consists of the following main steps:

- forming the consumer basket of representative commodities (services);
- selection of territories;
- selection of baseline enterprises;
- defining the procedure of collecting data about prices and tariffs;
- forming the weights structure;
- calculation of mean prices (tariffs) and individual prices (tariffs) indices on commodities (services);
- calculation of the consumer prices index.

Calculation of CPI is conducted on the basis of data about prices (tariffs) changes obtained by monthly registration of prices (tariffs) in the consumption market and data about the structure of actual consumer monetary spendings of households – the key source of data for forming the weights structure.

II. Glossary of Terms

When defining CPI, the following terms are used.

Baseline weights structure period – the period of time to which the calculated weights structure is related.

Baseline index period is the period of time for which the index value is considered to be 1.0 or 100%.

Baseline enterprise – trade, services enterprises, markets where registration of prices (tariffs) on consumer commodities (services) is held.

Weights structure (weight coefficients) is the share of consumer spendings on buying representative commodities (services), which is defined on the basis of actual consumer monetary spendings of households.

Deflation – withdrawal from the rotation of the excessive monetary mass issued in the period of inflation, which is accompanied by general reduction of prices on commodities and services.

Weighing is a method of index calculations for receiving aggregated indicators by individual items, each of them attributed with a set value, or weight, in their total aggregate.

Selection – group or part of units of the aggregate surveyed that was selected considering that it will be representative for this whole aggregate.

Type of commodity, its properties – complete, detailed description of commodities (services) selected for surveillance.

Group of commodities (services) – aggregate of representative commodities (services) united based on consumer destination and origin.

Group index – index for a group of commodities (services) that is the weighted average indicator for individual indices of representative commodities (services).

Household – aggregate of persons living together in the same housing premises or its part, provide themselves with everything they need for living, run common house, fully or partly unite and spend money. A household may consist of one person.

Economic district – group of regions suggested by the Council for Productive Forces Studies within the framework of the program "Ukraine 2010".

Price index – relative indicator expressed in coefficients or percents characterizing prices change in time (index of dynamics) or in space (territorial index).

Long-term price index – the price index of representative commodities (services) of the current or previous period compared with the baseline one.

Short-term price index - the price index of representative commodities (services) of the reporting period compared with the previous one.

Individual index – index obtained on the basis of mean prices on the representative commodity (service) in the reporting month and the previous one.

Inflation – devaluation of money and non-cash funds accompanied by growth of prices on commodities and services.

Classification of types of economic activity (CTEA) – a constituent of the system of national classifiers developed on the base of the international statistical classification of types of activity of the European Union and intended for systematization and grouping of economic data. For development of the system of classifications of the European Union, the structure and description of the International Standard Industrial Classification of Economic Activities ISIC was used as the basis (Rev.3.1 - 1989, UN).

Classification of individual consumption based on purposes (KCPI) – functional classification being a part of the National Accounts System of 1993 and reflecting grouping of households' spendings on commodities and services.

Urban settlements – the cities of Kyiv, Simferopol, Sevastopol, oblast centers, rayon centers and other cities.

Comparative price (tariff) – price (tariff) on a commodity (service) having concrete consumer properties registered in the reporting month and the previous one at the same baseline enterprise.

Current (reporting) price – price at a set period of time at a baseline enterprise at the moment of its registration.

Regions – Autonomous Republic Crimea, 24 oblasts, cities of Kyiv and Sevastopol.

Prices registration – method of collecting data on prices (tariffs) on commodities (services) included into the consumption basket at a sample aggregate of baseline enterprises by way of visiting these enterprises.

Market price – price formed under the impact of the demand and supply for a commodity at competitive market conditions.

Consumer monetary spendings of households – monetary spendings of households for purchase of food, alcoholic and tobacco products, commodities and services (clothes and footwear, payment of the housing fee, water-, gas-, electric power-supply fee and fee for supply of other types of fuel; furniture, household consumption articles, household equipment and commodities for everyday maintenance of housing; costs of healthcare, transport, communication, leisure and culture, education, etc.).

Consumer basket of representative commodities (services) (basket) – the uniform for all regions of the country representatively formed list of commodities and services most frequently consumed by the population.

Consumer price (tariff) – actual price (tariff) on a commodity (service) realized in free sale at baseline enterprises in view of the VAT, excise duty and other indirect taxes.

Consumer commodities (services) – commodities (services) used by the population for individual or family consumption.

Seasonality – concept that characterizes a change of phenomena in dynamics during a year, which are repeated and may be caused by various

reasons, including changes of seasons, natural phenomena, as well as customs, traditions, holidays, etc.

Mean price (tariff) of a representative commodity (service) – average level of the price calculated on the base of registered prices (tariffs) on concrete commodities (services) at baseline enterprises.

Mean price for a region – weighted average price calculated on the base of mean on a representative commodity (service) registered in urban settlements.

Representative commodities (services) – aggregate of the types of commodities (services) homogeneous by their consumer properties and intension and having identical prices change trends.

Price – monetary reflection of the cost of commodities (services) per their quantitative unit.

III. Principles of Forming the Consumer Basket of Representative Commodities (Services)

The consumer basket of representative commodities (services) on the basis of which surveillance over prices (tariffs) changes are conducted and CPI is calculated is uniform for all regions of the country. The basket is defined in a centralized way by the SSC of Ukraine in view of suggestions of territorial state statistics bodies, coordinated with interested economic institutions, trade unions, research facilities, remains unchanged during a set period of time and is the starting point for selection of concrete commodities and services for prices registration in regions.

The basket includes commodities and services of mass consumer demand, regardless of whether prices (tariffs) on them are regulated (set), whether they have a free (market) nature, as well as separate commodities and services related to non-primary needs (passenger cars, golden jewelry, delicacy products, etc.). Inclusion of representative commodities (services) into the basket is conducted on the basis of data about consumers monetary spendings of all (urban and rural) households.

Commodities (services) bought for the purpose of accumulation (antiquity articles, works of art, antique jewelry, etc.), investments (purchase of housing, land plots and other tangible and intangible assets), saving, payment of direct taxes, fees into the Pension Fund, life-insurance, fines are not consumer commodities (services) and are not included into the consumer basket.

The basis of the consumer basket construction is represented by the following main principles:

- the necessity of actual reflection of the structure of consumers monetary spendings of households;
- the possibility of optimum organization of the prices registration process.

According to the first principle, commodities and services that are undesirable from the social point of view but make up substantial cost items for households (for example, tobacco, alcohol) are included into the set. At the same time, some services (for example, renting housing, tutors' services), the prices on which it is very difficult to define clearly, in particular, because of low transparency in the proper sectors, are not included into the basket, as they do not meet the second principle of the basket's construction.

A criterion for inclusion into the basket of new commodities is their share in total consumer spendings of households – no less the 0.1% for food and 0.2% for non-food products.

The basket is usually reviewed once in five years taking into account changes in the consumption market of regions and in the structure of consumer monetary spendings of households.

The consumer basket of representative commodities (services) for calculation of CPI is attached in *Annex 1*.

Selection of commodities (services) for registration of prices (tariffs) is carried out stage-by-stage using the method of targeted selection.

First, the list of representative commodities (services) and the general description of their consumer qualities are defined at the central level. This description does not contain any detailed qualities of commodities (services), which is conditioned by the following reasons:

- the detailed description may be not typical in different baseline enterprises and regions;
- dynamics of the consumption market – under the impact of a number of factors (fashion trends, consumption culture, scientific and technical progress, etc.) qualities of concrete commodities and services might substantially change.

Then specialists of territorial state statistics bodies in every urban settlement where surveillance over consumer prices (tariffs) changes is conducted independently select concrete commodities (services) taking into account specific features of the consumption market status in the region. The following selection criteria are thus used:

- considerable demand among the population for these commodities (services);
- their regular availability at the baseline enterprise during a set period of time.

In the event of systematic absence in the consumption market of an urban settlement of specific representative commodities (services), surveillance over these items is not conducted.

IV. Principles of Selecting Territories

Surveillance over prices (tariffs) changes is conducted in urban settlements of all regions of the country. Selection of urban settlements, in which surveillance over consumer prices (tariffs) changes on commodities (services) is conducted, is carried out at the central level and is representative for calculation of CPI for each of the 27 regions of the country.

Information about prices (tariffs) is collected in oblast centers, the cities of Kyiv, Simferopol, Sevastopol and cities and rayon centers selected on the basis of the procedure of stratified multi-stage selection with the elements of the probability method proportional to the size. This method envisages selection of units from the general aggregate by attributing every unit with probability of inclusion into the sample proportional to a certain auxiliary variable, namely the number of population.

The selection process consists of the following stages.

At the first stage, city settlements are distributed into strata depending on the average annual number of available urban population of each of the regions.

- 1 stratum – the number of population more than 100000 persons;
- 2 stratum – 50000 -100000 persons;
- 3 stratum – 25000 -50000 persons;
- 4 stratum – up to 25000 persons.

At the second stage, calculations of the share of population and number of prices registrations are conducted for every stratum of every region in the total number of population and registrations all over the country, as well as the share of population and registrations by each stratum within the region for the purpose of comparing data for every region on the whole and the economic district with data for the entire country. Accordance of these correlations is a criterion for selection of urban settlements for surveillance over consumer prices (tariffs) changes.

At the third stage, selection of urban settlements from every stratum is carried out. Every stratum is a diminished total aggregate, in which selection is carried out separately.

Surveillance over consumer prices (tariffs) changes includes all the urban settlements from the first and second strata that are self-representative.

From the third and fourth strata, one urban settlement is selected from each, which meet the following requirements:

- the greatest number of population and prices registrations;
- representative consumption models for each of the regions;
- sufficient saturation of the consumption market with commodities (services) for realization of registration for the maximum number of representative commodities (services) from the consumer basket;
- even geographical coverage of regions with prices registration.

The list of urban settlements in which surveillance over consumer prices changes is conducted is attached in Annex 2.

V. Principles of Selecting Baseline Enterprises

Surveillance over changes of prices (tariffs) on commodities (services) is carried out based on the sample range of baseline enterprises.

Baseline enterprises are selected by specialists of local state statistics bodies. The structure of selected baseline enterprises is annually reviewed.

For selection of baseline enterprises, data of trade and services statistics on distribution of volumes of retail commodity turnover and services realized by forms of ownership and surveys of households' living conditions related to monetary spendings on purchase of commodities at the place of purchase are used.

When forming the aggregate of baseline enterprises, it is necessary to be guided by the following:

- surveillance over prices (tariffs) changes is conducted at retail trade, restaurant and services enterprises of all forms of ownership (state, private, communal), as well as at food, clothing and mixed markets;
- large, medium and small trade and services enterprises are selected in every urban settlement, located both in the central part of the urban settlement and those distanced from the center, i.e. those with different trade (servicing) conditions.

The selected aggregate of baseline enterprises must meet the following requirements:

- regular selling of commodities and realization of services selected for surveillance;
- branded stores, salon shops are included into surveillance provided they sell commodities that with their consumer properties and the prices level are intended for mass consumption;
- trade enterprises commodities in which commodities are realized the prices level of which significantly exceeds the average level of prices on such commodities are not included.

For example, it is not necessary to register prices in stores (boutiques) that sell exclusive models of clothes or ultra-fashionable shoes of prestigious foreign firms, because, apart from the high prices, the commodities are usually supplied into these shops in small quantities with continuous updating of the assortment, which considerably complicates the process of surveillance over price changes.

- trade enterprises in which insignificant amounts of commodities are realized that appear on sale irregularly (stock stores) or such that specialize in selling used commodities (second hand) are not included into the surveillance.

In departments stores, supermarkets, hypermarkets, specialized shops located in different parts of the city that are included into a uniform sale network registration of prices is conducted for the most complete list of commodities. Thus, the number of prices registered for every representative commodity in the

shops of this network selected for surveillance must representatively reflect the volume of commodities realized in all shops of this network located in the urban settlement.

For the purpose of facilitating subsequent identification of trade services enterprises, specialists of territorial state statistics bodies draft the list of baseline enterprises and include into it their full names, addresses and telephones.

Before selecting a concrete enterprise, it is necessary to visit it and to compare the assortment offered with the one needed for registration of prices. The assortment offered must include the greatest possible part of the consumer basket. For registration of prices of the non-covered part of the basket, it is necessary to look for other enterprise.

If an enterprise selected for surveillance closes down or loses a significant part of its market, the recorder must pick up another one, in which the range of commodities, level of prices, conditions of realization of commodities (services) are similar to the one that closes down.

VI. Procedure of Collecting Data on Prices (Tariffs)

Collection of information on consumer prices (tariffs) is conducted monthly by specialists of territorial state statistics bodies by visiting baseline enterprises and registering prices (tariffs) on commodities (services) included into the consumer basket.

The actual price of a concrete commodity (services) that is realized in the consumption market taking into account taxes that the population pays (VAT, excise duty and other indirect taxes) is subject to registration.

Registration of prices (tariffs) is conducted monthly:

- in regional centers, the cities of Kyiv, Simferopol, Sevastopol – from the 1st till the 25th day of the month;
- in rayon centers and other cities – from the 1st till the 20th day of the month.

For separate commodities, the list of which is attached in *Annex 3*, registration of prices is conducted during the whole month. The list includes commodities with a significant part of spendings on their acquisition in the total consumer spendings of households and prices on which are subject to substantial fluctuations during a month.

On every representative commodity in the oblast center, the cities of Kyiv, Simferopol and Sevastopol, not less than 9-10 prices are registered, in rayon centers and other cities – not less than 5-6 prices, for services – 7-8 and 4-5 prices respectively. An exception is separate types of services (electric power, gas, communication services, railway intercity transport) for which uniform tariffs apply controlled (set) by the proper executive bodies.

Registration of prices of the same concrete commodity (service) in the reporting month at the same baseline enterprise is conducted on the same days of the month as in the previous month. The variation can make no more than 1-2 days. Registration of prices on fresh produces in the market (for example, vegetables, fruit, milk and dairy products, fish, etc.) is conducted in the part of the day when the greatest number of purchases is made.

The survey includes only new commodities of both domestic and foreign production, except for "elite" commodities, such as jewelry with diamonds, expensive brands of imported cars, furniture, alcohol, etc..

Seasonal discounts, promotion actions, sales of commodities have become a characteristic feature of the commodity market.

Seasonal discounts, sale prices are taken into account if:

- they are a permanent and wide-spread feature of the consumption market;
- the commodity proposed for sale is the same as in the previous month, not damaged, the shelf life of which has not expired;
- the weight (packing) remains unchanged;
- all consumers without exception enjoy the discounts.

Reduction of prices is not taken into account if:

- the commodities are damaged or their shelf life has expired;
- the discounts are offered to regular clients or are exceptional;
- only separate categories of consumers enjoy the discounts (students, pensioners);
- the commodity offered as a bonus in the case of buying a certain product (promotion offers);
- discounts depend on the amount of commodities offered (two units for the price of one).

It is not allowed to register all prices on a representative commodity (service) only at one baseline enterprise, as well as calculation of price indices on the basis of one registered price, as these data do not reflect the actual consumption market status of the urban settlement (except for the commodities (services), prices (tariffs) on which are controlled (set) by the government or local executive bodies or local self-government bodies).

It is not allowed to carry out calculations of mean prices and individual price indices on the basis of registered prices on commodities that produced by only one producer, as in this case a change of the price policy of one producer is extrapolated to the whole consumption market of the region, which does not reflect the actual situation, since the population buys very different products.

For example: dairy products only of "Galakton" company, sunflower oil – by "Chumak", beer by "Sarmat", etc..

Prices on commodities (services) are registered evenly during the period of registration. This refers to all commodities and services, and especially – food products. At the same time, the prices that are regulated with decisions or orders of the respective executive bodies or local self-government bodies (tariffs on communication services, housing and communal services, etc.) are registered once during the registration period taking into account the date of their enactment.

For every representative commodity (service), a separate "Form for registration of prices on consumer commodities and services" (*Annex 4*) is filled in, in which prices (tariffs) and a detailed description of the selected concrete commodities (services) are indicated. The commodity description is important, as it provides the recorder with information for which commodity it is necessary to register prices. If it is not detailed enough, there is the probability of registering prices on commodities of differing quality. The description contains the full name of the commodity, country and producing enterprise, brand, sort, type, size of the container, etc.

The form consists of two sections: section A (trade, service enterprises (facilities) of all forms of ownership) and section B (markets). Prices on food and non-food products realized at organized markets by legal entities are included into section A, by individuals – into section B. Prices (tariffs) on services are only included in section A.

In the address part of the registration form, the name and code of the representative commodity (service) and the unit are specified.

In column 2 – the name and address of a trade, service enterprise, a market;
in columns 3, 8 – the dates of registration of prices;
in columns 4, 9 – the description of the commodity (service);
in columns 5, 10 – the packing volume (weight);
in columns 6, 11 – the price per pack.

The registered price is recalculated in units (kilogram, liter, etc.) and included into columns 7 and 12. The recalculations are conducted only for those commodities that are sold in jars, bottles, packs, etc. At the same time, it is necessary to compare prices on commodities in the same containers and packs of an identical weight, as the recalculations may result in distortion of the individual index (commodities in bigger containers become relatively cheaper than those in smaller ones). For realization of registration in the reporting month, in columns 2-7 data from columns of 2, 8-12 of the previous month are indicated.

One of the main preconditions of obtaining maximally precise and reliable data used for the calculation of the consumer prices index is observance of comparability of prices in the reporting and previous periods, i.e. the identical number of registrations for every commodity (service) during the two periods.

For example, if for the representative commodity 6 prices were registered in the previous month, while in current one – 5 prices, and calculation of mean prices and individual prices indices is made on the basis of all registrations in every month, it is

possible that a change of mean prices will be recorded, while all the prices remained unchanged, only one of concrete types of this commodity (for which the price was registered in the previous month) disappeared from sale.

To provide for comparability of price data and its continuity, methods of replacement of representative commodities (services) are used.

VII. Key Methods of Substituting Representative Commodities (Services) Applied at Prices Registration

In the course of time, separate commodities disappear, others undergo significant changes or are replaced by competitive products and are almost no longer realized. In these cases, their replacement with other ones is carried out. Replacement of commodities is also conducted for the purpose of providing for representative calculation of CPI, as long-term surveillance over prices on the same concrete types of commodities (services) may result in that the consumer basket will not meet the modern model of households' consumption.

The following situations are possible in the consumption market:

- a commodity (service) is temporally absent;
- a commodity (service) has disappeared for ever;
- a commodity (service) is present in the market, but volumes of its realization gradually reduce.

A commodity may be temporally absent from sale because of a temporary termination of its productions, interruptions in supply of raw materials, absence of demand on the products, difficulties with transportation, exhaustion of the stock in trade, etc. In the case of absence during the reporting month of the selected type of a commodity (services) at the baseline enterprise (at availability of information about that realization will be renewed in the future), calculation price defined based on one of the following methods is used:

- the price of the previous month is automatically carried on to the reporting month (provided a stable price situation);
- with application of the price index on a similar commodity (service).

Examples.

A recorder must register in the reporting month price per kilogram of wheat flour of the highest sort produced by "KyivMlyn" (the price of the previous month made up 2.40 UAH), however, this commodity is temporally absent from sale. A trade worker informs the recorder that because of difficulties with supplies, this flour will appear on sale later. Besides, he knows that no change in price on this commodity is planned. In this case, the price for the previous month (2.40 UAH) is automatically carried on the reporting month.

In the previous month, the price on mineral water "Truskavetska" was registered (packing 1.5 l, price 1.70 UAH), in the current month this water is absent from sale. But in the previous and in the reporting months the mineral water "Luganska" is on sale in the similar packing at the price of 1.90 UAH and 2.00 UAH

respectively. The price index on water "Lugansks" is 105.3% ($2.00/1.90 \times 100\%$). The calculation price on water "Truskavetska" will be 1.79 UAH in the reporting month ($1.70 \times 105.3/100$).

Thus, when defining the calculation price, prices on commodities involved into promotion actions are not used.

The calculation price is used for maximum two months, later, if the commodity is still absent, its replacement is carried out.

Such approach is not applied to seasonal commodities. The procedure of calculation of price indices on seasonal products is explained in Section VIII.

In the event a commodity disappears from sale forever or undergoes significant transformation, its replacement is carried out applying one of the following methods.

The method of direct replacement is used in the case of availability in the assortment of commodities offered by the baseline enterprise of a commodity with similar properties and consumer descriptions. Thus, replacement of the commodity is conducted by including into the form a detailed description of the "new" commodity and its price. When applying this method, the price of the "new" commodity is directly compared with the price of the "old" commodity and takes part in calculation of the index for the reporting month.

For example, caramel "Malibu Strawberry" produced by Roshen company at the baseline enterprise is temporally absent (the price in the previous month made up 12.00 UAH per kg). Instead, caramel "Malibu Apricot" produced by the same enterprise is on sale at the price of 12.10 UAH. Since these two commodities are practically identical, their prices are compared directly and the index for the reporting month is 100.8% ($12.10/12.00 \text{ UAH} \times 100$).

For using the chain method, it is necessary to find a new commodity that does not have drastic differences from the old one and obtain the price on it for the previous month. This method is based on the assumption that, as the both commodities are for sale simultaneously, the difference in price between them proves a difference in quality. I.e., the commodity the price of which must be registered disappeared and does not have a direct substitute, but there is a commodity close enough to the old one, the price on which is known for the previous month. Thus, the "old" commodity is replaced with the "new" one.

For example, the microwave "LG MS 2345", volume 20 l, with the main basic functions and mechanical handling (price 430 UAH) is no longer produced, but the microwave "LG MS 2352" with the same functions and touch-activated handling is available on sale at the price of 520 UAH. Proceeding from this information, it is possible to consider that the both microwaves do not drastically differ from each other. The price of the new stove in the previous month, based on information by the salesman, made up 515 UAH. The "old" commodity is withdrawn from the form, the price of the "new" one in the previous and reporting months is indicated, which makes it possible to

calculate the price index in the reporting month, which is 101.0%, (520/515 UAH x 100%).

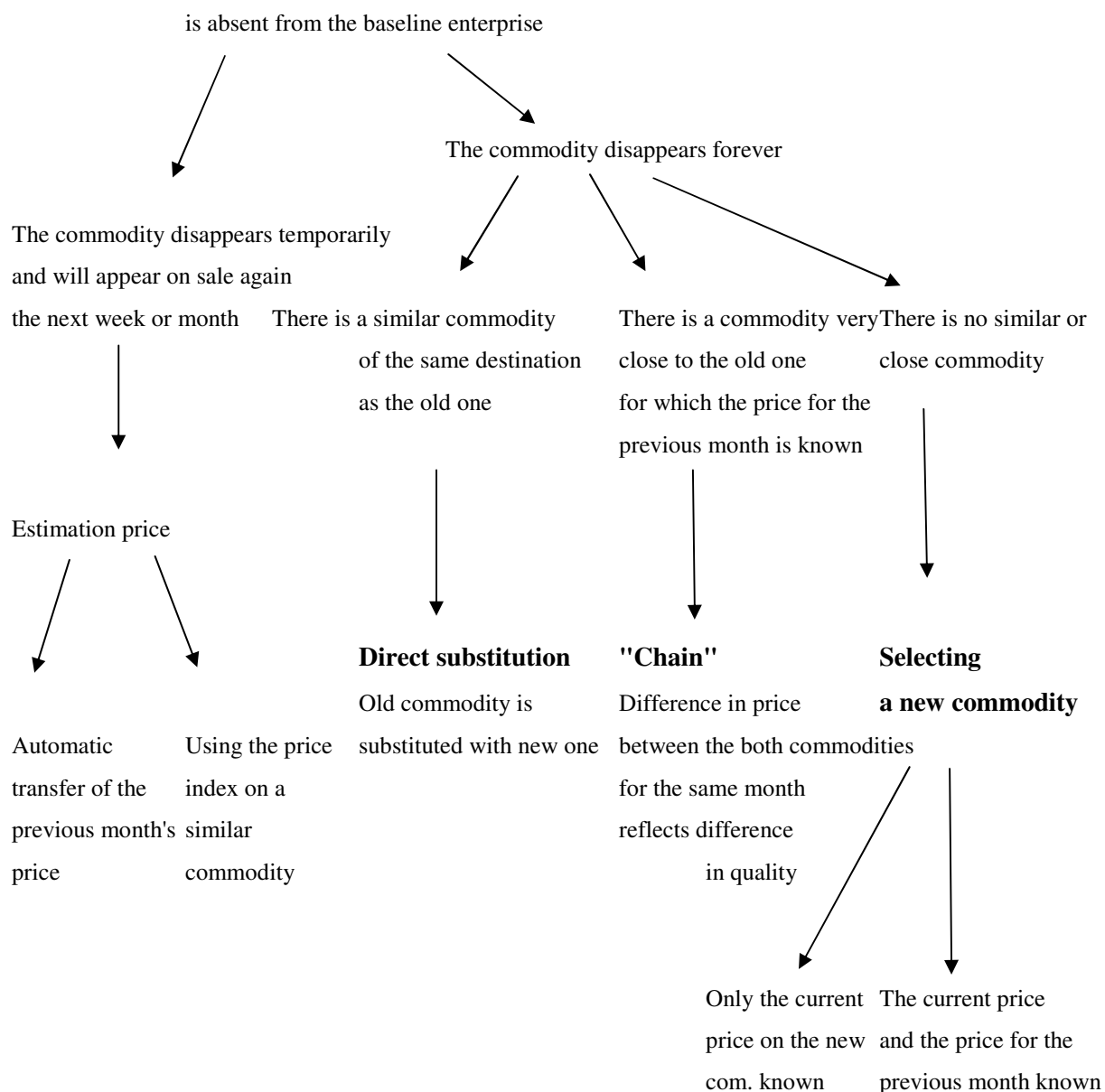
The choice of a new commodity is carried out in the case when there is neither a direct substitute, nor a commodity close enough to the "old" one. In this case, the "old" commodity is withdrawn from the survey, thus, for the purpose of providing for an equivalent number of prices, another, updated commodity is selected. In the case the price on the "new" commodity is known only for the reporting month, it is included into the form for the reporting month as baseline and is used for calculation of the index in the next month. If both the reporting and the previous price of the "new" commodity are known (the price for the previous month can be obtained from the manager of the point-of-sale), the "new" commodity takes part in calculation of the prices index in the reporting month.

For example, the microwave "LG MS 2345", volume 20 l with main basic functions and mechanical handling (price 430 UAH) is no longer produced. The microwave "Samsung MW 87 WR ", volume 23 l with additional functions and dialog handling in on sale at the price of 750 UAH. Considering that between these microwaves there is a significant difference in quality and these commodities belong to different price segments, they cannot be compared. In this case, the "new" commodity is included into the form, and the "old" commodity is withdrawn. If the price for the previous month is not known, the price of the new commodity is included as baseline and will be used for calculation of the price index in the next month. In the case there is an opportunity to define the price of the microwave "Samsung MW 87 WR" for the previous month, this commodity is included into calculations of the mean price in the reporting month.

A commodity may be available in the consumption market, however, volumes of its realization gradually go down because of appearance of new competitive commodities. The price dynamics for the out-of-date commodity because of the reduced demand may substantially differ from the actual dynamics of prices on similar commodities. For example, mobile phones, TV sets, music centers, modern types of clothes and shoes belong to such commodities. Replacement of the commodity is conducted in such case. The replacement commodity is selected from among commodities with similar consumer qualities, thus, the main replacement criterion is volumes of sales of the "new" commodity. For the purpose of providing for a correct replacement, parallel registration of prices on "old" and "new" commodities is conducted during two or three months, and in this period in indices calculations prices on the "old" commodity are included. The final replacement of the commodity is carried out provided there is stably growing demand on the part of the population and permanent availability of the "new" commodity in the consumption market.

Commodities substitution chart

Commodity selected for surveillance



VIII. Calculation of Price Indices on Seasonal Products

In composition of the consumer basket of representative commodities (services) there are seasonal commodities, prices on which undergo regular seasonal fluctuations. In some cases they are conditioned by natural factors related to the supply (this is true for fresh fruit, vegetables, potato, live fish, etc.), in others – by climate conditions related to the demand (for example, clothes, shoes, sports products, fuel, refreshments, ice-cream, etc.).

The regular character of seasonal fluctuations does not mean that dynamics of realization volumes and prices on a certain seasonal commodity in the current year coincide with those in the previous year. This is related, in particular, with different weather conditions and crop yield, progress in production technology.

Seasonal are those commodities (services) that a) are absent from the market during certain periods of the year or b) are available during the entire year but are characterized by regular price fluctuations that coincide with certain seasons or times of the year and seasons. Commodities that can be attributed to the first category are referred to as the most characteristic seasonal commodities, to the second one – less characteristic ones.

Separate food products, among them fruit and vegetable products and early potato, belong to the most characteristic seasonal commodities.

Clothes and shoes belong to the less characteristic ones. Price changes on clothes and shoes are characterized by seasonal fluctuations, however, in contrast to fruit and vegetable products and early potato, they do not have a substantial impact on the CPI rate, as commodities of the summer and winter assortments are available on sale throughout the year. At the same time, the seasonal nature of demand on goods of the groups mentioned conditions realization of sales, seasonal discounts, etc., which are taken into account during registration of prices when they are massive, unlimited in quantity, are provided for all categories of population without exception and are not related to changes in quality of the commodities.

At calculations of price indices on fruit and vegetable products and potato, the following methods are used:

- method of average seasonal prices;
- method of replacement of commodities;
- method of weighted average prices.

The method of average seasonal prices envisages calculation of price indices by comparison of prices registered at the beginning of the season of the current year with average geometrical prices of the season in the previous year.

For example, calculation of the price index on strawberry in May of the current year is conducted by dividing prices of May of the current year by the average seasonal price for May-July of the previous year.

The average seasonal price on strawberry in the previous year is calculated in the following way: $\sqrt[3]{17,70 \cdot 7,38 \cdot 6,15} = 9.30$ UAH. The estimation price is used as the baseline one in April of the current year for calculation of the price index for May of the current year.

A tentative example of calculation of price indices on strawberry is offered below.

	Previous year	Current year	
	price, UAH	price, UAH	Price index to the previous month, %
April	0	9.30	x
May	17.70	19.00	204.3
June	7.38	8.20	43.2

July	6.15	7.50	91.5
------	------	------	------

As can be seen from the table, the price index in May will make up 204.3% ($19.00:9.30 \times 100$), in June – 43.2% ($8.20:19.00 \times 100$), in July – 91.5% ($7.50:8.20 \times 100$).

Upon termination of the realization season, the average seasonal price is not used in calculations of the individual index until the beginning of the new season, i.e. for the item "berries" the price and the individual index will be "0".

The same approach is used at calculations of price indices on drupaceous fruit, watermelons and melons, marrows, egg-plants, pumpkins, pepper, cucumbers, tomatoes.

The method of commodities replacement is used if there is no information about distributing of sales volumes of late and early sort products. Replacement of fruit products of late and early sorts is conducted by double registration, which makes it possible to conduct calculations of indices in the reporting month on the basis of prices of products of late sorts and to create the base for calculation of indices in the next month on the basis of prices of early sorts products. This method is used when calculating price indices on apples and grapes, as there is a substantial difference in prices and quality between late and early sorts of apples and grapes.

For example, the price index on apples in July is calculated on the basis of prices on apples of late sorts (harvest of the previous year). At the same time, for the purpose of creating the base for calculation of the index for August, registration of prices on apples of early sorts that start appearing in the consumption market is conducted. Thus, the index for August is calculated on the basis of prices on apples of early sorts.

The method of weighted average prices is based on calculation of prices taking into account the share of realization volumes of early and late vegetables (harvest of the previous year).

Some types of products (potato, cabbage, carrot, beet) during several months are available on the sale in the two varieties: early and late (harvest of the previous year) ones. During these months, prices on the first ones are three or four times higher than prices of the second ones, and in a few months early sorts are gradually substituted with late ones.

For defining the mean price on, *for example*, potato at the period of transition from realization of late potato to sale of early one, registration of prices is conducted separately: for early potato and late potato, thus – on early potato starting from the moment of its appearance on sale. However, information on prices on early potato is included into calculations of the consumer prices index only starting from the moment when realization of this commodity becomes widespread (in the majority of regions – in June).

For calculations of the weighted average price of potato, the gradually growing part of early potato in the general volume of realization of this commodity and, thus, declining of the part of late potato are taken into account. It is carried out through the number of the proper price registrations.

Calculation of price indices on potato in the majority of regions is carried out using in May prices on late potato, in June, July – on late and early potato, in August – on early one. The mean price in June is calculated on the basis of registered prices on late and early potato taking into account information about the volumes of sales of these types of products at city markets within the region (based on trade statistics data). Taking into account climate conditions, in separate regions prices on early potato can be used for calculation of the mean price already in May in view of the proper realization volumes of early and late potato.

A tentative example of calculation of the mean price and price indices on potato is offered below.

	Early		Late		Mean price, UAH	Price index To the previous month, %
	price, UAH	share, %	price, UAH	share, %		
May	0	0	1.06	100	1.06	x
June	2.03	36	1.07	64	1.41	133.0
July	1.45	80	1.10	20	1.38	97.9
August	1.14	100	0	0	1.14	82.6

The mean price in June is calculated as follows: $(2.03 \times 0.36) + (1.07 \times 0.64) = 1.41$ UAH. In the same way, the mean price in July is calculated; in May and August, mean prices are 1.06 UAH and 1.14 UAH respectively, as in the consumption market in May there is mostly late potato, while in August – only early one.

How can be seen in the table, the price index in June will be 133.0% $(1.41:1.06 \times 100)$, July – 97.9% $(1.38:1.41 \times 100)$, August – 82.6% $(1.14:1.38 \times 100)$.

This method makes it possible to link prices on early potato with prices on late potato. A substantiated replacement of the price of the baseline period and correct definition of the part of early and late potato in the total volume of realization of this commodity at calculations of weighted average prices guarantees continuous calculations of the price indices chain and allow avoiding distortion of the index as a result of improper replacement of the price of late potato.

The same approach is used for calculations of price indices on cabbage, carrot, beet.

IX. Specific Features of Surveying Prices on Separate Types of Commodities and Services

Registration of prices on separate types of non-food products, in particular clothes and shoes, in the conditions of frequent changes of the assortment and permanent fashion development, has its specific features. Thus, it is sometimes difficult to find a commodity with the same characteristics as in the previous month. Consequently, the recorder must carry out replacement of the commodity. Thus, it is necessary to stick with the following rules:

- To exactly to adhere to the commodities description included into the rationale for the consumer basket.

For example, if in the previous month for the item "female overcoat, semi-overcoat" prices were registered on overcoats made of wool, in the current month it is necessary to survey prices on woolen overcoats, not those from synthetic materials.

- To select "standard" or "classic" products, which are less impacted by fashion than those that remain "fashionable" for a set period of time.
- Morally outdated models that are no longer in demand, and thus cannot characterize the dynamics of price changes must be substituted with more up-to-date ones.
- To compare mixed fabrics only with similar ones, i.e. to adhere to the same composition; proportion (percentage) of each of component materials may fluctuate no more than for ± 10 p.p.

For example, to compare a skirt made of wool / polyester with a skirt of wool / polyester, not with a skirt of cotton / polyester; pullover 50% of wool / 50% of polyester – with a pullover 60% of wool / 40% of polyester, not with a pullover 30% of wool / 70% of polyester.

- It is possible to cross-compare such synthetic materials as acryl, polyacryl, polyamide, polyester.

The separate types of furniture and household equipment are also subject to frequent changes in the assortment. The quality factor plays a great role for commodities of this type, that is why it is necessary to as precisely as possible estimate the quality of the commodity to compare it with others if necessary. In this connection, descriptions of commodities prices of which are registered must be more detailed. Apart from the standard description, it is necessary to be attentive to such aspects: material (type of timber) and quality of final processing. In these cases, it is necessary to consult with the salesperson and register detailed characteristics.

Examples.

Sofa, produced in Ukraine, LTD "Proun", model "Viktoria", size 220x80x70, hideaway, chipboard frame, spring mattress, upholstery material – polyester velour, soft elbow-rests, seat surface with artificial soft "hills".

Tile ceramic, walling, glazed, produced in Ukraine, Kharkiv, model "Agate", size 25x25.

For surveillance over prices on household appliances commodities and TV / radio commodities represented in the consumption market by a varied, frequently updated assortment of products with substantial divergence in quality characteristics and consumer properties, as well as a great differentiation of prices, the maximally possible number of different models are included.

Thus, when selecting concrete commodities for surveillance, as well as tracking change of assortment, apart from questioning salespeople, publicity products that contains descriptions of concrete models, catalogues, price-lists, etc. are studied.

The market of mobile phones is the most dynamic one.

For the item "Mobile phones", the price on separate models and brands of mobile phones of the medium price class in the complete set (handset, battery and other accessories included into the set) produced by the firms that are most widespread in the consumption market (Sony Ericsson, Motorola, Nokia, Samsung, Siemens) is registered.

The price of a mobile phone is registered without the tariff plan coverage – connection to the mobile communication network.

For surveillance, models and brands of mobile phones are selected the prices level on which is within the midrange (without a camera).

In connection with that during a year considerable updating of the assortment takes place, it is recommended to start the surveillance over prices on new models of phones from the moment of their appearance in the market, but into calculation of the index, it is necessary to include prices on these models after 2-3 months of surveillance, when after disappearance of the novelty factor the dynamics of their prices has a stable nature. Prices on these models are used for calculation of the index until the moment when, as a result of moral outdated, the volume of their sales starts decreasing and prices start reducing substantially.

Partial rotation (inclusion into the calculation of the mean price on 1-2 new models with simultaneous withdrawal of the same number of out-of-date models) is carried out 2-3 times a year.

A similar method is used for registration of prices on computer hardware.

Surveillance over prices (tariffs) on housing and communal services has its specifics. Currently, it is popular to differentiate the apartment rent or house maintenance fee depending on living conditions (on the year of construction, the floor, presence of elevators, etc.). In the case when data about correlation of housing of different types are absent, calculation of the mean price is carried out based on the formula of the unweighted geometrical average. I.e., in those settlements where differentiated payment applies, the mean price of 1 sq.m. of dwelling space is calculated by collecting all operating tariffs and extraction of the root of the degree equal to the number of registered tariffs.

At the same time, authorities in a number of regions implement differentiated tariffs on central heating, hot and cold water-supply in the heating and non-heating seasons. In this connection, the fee for these types of services

substantially fluctuates during a year. These changes must be necessarily taken into account at calculation of individual indices.

For example, the tariff for heating of 1 sq.m. of housing in the heating season (October-March) is 0.80 UAH; in other months – 0.40 UAH. Thus, the individual price index in April is 50% ($0.40:0.80 \times 100$), and in October - 200% ($0.80:0.40 \times 100$).

Prices (tariffs) on some types of services, for example, a tourist trip abroad, are set in foreign currency (euro, USD). Registration of prices on such services is defined by conversion of their price from the currency indicator into UAH based on the exchange rate set by the National Bank of Ukraine calculated as an average for the registration period.

Prices (tariffs) on separate commodities (services), in particular, those, that are controlled (set) by executive bodies or local self-government bodies, can be enacted not from the first day of the reporting month. Such commodities (services) include, for example, separate sorts of bread, tariffs on transportation by railway, communication, etc. In that case, the mean price for the reporting month is calculated based on the formula of the weighted arithmetic average.

For example, prices on bread "Ukrainsky" rose in June, 11 (from 1.60 UAH to 1.80 UAH per kg). The mean price for June makes up 1.73 UAH ($1.60 \times 10 + 1.80 \times 20$) /30).

X. Forming the Weights Structure

For forming of the weights structure (weight coefficients), data obtained as a result of households' living standards survey (HLSS) are the foundation of the data base.

Weight coefficients reflect the relative significance of commodities (services) measured with their part in households' consumption and represent the degree of the price (tariff) change's impact for every commodity (services) on the size of the total CPI. With the help of weight coefficients, aggregation of indices from the lowest level to the highest one is carried out.

Revision of the weights structure is carried out annually. Review procedures and transition to new weight coefficients meet international standards, which makes it possible to calculate CPI for different periods using different baseline years.

For definition of the weights structure, consumer monetary spendings of all (urban and rural) households are applied.

The main principle of forming the weights structure for calculation of CPI is the maximum coverage of data on consumer monetary spendings of households.

Weight coefficients are calculated as a part of consumers monetary spendings on every commodity (service) in the total consumer monetary spendings of households per year, and every commodity (service) has its percentage in calculation of CPI, which is defined with the precision of 0.00001.

For calculation of consumer prices indices by regions, weight coefficients calculated at the level of 8 economic districts are used. Weight coefficients for each of the economic districts are calculated on the base of data on consumer monetary spendings of all households in view of HLSS results. Methodological principles of forming the system of weight coefficients are uniform for all economic districts.

Weight coefficients by economic districts are used for calculation of CPI by every region that is included into the respective economic district. The city of Kyiv because of its special status and a different consumption model is surveyed as a separate district, thus the Central district is divided into two: Kyiv and Kyivska and Cherkaska Oblasts.

Economic district	Regions included into it
Eastern	Kharkivska, Poltavska, Sumska Oblasts
Donetsky	Donetska, Luganska Oblasts
Prydnirpovsky	Dnipropetrovska, Zaporozhska, Kirovogradska Oblasts
Prychornomorsky	Autonomous Republic Crimea, Odeska, Mykolaivska, Khersonska Oblasts, city of Sevastopol
Podilsky	Vinnytska, Khmelnytska, Ternopilska Oblasts
Central	Kyivska, Cherkaska Oblasts
Carpathian	Zakarpatska, Ivano-Frankivska, Lvivska, Chernivetska Oblasts
Polisky	Volynska, Zhytomyrska, Rivnenska, Chernigivska Oblasts
city of Kyiv	city of Kyiv

Calculation of weight coefficients is conducted stage-by-stage and has a number of specific features.

The main steps of calculation are:

- establishing accordance between cost items of HLSS and representative commodities (services) of the consumer basket;
- de-aggregation and redistribution cost items of HLSS in accordance with the consumer basket and defining the detailed scheme of households' cost items distribution by the consumer basket items;
- correction of separate cost items of HLSS using additional data sources.

At the first stage, accordance between cost items of HLSS and representative commodities (services) of the consumer basket is set.

Most weight coefficients are calculated on the basis of HLSS data by direct attributing of spendings to the proper representative commodities (services).

For example, spendings of households on the item "Poultry Meat" is fully related to the item "Poultry" from the consumer basket.

The method of conditional inclusion is applied to insignificant spendings of households on commodities (services) not included into the consumer basket. Such spendings are attributed to spendings on representative commodities (services) close by their consumer properties and included into the consumer basket. This method is based on the assumption that the price of commodities with insignificant spendings changes proportionally to price change of similar commodities from the consumer basket.

For example, spendings on black caviar are very insignificant and when forming weight coefficients they are added to spendings on fish caviar; when defining weight coefficients on bags, spendings on purses are added, etc.

Consumer spendings of households by separate articles can be represented by aggregated data by groups of commodities and services, that is why at the second stage de-aggregation and redistribution of households' spendings is carried out for the purpose of receiving the weight coefficient for each commodity (service).

In the case when only one cost item corresponds to several items from the consumer basket, the de-aggregation method used. Thus, spendings are distributed in an expert way taking into account additional data sources, namely: volumes of the commodity's sales in city markets based on trade statistics data.

For example, in the consumer basket "carrot" and "beet" are separate representative commodities, while in HLSS this is one cost item. As based on data of trade statistics 60% of the commodity turnover is covered by carrot, 40% - by beet, spendings are distributed respectively.

In the structure of consumer monetary spendings of households in composition of separate groups together with detailed cost items there are not detailed, or "other" ones, which do not have the proper items in the consumer set of representative commodities (services). Distribution of such spendings can be conducted in a number of different ways.

Thus, for example, distributions of spendings of "Other medicines" and "Medicinal herbs" is carried out proportionally to the part of spendings on different types of medicines included into the consumer basket of representative commodities (services).

A tentative example of spendings distribution for items "Other medicines" and "Medical herbs"

	Consumer monetary spendings on average per 100 households, UAH	Part of spendings for the commodities included into the consumer basket	Distribution of spendings	Estimated consumption spendings, UAH	Estimated part of spendings used for calculation of CPI*

	1	2	3	4=1+3	5
1. Antibiotics	721.02	0.07	$3855.24 \times 0.07 = 269.87$	990.89	0.07
2. Vitamins	1412.60	0.13	$3855.24 \times 0.13 = 501.18$	1913.78	0.13
3. Vasodilators	6106.57	0.56	$3855.24 \times 0.56 = 2158.93$	8265.50	0.56
4. Hormonal preparations	824.02	0.08	$3855.24 \times 0.08 = 308.42$	1132.44	0.08
5. Febrifuge and anesthetic preparations	485.58	0.04	$3855.24 \times 0.04 = 154.21$	639.79	0.04
6. Ointments	1309.60	0.12	$3855.24 \times 0.12 = 462.63$	1772.23	0.12
7. Sum of spendings for commodities included into the consumer basket (sum of lines from 1 to 6)	10859.39	1		14714.63	
8. Medical herbs	309.01				
9. Other medicines	3546.23				
10. Sum of spendings for commodities not included into the consumer basket (line 8 + line 9)	3855.24				
11. Total sum of spendings on medicines (line 7 + line 10)	14714.63				

*Calculated by dividing lines 1-6 by line 7 column 4.

Some cost items of households from the "Miscellaneous" group are directly included into concrete representative commodities (services).

For example, households' spendings on item "Other types of butter" are included into the item "Dairy butter" from the consumer basket.

After accordance between HLSS cost items and representatives commodities (services) from the consumer basket is set, a detailed scheme of distribution of households; cost items on items of the representative commodities (services) basket for calculation of CPI is developed.

At the third phase, correction of separate cost items of households is carried out, as data about some purchases are not always completely reflected in cost items of HLSS because of their insignificant volume or because the purchases are made rarely. This can result in understating weight coefficients for these commodities and overstating others. Taking this into account, weight coefficients of separate representative commodities (services) are corrected on the basis of additional information obtained from other sources, in particular, retail trade statistics.

As practice testifies, there is traditional understating of households' spendings on alcoholic drinks, as respondents are inclined to hide actual costs of their purchase. That is why for the purpose of providing for their accordance with the level of actual consumption, correction of consumer spendings of the population on alcohol is carried out by means of increasing them and,

accordingly, increasing of total spendings. For this purpose, trade statistics data on volumes of retail commodity turnover of alcoholic drinks are used.

For example, the volume of retail commodity turnover of vodka in 2005 compared with 2004 increased by 15%, and spendings of households – by 5%. Households' spending on purchase of vodka and total spendings in 2005 are corrected by increasing them by 10%.

Consumer spendings of households on some commodities (services) can be substantial enough, however, it is very problematic to expressly define prices on them, in particular, because of low transparency in certain spheres.

This is true, *for example*, for rent of housing or tutors' services. In this case, the same methods of forming weight coefficients are used as for commodities with insignificant spendings, namely: their spendings are attributed respectively to apartment rent and secondary education.

A separate approach is applied when forming weight coefficients on the housing and communal component. In accordance with the concept of CPI construction, for determining the part of spendings on housing and communal services, the accrual method is used, as when using actually paid sums, the percentage of the services will be reduced (due to payment arrears), and that of commodities will increase in an unjustified way. Thus, weight coefficients for calculation of indices on housing and communal services are defined based on the indicator "charged for payment" after exclusion of the housing and communal services subsidy provided.

For example, the total sum of payment for housing and communal services makes up 100 UAH, while the household was provided with 20 UAH of cashless subsidy. Thus, the sum of payment in view of the subsidy provided makes up 80 UAH. It is this sum that is taken into account when forming the weight coefficient.

XI. Changing the Weights Structure

Replacement of the weight structure is conducted on the annual based on the standard procedure consisting of three steps.

At the first phase, update of weight coefficients of commodities (services) of the consumer basket is carried out.

Since the baseline period of the index is considered to be *December* of the previous year, and the baseline period of the weights structure – the *average annual* structure of consumer spendings of households for the previous year, for the purpose of providing for their comparability, weight coefficients of every representative commodity (services) are multiplied by the indicator defined by the ration of the long-term price index of December to the average annual index of the previous year.

Normalization of the updated weight coefficients, which is carried out by dividing every updated weight coefficient by the sum of all updated weight

coefficients, is the next step. As a result, the sum of all weight coefficients equals 1.0 or 100%.

Updated normalized weight coefficients meet those of December of the previous year (new index base).

At the second phase, calculation of long-term indices is carried out.

Calculations of CPI based on the new weights structure start from June of the current year. For the purpose of providing for continuity of dynamic ranges of indices for every representative commodity (service), long-term price indices for the period from December of the previous year till May of the financial year are calculated. These indices are used for calculation of the index in June of the financial year taking into account the period between the base of December previous year=100 and May of the financial year, which is the linkage month for the new index.

Due to this procedure, the dynamic range is transferred on the new base, and replacement of the weights structure does not impact the size of its indicators.

The third step is linking the "new" and "old" ranges of indices.

At this stage, linkage (connection) of every range of the "old" CPI with every range of the "new" CPI in June of the financial year is carried out applying correction coefficients reflecting the difference in levels of the "new" and "old" indices in May of the financial year.

Linkage of the "old" index with the "new" one is conducted in the following sequence:

- long-term indices of the linkage month are calculated for all groups and sub-groups in the "new" range of indices;
- coefficients used for correction of the level of indices calculated based on the updated weights structure to the level of indices calculated based on "old" structure for May of the financial year are calculated;
- indices calculated using the updated weights structure are multiplied by correction coefficients.

The correction process brings each range of "new" indices of May of the financial year to the level comparable with the level of the "old" range of indices.

XII. Calculation of Mean Prices and Individual Price Indices at the Regional Level

Calculations of mean prices and individual price indices at the regional level consist of two steps.

The first step includes calculation of mean prices on every commodity (services) in every urban settlement for the reporting period and previous months

on the basis of comparable prices registered at the same baseline enterprise on the same commodity in quality.

The mean price is calculated based on the formula:

$$\bar{p} = \sum p / n ,$$

where:

$\sum p$ – sum of comparable prices;

n – number of comparable prices.

On the basis of the calculated mean prices, directly in registration forms the individual prices index on every representative commodity (service) is calculated (within 0.0001) based on the formula:

$$i_p = \bar{p}_t / \bar{p}_{t-1} ,$$

where:

\bar{p}_t – mean price of the reporting month;

\bar{p}_{t-1} – mean price of the previous month.

Middle prices in every urban settlement on every representative commodity (service) and their individual indices are submitted to head administrations of statistics in AR Crimea, Oblasts, the city of Kyiv and the Statistics Department in the city of Sevastopol.

At the second stage, mean prices by regions are defined for the reporting and previous months on the basis of mean prices on every representative commodity (service) obtained from urban settlements as the weighted arithmetic average. The weighing base is the percentage of the average annual number of available population of the districts and cities where registration is conducted in the total population number in the region.

Thus, the mean price for a region on every representative commodity (service) is calculated based on the formula:

$$\bar{p}_i = \frac{\sum p_i \times d_i}{\sum d_i}$$

where:

P_i – price in the commodity (service) in the urban settlement;

d_i - percentage of the number of the district's, city's population in the total population of the region.

For example, an oblast center, another city and 2 rayon centers are surveyed in a region:

Name of representative commodities (services)	Name of urban settlements								Mean price for the region, UAH.		Prices index, %
	Oblast center		City A		Rayon center No.1		Rayon center No.2				
	Percentage of population (%)										
	44.5		10.5		19.2		25.8				
	Mean price (UAH.)										
	prev ious	repo rting	prev ious	repo rting	prev ious	repo rting	prev ious	repo rting	previo us	reporti ng	
	1	2	3	4	5	6	7	8	9	10	
rice	3.71	3.76	3.80	3.83	3.52	3.58	3.65	3.69	3.67	3.71	101.1
sunflower oil	5.82	5.95	5.73	5.78	5.90	5.92	5.71	5.78	5.80	5.88	101.4

Mean price on rice:

In the previous month $\bar{P}_{t-1} = \frac{3,71 \times 44,5 + 3,80 \times 10,5 + 3,52 \times 19,2 + 3,65 \times 25,8}{44,5 + 10,5 + 19,2 + 25,8} = \frac{366,75}{100} = 3,67 \text{ UAH.}$

In the reporting month

$\bar{P}_t = \frac{3,76 \times 44,5 + 3,83 \times 10,5 + 3,58 \times 19,2 + 3,69 \times 25,8}{44,5 + 10,5 + 19,2 + 25,8} = \frac{371,47}{100} = 3,71 \text{ UAH.}$

Mean price on sunflower oil:

In the previous month $\bar{P}_{t-1} = \frac{5,82 \times 44,5 + 5,73 \times 10,5 + 5,90 \times 19,2 + 5,71 \times 25,8}{44,5 + 10,5 + 19,2 + 25,8} = \frac{579,75}{100} = 5,80 \text{ UAH.}$

In the reporting month

$\bar{P}_t = \frac{5,95 \times 44,5 + 5,78 \times 10,5 + 5,92 \times 19,2 + 5,78 \times 25,8}{44,5 + 10,5 + 19,2 + 25,8} = \frac{588,25}{100} = 5,88 \text{ UAH.}$

Prices indices by regions are calculated by dividing the mean price of the reporting month by the mean price of the previous month.

In this example, the prices index on rice makes up:

$$3.71 : 3.67 \times 100 = 101.1\%;$$

on sunflower oil -

$$5.88 : 5.80 \times 100 = 101.4\%.$$

Prices indices and mean prices of the reporting month on every representative commodity (service) by regions is the foundation for CPI calculation for Ukraine and for regions.

XIII. Calculation of Consumer Prices Indices for Ukraine and by Regions

CPI calculations are carried out according to the modified Laysperse formula :

$$I_{t/t-1} = \sum [W_{j,o} \times \frac{i_{j,t/0}}{i_{j,t-1/0}}],$$

where:

$I_{t/t-1}$ – prices index of the reporting month to the previous one;

$W_{j,0}$ – percentage of spendings on representative commodity (service) (j) in the baseline period (o);

$i_{j,t/0}$ – long-term prices index on representative commodity (service) (j) of the reporting period (t) compared with the baseline one (o);

$i_{j,t-1/0}$ – long-term prices index on representative commodity (service) (j) of the previous period (t) compared with the baseline one (o);

This formula is more universal compared with the standard Laysperse formula as the continuous chain of calculations is used in it.

Calculations of CPI per quarter, the period from the beginning of the year, etc. are defined by the "chain" method, i.e. by multiplying monthly (quarterly, etc.) consumer prices indices.

Calculations of CPI are conducted using of Microsoft Excel application consisting of three tables B, C, D:

I. Table B. This table allows calculating consumer prices indices by regions.

Table B consists of three matrices:

1) calculations of indices on every commodity (service);

2) calculations of indices by every group and the general index based on the international Classification of Individual Consumption based on purposes (KCPI);

3) calculations of indices for every group and the general index based on the national Classification of Types of Economic Activity (CTEA).

II. Table C. This table allows aggregating 27 indices of the regional level to the national one.

Table C consists of three matrices:

1) calculation of long-term consumer prices indices on every commodity (service);

2) calculation of long-term consumer prices indices on every group and the general index based on KCPI;

3) calculations of long-term consumer prices indices on every group and the general index based on CTEA.

III. Table D. This table contains dynamic ranges of consumer prices indices of the national level for previous periods by commodity (service), group and the general index. The correlation of long-term indices of the reporting month and the previous one offers the percentage change by commodity (service), group and the general index, which is the indication of growth (reduction) of consumer prices (tariffs) for the reporting month.

XIV. Calculation of Consumer Prices Indices for Various Baseline Periods

CPI calculations are conducted monthly.

Monthly, apart from the prices index to the previous month, price indices prices to December of the previous year and to the proper month of the previous year are calculated. For recalculation of macroeconomic indicators within prices comparison, calculation of prices indices to the proper period of the previous year is carried out.

For calculation of the indices indicated, the following formulas are used:

to December of the previous year:

$$I_{\frac{t}{0}} = \frac{I_{\frac{t-1}{0}} \times I_{\frac{t}{t-1}}}{100}, (1)$$

where:

$I_{\frac{t-1}{0}}$ – prices index of the previous month to December of the previous year.

to the respective month of the previous year:

$$I_{\frac{tT}{t(T-1)}} = \frac{I_{\frac{0(T-1)}{0(T-2)}} \times I_{\frac{tT}{0(T-1)}}}{I_{\frac{t(T-1)}{0(T-2)}}}, (2)$$

where:

T – current year;

$T - 1$ – previous year;

$T - 2$ – year before the previous one;

$I_{\frac{0(T-1)}{0(T-2)}}$ – prices index of December of the previous year to December of the year before the previous one;

$I_{\frac{tT}{0(T-1)}}$ – prices index of the reporting month to December of the previous year ;

$I_{\frac{t(T-1)}{0(T-2)}}$ – prices index of the respective month of the previous year to December of the year before the previous one.

to the respective period of the previous year:

$$I_{\frac{T}{T-1}} = \frac{\sum_1^n I_{\frac{tT}{0(T-2)}}}{\sum_1^n I_{\frac{t(T-1)}{0(T-2)}}} \times 100, (3)$$

where:

n – number of months constituting the period;

$I_{\frac{tT}{0(T-2)}}$ – prices index of months of the current year to December of the year before the previous one;

$I_{\frac{t(T-1)}{0(T-2)}}$ – prices index of the respective months of the previous year to December of the year before the previous one.

On the quarterly basis, prices indices as on the end of quarter are defined as to the previous quarter, to the respective quarter of the previous year, to the previous year.

For calculation of the indices indicated, the following formulas are used:

end of the current quarter to the end of the previous quarter of the current year:

$$I_{KT} = \frac{I_{t/t-1} \times I_{t-1/t-2} \times I_{t-2/t-3}}{100}, (4)$$

where:

- $I_{t/t-1}$ – prices index of the last month of the reporting quarter to the previous month;
- $I_{t-1/t-2}$ – prices index of the middle month of the reporting quarter to the previous month;
- $I_{t-2/t-3}$ – prices index of the first month of the reporting quarter to the previous month;
- t – reporting month (last month) of the reporting quarter;
- $t-1$ – middle month of the reporting quarter;
- $t-2$ – first month of the reporting quarter;
- $t-3$ – last month of the quarter before the reporting one.

reporting quarter to the previous quarter of the current year:

$$I_{KT/(K-1)T} = \frac{I_{t/0(T-1)} + I_{t-1/0(T-1)} + I_{t-2/0(T-1)}}{I_{t-3/0(T-1)} + I_{t-4/0(T-1)} + I_{t-5/0(T-1)}} \times 100, (5)$$

де:

- $I_{t/0(T-1)}$ – prices index of the last month of the reporting quarter to December of the previous year;
- $I_{t-1/0(T-1)}$ – prices index of the middle month of the reporting quarter to December of the previous year;
- $I_{t-2/0(T-1)}$ – prices index of the first month of the reporting quarter to December of the previous year;
- $I_{t-3/0(T-1)}$ – prices index of the last month of the previous quarter to December of the previous year;
- $I_{t-4/0(T-1)}$ – prices index of the middle month of the previous quarter to December of the previous year;
- $I_{t-5/0(T-1)}$ – prices index of the first month of the previous quarter to December of the previous year;

reporting quarter to the respective quarter of the previous year:

calculated based of formula (3).

reporting quarter to the previous year:

$$I_{\frac{KT}{G(T-1)}} = \frac{(I_{\frac{tT}{0(T-2)}} + I_{\frac{(t-1)T}{0(T-2)}} + I_{\frac{(t-2)T}{0(T-2)}}) / 3}{\sum_{t=1}^{12} I_{\frac{t(T-1)}{0(T-2)}} / 12} \times 100, (6)$$

where:

- $I_{\frac{tT}{0(T-2)}}$ – prices index of the last month of the reporting quarter to December of the year before the previous one;
- $I_{\frac{(t-1)T}{0(T-2)}}$ – prices index of the middle month of the reporting quarter to December of the year before the previous one;
- $I_{\frac{(t-2)T}{0(T-2)}}$ – prices index of the first month of the reporting quarter to December of the year before the previous one;
- $I_{\frac{t(T-1)}{0(T-2)}}$ – prices index of the first,, twelfth months of the previous year to December of the year before the previous one.

In publications and official communications, data on consumer prices indices are indicate with one decimal place.

XV. Checking Data Authenticity

Information on consumer prices (tariffs) collected in the process of registration is the basis for calculation of the consumer prices index and requires a number of control measures for the purpose of providing for its proper quality and authenticity.

Employees of territorial state statistics bodies on the permanent basis carry out control of correctness of registration by means of regular audits of registration forms for consumer goods (services) prices obtained from urban settlements. The control includes the following components:

- timeliness of filling in the forms in accordance with registration terms;
- entering into the forms of all necessary data in accordance with methodological provisions;
- confirmation of an unusual or significant change in price;
- presence, in the case of need, of calculations per standard unit;
- replacement of commodities in accordance with methodological provisions.

Based on results of the control, all necessary corrections are made in registration forms before completion of calculations of individual prices indices for the reporting month for a region. At the same time, control results can be the foundation for additional individual instructing of separate recorders or targeted

control of their work. Such control is carried out by a direct visit into the urban settlement, where employees of territorial state statistics bodies together with recorders visit trade, services enterprises and markets for the purpose of verification of the prices (tariffs) registration procedure on the selected commodities (services).

Another activity of control over the process of prices registration is retrospective selective inspections by the staff of the central office.

Retrospective inspections are carried out and are used for:

- evaluations of the competence level of separate recorders;
- inspections of observing the procedure of data collection;
- determination of general needs for preparing recorders;
- review of all important and problematic issues;
- defining the regions where registration is connected with certain difficulties.

The method of retrospective inspections consists in visiting the baseline enterprise for a repeated registration of prices and control of the respective data, such as, for example, descriptions of commodities.

XVI. Classifiers Used for Calculation of the Consumer Prices Index

Calculations of the consumer prices index are conducted based on the international Classification of Individual Consumption by purposes (KCPI) and the national Classification of Types of Economic Activity (CTEA). Development of consumer prices indices based on different classifications is carried out on the base of the same data about prices on goods and services, and, thus, the result of calculations is an identical value of the aggregated index.

KCPI is one of four functional classifications described in the System of National Accounts 1993.

KCPI consists of 14 sections:

- sections from 01 to 12 cover spendings on final consumption of households;
- section 13 covers spendings on final consumption of non-commercial organizations of households;
- section 14 covers individual consumption spendings of the state governance sector.

KCPI has four levels of details:

- chapter, or the two-digit code level, e.g.: 01. Food products and soft drinks;
- group, or the three-digit code level, e.g.: 01.1 Food products;
- class, or the four-digit code level, e.g.: 01.1.1 Bakery and cereals;
- category, or the five-digit code level, , e.g.: 01.1.1.3 Macaroni products.

Classes in KCPI are distributed by the commodity type: services (S), short-term use commodities (S), medium-term use commodities (M) and long-term use commodities (L). If a class simultaneously contains commodities and services, short-term and medium-term use commodities, or medium-term and long-term use commodities, such class is marked in accordance with the dominant type of products.

Discrepancies between short-term and long-term use commodities are founded on whether commodities can be used only once or they can be reused during a period significantly exceeding one year. Long-term use commodities have a relatively high cost. Medium-term use commodities differ from long-term use commodities because although the term of their service may exceed one year, actually it is considerably shorter, and their cost is significantly lower.

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Consumer basket of representative commodities (services)

- 1 Rice
- 2 Wheat bread from the highest sort flour
- 3 Wheat bread from the first sort flour
- 4 Rye bread, rye and wheat bread
- 5 Baton
- 6 Bakery products
- 7 Rolls
- 8 Waffles
- 9 Biscuits
- 10 Macaroni
- 11 Vermicelli
- 12 Meat dumplings
- 13 Cakes
- 14 Wheat flour
- 15 Semolina cereals
- 16 Buckwheat cereals
- 17 Corn flakes
- 18 Pearled barley, barley cereals
- 19 Millet
- 20 Beef
- 21 Beef steak
- 22 Pork
- 23 Pork steak
- 24 Poultry
- 25 Ready-to-cook chicken food
- 26 Beef subproducts
- 27 Pork subproducts
- 28 Chicken subproducts
- 29 Boiled sausage
- 30 Sausages, small sausages
- 31 Smoked sausage
- 32 Uncooked smoked sausage
- 33 Boiled smoked meat products
- 34 Delicacy meat products
- 35 Meat mince
- 36 Canned meat
- 37 Fresh fish, cooled
- 38 Frozen fish
- 39 Filet of frozen fish
- 40 Sea-food
- 41 Salted, smoked sprat, capelin
- 42 Salted, smoked hardhead
- 43 Herring
- 44 Canned fish in oil
- 45 Canned fish in tomato
- 46 Canned delicacies

- 47 Fish caviar
- 48 Crab sticks
- 49 Milk
- 50 Curdled milk
- 51 Sour dairy products
- 52 Yogurt
- 53 Hard cheeses
- 54 Melted cheese, feta cheese
- 55 Soft cheeses
- 56 Curdled cheese, curdled cheese mass
- 57 Sour cream
- 58 Cream
- 59 Milk mixes for child nutrition
- 60 Eggs
- 61 Butter
- 62 Margarine
- 63 Sunflower oil
- 64 Fat
- 65 Adipose
- 66 Citruses
- 67 Bananas
- 68 Apples
- 69 Drupaceous fruit
- 70 Berries
- 71 Grapes
- 72 Water-melons, melons
- 73 Nuts
- 74 Dried fruit
- 75 Green head cabbage
- 76 Open ground cucumbers
- 77 Close ground cucumbers
- 78 Open ground tomatoes
- 79 Close ground tomatoes
- 80 Marrow, egg-plants, pumpkins
- 81 Pepper
- 82 Beans
- 83 Onion
- 84 Beet
- 85 Carrot
- 86 Mushrooms
- 87 Pickles
- 88 Pickled mushrooms
- 89 Sauce, tomato paste
- 90 Potato
- 91 Sugar
- 92 Jam, comfiture
- 93 Honey
- 94 Chocolate
- 95 Chocolates
- 96 Caramel

- 97 Marmalade, zephyr, halva
- 98 Chewing-gum
- 99 Ice-cream
- 100 Tomato ketchup
- 101 Mayonnaise
- 102 Vinegar
- 103 Salt
- 104 Garlic
- 105 Spices
- 106 Soups, broth blocks
- 107 Coffee beans, ground coffee
- 108 Instant coffee
- 109 Tea
- 110 Cacao
- 111 Mineral water
- 112 Soft drinks
- 113 Fruit and berry juices
- 114 Vodka
- 115 Cognac
- 116 Table wines
- 117 Strong wines
- 118 Champagne
- 119 Beer
- 120 Filter cigarettes
- 121 Cigarettes without filter
- 122 Fabrics
- 123 Male jacket
- 124 Male suit
- 125 Male trousers
- 126 Male jeans
- 127 Male shirt
- 128 Male sweater, jumper
- 129 Male jumpsuit
- 130 Male T-shirt, undershirt
- 131 Male trunks
- 132 Male bathing trunks
- 133 Male socks
- 134 Female overcoat, car coat
- 135 Female jacket
- 136 Female suit, dress suit
- 137 Female dressing-gown
- 138 Female trousers
- 139 Female jeans
- 140 Female blouse
- 141 Female skirt
- 142 Female sweater, jumper
- 143 Female jumpsuit
- 144 Female T-shirt, undershirt
- 145 Female trunks, pantaloons
- 146 Brassiere

147 Female swimming suit
148 Female tights
149 Natural fur products
150 Child jacket
151 Child one-piece
152 Child suit
153 Child shirt
154 Child trousers
155 Child jeans
156 Child sweater, jumper
157 Child jumpsuit
158 Child T-shirt, undershirt
159 Child trunks
160 Child tights
161 Head-dresses
162 Dry-cleaning
163 Male heat-insulated boots
164 Male boots, not heat-insulated
165 Male shoes
166 Male trainers
167 Male slippers
168 Female heat-insulated knee-boots, low shoes
169 Female knee-boots, low shoes, not heat-insulated
170 Female shoes
171 Female summer shoes
172 Female trainers
173 Female slippers
174 Child heat-insulated knee-boots, low shoes, boots
175 Child knee-boots, low shoes, boots, not heat-insulated
176 Child shoes
177 Child summer shoes
178 Child trainers
179 Child slippers
180 Shoe repair
181 Dormitories
182 Apartment rent
183 Details and constructions
184 Paint
185 Sanitary and technical equipment
186 Ceramic tiles
187 Wallpapers
188 Housing repair
189 Sewage
190 Cold water
191 Electric power
192 Natural gas
193 Condensed gas
194 Coal
195 Central heating
196 Hot water

197 Kitchen furniture
198 Wardrobe
199 Soft furniture
200 Lamp
201 Carpets, carpet products
202 Linoleum
203 Window shades
204 Blankets
205 Bed linen
206 Refrigerator
207 Washing-machine
208 Microwave
209 Heater
210 Vacuum cleaner
211 Small electric equipment
212 Iron
213 Repair of electrical household equipment
214 White-ware crockery
215 Metal crockery
216 Electric lamp
217 Household soap
218 Synthetic detergents
219 Antibiotics
220 Vitamins
221 Vasodilators
222 Hormonal preparations
223 Febrifuge and anesthetic preparations
224 Ointments
225 Adhesive plasters
226 Frames
227 Consulting services
228 Dentistry services
229 Diagnostic services
230 Services of sanatoriums and resorts
231 Passenger cars
232 Bicycles
233 Repair parts
234 Petrol
235 Technical servicing and repair of cars
236 Individual transport parking lot
237 Shuttle train
238 Intercity train
239 Shuttle bus
240 Intercity bus
241 City bus
242 Taxi
243 Air trips
244 Postal service
245 Telephone
246 Mobile phone

247 Intercity telephone communication
248 Subscriber pay for using the telephone
249 Mobile communication
250 Internet
251 Music center
252 Colored TV
253 DVD player
254 Camera
255 Processors
256 Monitors
257 Disks
258 Toys
259 Fresh flowers
260 Pet-food
261 Sports classes
262 Movies
263 Cable TV
264 Photo services
265 Books
266 Newspapers
267 Magazines
268 Notebook
269 Pen
270 Tourism and excursion services
271 Kindergartens
272 Secondary educational facilities
273 Higher educational facilities
274 Training courses
275 Restaurant
276 Cafe
277 Bar
278 Fast foods
279 Hotels
280 Resort hotels
281 Saunas
282 Hairdresser services
283 Toilet soap
284 Shampoo
285 Tooth-paste
286 Cream
287 Perfumery
288 Make-up
289 Toilet paper
290 Hygiene products
291 Golden jewelry
292 Bags
293 Financial services
294 Notary services
295 Registration of official event
296 Ritual services

List of urban settlements in which surveillance over consumer prices changes is conducted

Region	Urban settlements in which surveillance over consumer prices changes is conducted
Autonomous Republic Crimea	Bilogorsk Dzhankoy Yevpatoriya Kerch Krasnoperekopsk Feodosia Simferopol Yalta
Vinnytska	Vinnytsya Kozyatyn Khmilnyk
Volynska	Lutsk Volodymyr-Volynsky Kovel Novovolynsk Rozhysche
Dnipropetrovska	Dnipropetrovsk Kryvy Rig Dniprodzerzhynsk Novomoskovsk Zhovti Vody Marganets Synelnykove Solone town
Donetska	Donetsk Mariupol Kramatorsk Slovyansk Dobropillya Volnovaha Amvrosiivka
Zhytomyrska	Zhytomyr Berdychiv Korosten Novograd-Volynsky Korostyshiv Ovruch
Zakarpatska	Uzhgorod Mukachevo Hust Svalyava
Zaporizska	Zaporizhya Berdyansk Melitopol Orihiv

Continued

Region	Urban settlements in which surveillance over consumer prices changes is conducted
	Pology Tokmak
Ivano-Frankivska	Ivano-Frankivsk Dolyna Kalush Kolomyia Nadvirna
Kyivska	Bila Tserkva Boryspil Brovary Vasylkiv Irpın Makariv Fastiv
Kirovogradska	Kirovograd Znamyanka Mala Vyska Oleksandria Svitlovodsk
Luganska	Lugansk Alchevsk Antratsyt Kreminna Lysychansk Lutugyne Rovenky Severodonetsk Starobilsk Stahanov
Lvivska	Lviv Drogobych Chervonograd Sokal Stryi Yavoriv Radehiv
Mykolaivska	Mykolaiv Voznesensk Ochakiv Pervomaysk
Odeska	Odesa Izmail Bilgorod-Dnistrovsky Illichivsk Kotovsk Artsyz
Poltavska	Poltava Kremenchuk Komsomolsk Lubny

Continued

Region	Urban settlements in which surveillance over consumer prices changes is conducted
	Myrgorod Pyryatyn
Rivnenska	Rivne Dubno Radyvyliv
Sumska	Sumy Gluhiv Konotop Krasnopillya town Ohtyrka Romny Shostka
Ternopilska	Ternopil Kremenets Borschiv
Kharkivska	Kharkiv Balakliya Izyum Zmiiv Kupyansk Lozova
Khersonska	Kherson N.Kahovka Kahovka Gola Prystan
Khmelnyska	Khmelnysky Kamyanets-Podilsky Slavuta Shepetivka Letychiv town
Cherkaska	Cherkasy Uman Smila Zvenygorodka Kaniv
Chernivetska	Chernivtsi Sokyryany Storozhynets
Chernigivska	Chernigiv Bahmach Kozelets Nizhyn Pryluky
city of Kyiv	city of Kyiv
city of Sevastopol	city of Sevastopol

List of commodities prices registration for which is conducted during the entire month

1. Beef
2. Pork
3. Poultry
4. Frozen fish
5. Sunflower oil
6. Milk
7. Eggs
8. Sugar
9. Wheat flour
10. Rye bread, rye and wheat bread
11. Rice
12. Buckwheat cereals
13. Macaroni
14. Petrol

Territory	_____	Code of territory	_____
Commodity (service)	_____	Commodity (service) code	_____
Commodity (service) unit	_____		

FORM OF REGISTRATION OF PRICES ON CONSUMER COMMODITIES (SERVICES)
For (month) 200

Item No.	Name of the trade, service enterprise (facility), market	Previous month					Current month				
		Registration date	Commodity (service) description	Pack volume, weight	Price (UAH per pack)	Price recalculated per unit*	Registration date	Commodity (service) description	Pack volume, weight	Price (UAH per pack)	Price recalculated per unit*
1	2	3	4	5	6	7	8	9	10	11	12

Trade, service enterprise (facility) of all forms of ownership (code A)

[illegible]

(Code A)	Calculation of the mean comparative price and the mean price index	Prices sum	_____ (UAH)	Prices sum	_____ (UAH)
		No. of prices	_____	No. of prices	_____
		Mean price	_____ (UAH)	Mean price	_____ (UAH)
		Mean price index (coefficient)		(within 0.0001)	

Markets (code B)

[illegible]

(Code B)	Calculation of the mean comparative price and the mean price indexy	Prices sum _____ (UAH)	Prices sum _____ (UAH)
		No. of prices _____	No. of prices _____
		Mean price _____ (UAH)	Mean price _____ (UAH)
		Mean price index (coefficient) _____ (within 0.0001)	

(Code A+B)	Calculation of the mean comparative price and the mean price indexy	Prices sum _____ (UAH)	Prices sum _____ (UAH)
	No. of prices _____	No. of prices _____	No. of prices _____
	Mean price _____ (UAH)	Mean price _____ (UAH)	Mean price _____ (UAH)
	Mean price index (coefficient) _____ (within 0.0001)		

* In sections 7 and 12 prices are shown recalculated per 1 kg, 1 l, conditional jar and prices on commodities not requiring recalculation.